



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

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JUN 27 1990

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JUN 27 1990

OF PAGES 1 AND COVER SHEET

FROM

Jim Wigginton

PHONE EXT.

21058

~~Delet~~
Dr. Corl

pin telecon with AL. R. 7438-21

After further consideration and discussion, the consensus staff view/position is to delete the suggested reference to the OSHA respiratory protection regulations (29 CFR Part 1910.134).

The staff is aware that the existing OSHA regulations are based upon a 1969 ANSI standard, and since 1984 attempts by OSHA to update their regulations have been unsuccessful. Revised, consensus ANSI guidance in the respiratory area is imminent and the staff has recognized the need to use this industry ^{standard} ~~reference~~ and update the NRC regulations and guidance. The staff has recently started the updating process and feels that the OSHA reference is no longer needed. Any new proposed requirements in the respiratory area shall go through the normal process and benefit from public review and comment.

Tim Wigginton

12/05/99

1/27/00

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Memo For : List of Addressees

From : D Cool

SUBJECT : MINOR REVISIONS TO 10 CFR
PART 20 REVISION AND PREAMBLE

The enclosed Commission Rules
propose several minor
revisions to the 10 CFR Part 20
rule. It will be sent to the
Commission hopefully ~~next~~
during the 1st week in July.

I will appreciate your telephone
comments to me or Mr Peterson
by July 3.

At this needs to
be: 1. copied
(this is the original)
2. reviewed by
you and Don and
corrected if needed
3. Duplicated
and sent to:

1. Bill Morris
 2. Nick Castonzi
 3. Pat Thompson
 4. Dave Mappes OGC
 5. George Pangburn EDO
 6. RE Cunningham
 7. F Conzel
 8. Vandy Miller
- Thanks
D Cool

URGENT / AA38-2

Document Name:
PART 20 COMMISSION PAPER

Requestor's ID:
PETERSON

Author's Name:
PETERSON

Document Comments:

John

AA38-2

For: The Commissioners

From: James M. Taylor, Executive Director for Operations

Subject: MINOR REVISIONS TO 10 CFR PART 20 REVISION & PREAMBLE

Purpose: To get Commission approval on clarifications and additions to the final revised Part 20.

Category: Although the changes are relatively minor they relate to a major policy issue.

Summary: Several areas where modifications to the Part 20 rule in SECY-88-315 and SECY-89-267 are desirable or needed have been identified by the Commissioners or in discussions between staff and Commissioner's technical assistants. Enclosure A to this paper provides suggested text for these changes. Approval of this text or suggested changes can be noted in the Staff Requirement Memorandum (SRM) on SECY-88-315 and SECY-89-267. Other suggested changes where major new text was not required (e.g., word deletions or insertions) will be implemented as directed in the SRM. As per standard procedure, a marked-up copy of the final statement and rule which shows all of the changes from the version in SECY-88-315 will be provided with the final Federal Register Notice to the Office of the Secretary.

None of these changes is believed to generate an impact on either the NRC, the environment, or on licensed activities that would warrant any modification to the NRC implementation resource estimates, the environmental assessment, or regulatory analysis provided in SECY-88-315.

The most significant of these changes is to allow "black" in place of "magenta" or "purple" on a yellow background for the radiation warning symbols on signs, placards, and labels. As this is a permissive rather than a required change, there is no requirement for licensees to change and no

Contact: H.T. Peterson, Jr., RES
(49-23640)

The Commissioners

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significant economic impact associated with this change.
The rationale for this addition is in the suggested text
for modifying the preamble (See item # 1 in Enclosure A).

James M. Taylor
Executive Director
for Operations

Enclosure A: Recommended
Changes

AA382

Document Name:
CHANGES TO PART 20

Requestor's ID:
PETERSON

Author's Name:
Peterson

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ENCLOSURE A

RECOMMENDED CHANGES

[Changed wording in brackets & underscored]

1. MODIFY § 20.901 TO PERMIT THE USE OF BLACK AS AN ALTERNATE COLOR ON WARNING SIGNS (IN ADDITION TO MAGENTA AND PURPLE)

STATEMENT

Section 20.901 Caution Signs.

Comment: Black should be permitted as an acceptable color for the radiation warning symbol. Several commenters requested that the color black should also be allowed to be used on signs and for stenciling packages. The fading of magenta inks in sunlight and the use of black for marking international shipments were cited as supporting this position.

[Response: The Commission believes that, although the "magenta-on-yellow" color scheme has provided an unique warning of possible radiation hazards, black-on-yellow would also be acceptable. The fading of the magenta color as cited above may reduce the visibility of the sign with time. Because of the cost impacts if existing warning signs had to be replaced, the Commission is permitting the use of black in addition to continued approval of magenta and purple, rather than as a required replacement.

Final Rule. This section has been modified to add black as an acceptable color for the radiation warning symbol.]

MODIFY THE RULE (Enclosure 4 to SECY-88-315) AS FOLLOWS:

§ 20.901 Caution signs.

(a) Standard radiation symbol. Unless otherwise authorized by the Commission, the symbol prescribed by this part shall use the colors magenta, or purple, or black on a yellow background. The symbol prescribed by this part is the three-bladed design:

* * * * *

RADIATION SYMBOL

- (1) Cross-hatched area is to be magenta, or purple, or black; and
- (2) Background is to be yellow.

Paragraphs(b) and (c) are unchanged.

2. MODIFY § 20.906 TO CLARIFY "PACKAGE" SURVEY REQUIREMENT FOR SEALED SOURCES

Modify § 20.906 by inserting an exemption in a new paragraph (f) to remove the inadvertent requirement for well-loggers and radiographers having to perform smear tests on the transportation packages everytime they move their source to and from a work site. This requirement resulted from the removal in the proposed rule of exemptions in the current Part 20 that included exempting "special form [sealed] sources" from the package opening procedures. Staff does not believe that going back to the full exemption for sealed sources is desirable because of the possibility that a source can become dislodged from its shield or broken (in which case there may be a contamination as well as an external radiation problem). The proposed partial reinstatement does not require the contamination check as source breakage is more likely to be known if an event occurs in a licensee-owned or operated vehicle than in general commerce. X

Note that the proposed change is a relaxation of the requirement in the the proposed rule or in SECY-88-315, but is still more stringent than the present Part 20.

STATEMENT

Comment: The requirement to survey external surfaces of packages is unnecessary. Several commenters with extensive experience in monitoring packages noted that external contamination was rarely if ever present and that wipe tests are time-consuming both to make the smears and to count them.

Response: Experience in the shipment of thousands of packages each year has been very good. However, potential problems with leaking packages during transit warrant continued monitoring upon receipt to ensure that leaking packages are found and reported. Appropriate action can then be taken to determine the extent of contamination in transport vehicles and storage areas in order to limit the consequences and avoid recurrence. [However, an exemption from the contamination survey requirement has been provided for special form (sealed) sources that are being moved to and from work sites in licensee owned or operated vehicles. This partially restores a total exemption from the package surveys in the existing Part 20 (§ 20.205 (b)(iii)) for all special form sources. The Commission believes that restoring this exemption will not result in any additional hazard and notes that an external radiation survey of the source package is still required. The primary purpose of this external survey is to ensure that the source is still properly secured and shielded after transporting it.]

CHANGES TO RULE:

§ 20.906 Procedures for receiving and opening packages.

* * * * *

[(f) Licensees transferring special form sources in licensee-owned or licensee-operated vehicles to and from a work site are exempt from the contamination monitoring requirements of (b), but are not exempt from the survey requirement in (b) for measuring radiation levels which is required to ensure that the source is still properly lodged in its shield.]

3. MODIFY § 20.206 to conform more closely to definition of "planned special exposures" by removing "in excess of" and replacing with "in addition to and accounted for separately from the doses received under § 20.201 ..."

The definition of "Planned Special Exposure" from § 20.3 is:

"Planned special exposure" means an infrequent exposure to radiation, separate from and in addition to the annual dose limits."

§ 20.206 Planned special exposures

A licensee may authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under § 20.201 provided that each of the following conditions is satisfied--

* * * * *

4. MODIFY § 20.1003 (a) (3) (i) by two additions in order to improve specificity and clarity:

§ 20.1003 Disposal by release into sanitary sewerage.

(a)

* * * * *

(3) If more than one radionuclide is released, the following conditions must also be satisfied:

(i) The licensee shall determine the fraction [of the limit in Table 3 of Appendix B represented by discharges into sanitary sewerage] by dividing the actual monthly average concentration of each radionuclide released by the licensee into the sewer by the concentration of [that] radionuclide listed in Table 3 of Appendix B; and

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5. MODIFY THE STATEMENT (Encl. 3 to SECY-88-315) page 73 for § 20.1003 to stress the prohibition against disposal of insoluble materials into sanitary sewer systems.

After "Response" add:

Final Rule: The final rule permits disposal into sanitary sewers of: (1) radionuclides in soluble form or (2) radionuclides in readily dispersible biological material, provided that the limits in Appendix B, Table 3 on the average monthly concentrations and the limits in § 20.1003 (a)(4) on the total activity released annually are met. The revised rule no longer permits the disposal of non-biological insoluble materials because of potential reconcentration of these materials in the sanitary sewer system, sewage treatment plants, and sewage sludge. This prohibition is the reason why there are no values listed in Table 3 of Appendix B for insoluble materials.

6. MODIFY THE STATEMENT TO BETTER EXPLAIN THE RATIONALE FOR INCLUDING REFERENCE TO THE OSHA RESPIRATORY PROTECTION SECTION

Remove the current text discussing this issue and replace with

Section 20.704 Further Restrictions on the Use of Respiratory Protection
~~Equipment~~ *Equipment*

* * * * *

[Final Rule. The requirements contained in the proposed rule are retained. In addition, there is a requirement for licensees subject to the requirements of the Occupational Safety and Health Administration (OSHA) to comply with the OSHA requirements for respiratory protection. The purpose of adding this citation is to avoid NRC having to conduct separate rulemaking to adopt those portions of the OSHA regulations on respiratory protection that are not already reflected in Appendix A to Part 20 (e.g., prohibiting the use of respirators by bearded individuals). Most of the OSHA respiratory protection requirements already parallel those in Part 20 so there are only a few new requirements beyond those already in Part 20.

This addition does not add any burden on a licensee already subject to OSHA requirements, except that it does allow citation by NRC inspectors of violations against 29 CFR 1910.134 of the OSHA regulations. There is an existing Memorandum of Understanding between the Department of Labor, Occupational Safety and Health Administration, and the Nuclear Regulatory Commission (Federal Register of October 31, 1988, 53 FR 43950) that states in part that:

"6. ...Although the NRC does not conduct inspections of industrial safety, in the course of inspections of radiological and nuclear safety, NRC personnel may identify safety concerns within the area of OSHA responsibility or may receive complaints from an employee about OSHA-covered working conditions. In such instances NRC will bring the matter to the attention of licensee management. ... If significant safety concerns are identified or if the licensee demonstrates a pattern of unresponsiveness to identified concerns, the NRC Regional Office will inform the appropriate OSHA Regional Office. ..."]

7. UPDATE STATEMENT TO ADD DISCUSSIONS OF BEIR & UNSCEAR REPORTS;
MODIFY THE STATEMENT OF CONSIDERATIONS TO ADD IN SECTION II.:

F. The 1988 Report of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR-88).

The United Nations Scientific Committee on the Effects of Atomic Radiation has analyzed data on the sources and effects of atomic radiation and published a series of reports containing summaries of the sources of radiation, the doses received by workers and members of the general public from these sources, and an analysis of the potential health risks from exposure to ionizing radiation. The latest report in this series is the 1988 report. The 1988 report contains updated information on the health risks of ionizing radiation determined from a reevaluation of the data on the survivors of the Hiroshima-Nagasaki atomic bombings. Based upon these data, the radiation risk at high doses and high dose rates is estimated to be 7.1×10^{-4} fatal health effects per rad (0.071 effects per gray). For estimating the risk from radiation doses below 100 rem, the UNSCEAR report recommended that a dose rate reduction factor be applied to account for the reduced effectiveness of lower doses and lower dose rates delivered over longer periods of time (dose protraction). A range of between 2 and 10 was recommended for the magnitude of the dose reduction factor. This would lead to an estimated risk of fatality of between $(0.7 \text{ to } 3.5) \times 10^{-4}$ health effects per rem for low doses such as those encountered in routine occupational exposure and the even lower doses that might be received by members of the general public from NRC- (or Agreement State) licensed activities.

7 United Nations Scientific Committee on the Effects of Ionizing Radiation (UNSCEAR), "Sources, Effects and Risks of Ionizing Radiation," 1988 Report to the General Assembly, Sales Section, United Nations, N.Y. 10017 (1988).

The risk value associated with the 1977 ICRP recommendations¹, is 1.65×10^{-4} (the proposed Part 20 rule, 51 FR 1102, January 9, 1986) so that the risks per rem as estimated by the 1988-UNSCEAR report for low doses is between 0.43 to 4.7 times higher than the earlier ICRP estimate. The geometric mean of this range is 2 indicating that a central value for the newer risk estimate is about twice the earlier estimate associated with the 1977 ICRP report and Part 20. The implications of this increase are discussed in Section H below along with the results of the 1990 BEIR-V report.

G. The 1988 Report of the National Academy of Sciences' Committee on the Biological Effects of Ionizing Radiation (BEIR IV)⁸

The 1988 BEIR-IV report supplements the 1980 BEIR-III report by providing a more detailed analysis of the risks from internal alpha-emitting radionuclides to complement the emphasis of the BEIR-III report on gamma and beta radiation. Revised risk estimates are given for intakes of radon, radium, polonium, thorium, uranium, and higher transuranic elements (e.g., plutonium).

The radionuclide given the greatest emphasis in the BEIR-IV report is radon (radon-222), the gaseous decay product of radium-226. The radon dose conversion factor in

⁸ National Academy of Sciences-National Research Council, Committee on the Biological Effects of Ionizing Radiation, "Health Risks of Radon and other Internally Deposited Alpha-Emitter, (BEIR IV)," National Research Council, National Academy Press, Washington, D.C. 20418 (1988).

the BEIR-IV report for exposure conditions representative of those of the general public is consistent with the value used to derive the airborne effluent concentration limit for radon-222 in Appendix B, Table 2 of the revised 10 CFR Part 20.

H. The 1990 Report of the National Academy of Sciences' Committee on the Biological Effects of Ionizing Radiation (BEIR V)⁹

The BEIR-V report is another comprehensive re-evaluation of the health risks of radiation exposure based upon the revised dose estimates for the survivors of the atomic bombings of Hiroshima and Nagasaki. The BEIR-V report gives risk estimates for leukemia and non-leukemia (solid cancers) that are about three or four times higher than the estimates in the 1980 BEIR-III report. The BEIR V gives the following factors as the principal reasons for this increase: (1) use of different dose-response and risk projection models, (2) revised estimates of the doses to the individual survivors of the atomic bombings in Japan, and (3) additional years of followup studies since the BEIR-III was completed in 1980.

The primary projection model used in BEIR-V to extrapolate the cancer risk observed to date to future years uses a relative risk model in which the risk is assumed to be proportional to the natural cancer incidence. This results in the risk from radiation exposure being dependent upon both the time since the exposure occurred and the age of the person. Because of this dependence upon age, the relative risk model generally predicts higher future (lifetime) risks than the absolute risk model which employs a constant added risk per year with increasing age. Both the absolute and relative risk projection models had been used in the BEIR-I(1972) and BEIR-III reports, but until the BEIR-V report, the absolute model had been preferred.

Revised estimates of the doses to the survivors of the atomic bombings in Japan changes the cancer risk projections by about a factor of 3. However, estimates of thyroid cancer and genetic effects are derived from populations other than the Japanese atomic bomb survivors and are not affected by the dosimetry reevaluation.

9 National Academy of Sciences-National Research Council, Committee on the Biological Effects of Ionizing Radiation, "Health Effects of Exposure to Low Levels of Ionizing Radiation, (BEIR V)," National Research Council, National Academy Press, Washington, D.C. 20418 (1990).

The Commission does not believe that additional reductions in the dose limits are urgently required by the latest risk estimates contained in these studies. Only a few individuals in either the work force or in the general public are exposed at or near the limits, and most of these will not be exposed at such levels over long periods of time. Due to the practice of ALARA ("as low as is reasonably achievable"), the average radiation dose to occupationally-exposed individuals is far below the limits in either the existing or revised Part 20. As a result of the application of the ALARA philosophy to effluent release standards in Appendix 1 to 10 CFR Part 50 for nuclear power reactors and EPA's 40 CFR Part 190 for uranium fuel cycle, doses from effluents from fuel cycle facilities are generally much less than even the 0.1 rem per year standard in the revised Part 20.

^e
However, because of the long-term implications of these recent higher estimates of the risk from ionizing radiation, the NRC has initiated studies to evaluate the need for and impacts of possible additional reductions in the occupational dose limits. ~~Any such proposed changes would be announced for public comment as a proposed NRC rulemaking.~~ The NRC is also closely following the actions and recommendations of advisory bodies such as the National Council on Radiation Protection and Measurements, the International Commission on Radiological Protection, and the U.S. Committee on Radiation Research and Policy Coordination, and any additional Federal Radiation Guidance.

In addition the staff is developing an ANPR to solicit public comments and suggesting date regarding possible ways to approach future change in the dose limits based on the revised risk estimates.

7. Update Statement Section: III. [Issues Being Resolved Separately]

As noted in the above discussion, there are several areas where the Commission believes a better scientific consensus is needed before adopting values different from those in the present Part 20. There are several areas where issues raised in the public comments (see following Section V) are being resolved in other NRC rulemaking proceedings because of either their scope, complexity, or timing. The following issues are being or will be resolved in other NRC rulemaking proceedings:

(1) Establishment of "Below Regulatory Concern (BRC)" levels (related to de minimis levels and a negligible level of risk). [The Commission issued a policy statement on "Below Regulatory Concern" on June 27, 1990 (55 FR XXXXX). This policy statement sets forth the basis for future Commission actions regarding rulemaking and licensing actions related to Commission approval of the use of this concept.]

(2) Limits for decommissioning of nuclear facilities and for residual radioactive contamination. [This is being actively pursued by both the Commission staff and as part of an EPA Interagency Task Force on Residual Radioactivity.]

(3) Limits and calculational procedures for dealing with the "hot particle" issue (small particles found in nuclear reactors that, because of their small size, produce high localized doses to skin.) [A modified enforcement policy statement with regard to the "hot particle issue" is in the final stages of NRC and peer review.]

(4) Modification of NRC incident notification requirements. [A modification of the incident notification requirements was issued for public comment on May 14, 1990 (55 FR 19890).]

[(5) Publication of a separate rule for large irradiators. A new Part 36 is undergoing Commission review prior to publication as a proposed rule for public comment. The detailed requirements for irradiators presently in the revised Part 20 (§ 20.602) will eventually be deleted in favor of the provisions incorporated in the new Part 36.]

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8. MODIFY DISCUSSION OF BACKFIT ANALYSIS to add preface:

XII. Backfit Analysis

The Commission finds that the revisions to 10 CFR Part 20 provide a substantial increase in the overall protection of the public health and safety compared with the level of protection presently required by the existing Part 20 and that the direct and indirect costs of implementation are justified in view of the quantitative and qualitative benefits associated with the revisions. However, despite the increase in the protection afforded by the Part 20 revision, licensed facilities are presently providing adequate protection of public health and safety because they are generally operating at dose levels far below the requirements in the present Part 20 in accordance with the principle of ALARA. This principle is embodied in the provisions of the current Part 20 and implemented by licensees as good health physics practice.

* * * * *

Additional Instructions to be provided to staff in the Staff
Requirements Memorandum