

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

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NRC INFORMATION NOTICE No. 92-34: NEW EXPOSURE LIMITS FOR AIRBORNE URANIUM AND THORIUM

Addressees:

All licensees whose operations can cause airborne concentrations of uranium and thorium.

Purpose:

The U.S. Nuclear Regulatory Commission is issuing this information notice to alert addressees of changes, in 10 CFR Part 20, governing airborne uranium and thorium exposures that may significantly affect exposure calculations and reporting requirements. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid violations of the new Part 20. However, suggestions contained in this information notice are not new NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

The major revision of 10 CFR Part 20 was published on May 21, 1991 (56 FR 23360). This revision adopted the dose-assessment methodology recommended by the International Commission on Radiation Protection (ICRP). The new methodology significantly changes the occupational exposure limits for airborne uranium and thorium compounds. The current regulation requires licensees to implement the new Part 20 by January 1, 1993. However, licensees should note that the Commission is proposing to extend the implementation date to January 1, 1994.

Discussion:

Because NRC has adopted the dose-assessment methodology of ICRP 26 and 30, the new Part 20 contains two changes that can impact greatly on licensees that experience airborne concentrations of uranium and thorium compounds. These are changes in occupational exposure limits, and equivalence of internal and external dose.

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As shown in the table below, the new Part 20 includes a reduction in occupational airborne concentrations of certain thorium and uranium compounds. However, the allowed concentrations of other nuclides have been relaxed. Although most changes have been made to reflect radiological concern, 10 CFR 20.1201 (e) limits intakes of soluble uranium to 10 milligrams in a week, in consideration of chemical toxicity, which is likely to be controlling at enrichments of 5 percent or less.

Table 1: Old versus New Occupational Exposure Limits

Compound	Old Part 20 Appendix B, Table I, Col. 1	New Part 20 Appendix B, Table I, Col. 3
Th-234, class W	6E-8 $\mu\text{Ci/ml}$	8E-8 $\mu\text{Ci/ml}$
Th-234, class Y	3E-8 $\mu\text{Ci/ml}$	6E-8 $\mu\text{Ci/ml}$
Th-232, class W	3E-11 $\mu\text{Ci/ml}$	5E-13 $\mu\text{Ci/ml}$
Th-232, class Y	3E-11 $\mu\text{Ci/ml}$	1E-12 $\mu\text{Ci/ml}$
Th-231	1E-6 $\mu\text{Ci/ml}$	3E-6 $\mu\text{Ci/ml}$
Th-230, class W	2E-12 $\mu\text{Ci/ml}$	3E-12 $\mu\text{Ci/ml}$
Th-230, class Y	1E-11 $\mu\text{Ci/ml}$	6E-12 $\mu\text{Ci/ml}$
Th-228, class W	9E-12 $\mu\text{Ci/ml}$	4E-12 $\mu\text{Ci/ml}$
Th-228, class Y	6E-12 $\mu\text{Ci/ml}$	7E-12 $\mu\text{Ci/ml}$
Th-227	2E-10 $\mu\text{Ci/ml}$	1E-10 $\mu\text{Ci/ml}$
U-238, class D	7E-11 $\mu\text{Ci/ml}$	6E-10 $\mu\text{Ci/ml}$
U-238, class Y	1E-10 $\mu\text{Ci/ml}$	2E-11 $\mu\text{Ci/ml}$
U-235, class D	5E-10 $\mu\text{Ci/ml}$	6E-10 $\mu\text{Ci/ml}$
U-235, class Y	1E-10 $\mu\text{Ci/ml}$	2E-11 $\mu\text{Ci/ml}$
U-234, class D	6E-10 $\mu\text{Ci/ml}$	5E-10 $\mu\text{Ci/ml}$
U-234, class Y	1E-10 $\mu\text{Ci/ml}$	2E-11 $\mu\text{Ci/ml}$

The relative equivalence of internal and external dose means that exposures to airborne concentrations of radioactive particles must now be maintained as part of a worker's total occupational dose limit (10 CFR 20.1202). Under the old Part 20, internal and external doses had separate limits and were not combined. Section 20.1204 states, further, that internal exposure can be determined through air sampling in the work place or routine bioassay.

If air sampling is chosen as the most accurate means of tracking dose, compliance with the new limits may be demonstrated through precise solubility, isotopic, and particle-size classifications, pursuant to Appendix B to 10 CFR 20.1001-20.2401.

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
92-33	Increased Instrument Response Time When Pressure Dampening Devices are Installed	04/30/92	All holders of OLs or CPs for nuclear power reactors.
92-32	Problems Identified with Emergency Ventilation Systems for Near-Site (Within 10 Miles) Emer- gency Operations Facili- ties and Technical Support Centers	04/29/92	All holders of OLs or CPs for nuclear power reactors.
92-31	Electrical Connection Problem in Johnson Yokogawa Corporation YS-80 Programmable Indi- cating Controllers	04/27/92	All holders of OLs or CPs for nuclear power reactors.
92-30	Falsification of Plant Records	04/23/92	All holders of OLs or CPs for nuclear power reactors and all licensed operators and senior operators.
92-21, Supp. 1	Spent Fuel Pool Re- activity Calculations	04/22/92	All holders of OLs or CPs for nuclear power reactors.
92-29	Potential Breaker Mis- coordination Caused by Instantaneous Trip Circuitry	04/17/92	All holders of OLs or CPs for nuclear power reactors.
92-28	Inadequate Fire Suppres- sion System Testing	04/08/92	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit