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Enforcement Policy Regarding Occupational Doses from "Hot Particles;" Policy Statement.

AGENCY: Nuclear Regulatory Commission.

ACTION: Policy Statement.

SUMMARY: This policy statement presents the criteria the Commission will follow to provide for the use of enforcement discretion in cases that involve an occupational dose to the skin resulting from exposure to radiation emitted from a hot particle on or near the skin. The provisions of this policy will be followed by the NRC staff until a new limit applicable to such cases is established by a revision of 10 CFR Part 20.

EFFECTIVE DATE: July 30, 1990

FOR FURTHER INFORMATION CONTACT: James Lieberman, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D. C. 20555, Telephone (301) 492-0741.

SUPPLEMENTARY INFORMATION:

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### Purpose

The purpose of this policy statement is to explain the enforcement policy that the Commission intends to follow (notwithstanding the current enforcement policy in 10 CFR Part 2, Appendix C), regarding the use of enforcement discretion in cases that involve an occupational dose to the skin resulting from exposure to radiation emitted from a hot particle on or near the skin. The provisions of this policy will be followed by the NRC staff until a new limit applicable to such cases is established by revision of 10 CFR Part 20.

### Scope

This policy applies only to occupational doses to the skin that exceed the limits of 10 CFR 20.101 for the "hands and forearms, feet and ankles" or the "skin of the whole body" and that are the result of radiation emitted from a hot particle on the body or clothing of the exposed individual. This policy does not change criteria for whole-body doses.

### Definitions

As used in this policy --

"Beta emission" means either (1) the number of beta particles emitted from the radionuclide(s) in the hot particle during the time period of the occupational exposure to the skin or (2) the number of beta particles emitted from the surface of the particle during that time period.

"Hot particle" means a discrete radioactive fragment that is insoluble in water and is less than 1 mm in any dimension.

"Hot particle exposure" means an occupational dose to the skin resulting from exposure to radiation emitted from the radionuclides in a hot particle on the body or on the clothing of the exposed individual.

"Occupational dose" includes exposure of an individual to radiation (1) in a restricted area or (2) in the course of employment in which the individual's duties involve exposure to radiation, provided, that "occupational dose" shall not be deemed to include any exposure of an individual to radiation for the purpose of medical diagnosis or medical therapy of such individual. (Note: This is the definition of this term given in 10 CFR Part 20.)

#### Occupational Exposure Criteria

The limits on occupational dose specified in the table in paragraph (a) of 10 CFR 20.101 for the hands and forearms, feet and ankles, and the skin of the whole body apply to all exposures, including hot particle exposures. However, because of the nature of the principal radiation involved (beta), the extremely localized effects, and the lower biological risk, the NRC believes a different limit for hot particle exposures should be established through rulemaking action and that enforcement discretion should be applied until a new limit for hot particle exposures is established by rule. Consequently, the staff will use a new beta emission criterion and a new skin dose criterion for determining appropriate discretionary enforcement actions and appropriate



severity levels for hot particle exposures; however, the staff will continue to evaluate hot particle exposures to terms of absorbed dose for comparison with the limits of 10 CFR 20.101.

For a hot particle exposure of an individual above the limits of 10 CFR 20.101 that results from a hot particle in contact with the skin, the NRC will issue a notice of violation if the beta emission from the particle is greater than the beta emission criterion. For purposes of this policy, the beta emission criterion is established as a beta emission value of  $10^{10}$  beta particles (75 microcurie hours). A notice of violation will not be issued when an individual receives a hot particle exposure that is equal to or less than the beta emission criterion.

For each hot particle exposure, the hot particle will be assumed to have been in contact with the skin throughout the possible irradiation period, even if the particle was found on the hair or clothing of the exposed individual, unless it can be determined that the particle was never in contact with the skin (for example, if the particle was between two layers of clothing).

If it can be determined that the particle was never in contact with the skin, the skin dose criterion, rather than the beta emission criterion, applies. That is, in this case, the NRC will issue a notice of violation if the dose to the skin exceeds the skin dose criterion. For purposes of this policy, the skin dose criterion is established as an occupational dose to the skin of 50 rad at a depth of 7 mg/cm<sup>2</sup> averaged over an area of 1 cm<sup>2</sup> in the region of the highest dose. A notice of violation will not be issued when an individual receives a hot particle exposure that is equal to or less than the skin dose criterion.

The beta emission criterion or the skin dose criterion will be used for each hot particle exposure. There are no quarterly or annual limitations.

In any case, a notice of violation may be issued for violations of other regulatory requirements associated with an event involving hot particle exposures (e.g., violation of 10 CFR 20.201, "Surveys") regardless of the magnitude of the hot particle exposure.

In determining whether a hot particle exposure has exceeded the limits of 10 CFR 20.101, the beta emission criterion, or the skin dose criterion, hot particle exposures will not be added to skin doses from sources other than hot particles, nor will hot particle exposures from different particles be summed unless the different particles result in doses to the same area (location) of skin.

#### Records, Notifications, and Reports

Nothing in this policy should be construed as changing, or in effect changing, other requirements of 10 CFR Parts 19 and 20. In particular, the requirements of 10 CFR 20.401 (records), 10 CFR 20.403 (notifications of incidents), 10 CFR 20.405 (reports of overexposures), 10 CFR 20.408 (reports of personnel monitoring on termination), and 10 CFR 20.409 and 10 CFR 19.13 (notifications and reports to individuals) remain in effect and concern the current dose limits in 10 CFR 20.101. For example, a hot particle exposure resulting in a skin dose of 75 rads to the feet, ankles, hands, or forearms must be reported to the NRC within 24 hours. However, no notice of violation will be issued for a failure to make an immediate notification required by 10 CFR 20.403(a) for a

skin dose that is a result of a hot particle exposure. A notice of violation will be issued for a failure to make a 24-hour notification required by 10 CFR 20.403(b) or to report as required by 10 CFR 20.405 for a dose that is a result of hot particle exposure.

#### Enforcement Examples

In addition to the enforcement discretion concerning issuing notices of violations, enforcement discretion also will be used concerning the severity levels of violations. For a dose to the skin from hot particle exposures, the following examples will be used for determining severity levels:

- a. Severity Level III - Violations involving, for example --
  - (1) Hot particle exposures for which the dose to the skin exceeds the limits of 10 CFR 20.101 and exceeds three times the relevant criterion (either the beta emission criterion or the skin dose criterion).
  - (2) Failure to make a notification required by 10 CFR 20.403(b) or a report (required by 10 CFR 20.405) for a hot particle exposure that results in a skin dose that exceeds the limits of 10 CFR 20.101 and exceeds three times the relevant criterion (either the beta emission criterion or the skin dose criterion).
- b. Severity Level IV - Violations involving, for example --

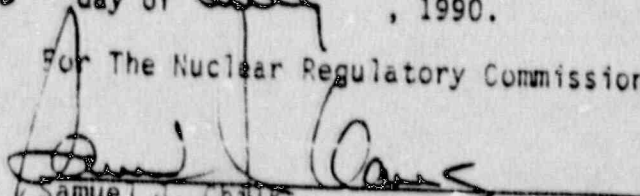


- (1) Hot particle exposures for which the dose to the skin exceeds the limits of 10 CFR 20.101 and exceeds the relevant criterion but does not exceed three times the relevant criterion (either the beta emission criterion or the skin dose criterion).
  - (2) Failure to make a notification required by 10 CFR 20.403(b) or a report (required by 10 CFR 20.405) for a hot particle exposure that results in a skin dose that exceeds the limits of 10 CFR 20.101 and exceeds the relevant criterion but does not exceed three times the relevant criterion (either the beta emission criterion or the skin dose criterion).
- c. Severity Level V - Violations involving, for example --
- (1) Failure to make a notification required by 10 CFR 20.403(b) or a report (required by 10 CFR 20.405) for a hot particle exposure that results in a skin dose that exceeds the limits of 10 CFR 20.101 but that does not exceed the relevant criterion (either the beta emission criterion or the skin dose criterion).

Note: No numerical criteria (beta emission values or skin doses) have been established as examples for Severity Levels I and II.

Dated at Rockville, Maryland, this 25<sup>th</sup> day of July, 1990.

For The Nuclear Regulatory Commission.

  
Samuel J. Chirik,  
Secretary of the Commission.