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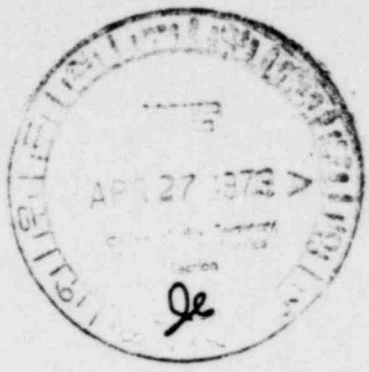

April 17, 1979

(43)

PROPOSED RULE - 19, 20 (44FR10388)

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Docketing and Service Branch

Subject: Proposed Amendments to 10CFR Parts 19 and 20

References: Federal Register, Volume 44, No. 35, February 20, 1979
10388

Exxon Nuclear Company, Inc. appreciates this opportunity to comment on the Commission's proposed rulemaking. We wish to make the following comments:

1. We are generally opposed to the piecemeal approach to modifying the Commission's radiation protection standards which is suggested in this Proposed Rule. In the Supplementary Information supplied, the Commission indicates that a rulemaking hearing on the subject is tentatively scheduled for the Spring of 1979. The Commission presents no justification for a hasty action affecting only a very minor part of the population of exposed workers, and those only by less than a factor of two and one-half in annual dose.

2. The Commission cites the ICRP (ICRP Publication 26) as providing the rationale for eliminating the 5(N-18) dose-averaging formula, establishing instead a 5 rem per year dose-equivalent limit. This change does not wholly reflect the ICRP recommendations. While it is true that the ICRP did not again recommend the 5(N-18) formula, it did recommend certain allowances for planned special exposures during normal operations. (See Paragraphs 113 and 114 of ICRP Publication 26.) In those paragraphs the ICRP recommends, under certain conditions during normal operations, planned special exposures up to 10 rem per event and up to 25 rem in a lifetime. Further, these special event exposures were not to affect the ability of the worker to acquire future annual dose-equivalent limits.

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We do not believe it appropriate for the Commission to cite the ICRP as an authoritative source for making a modification in the permissible dose equivalent limits without considering all of the ICRP recommendations which make up a thoroughly considered, balanced dose-equivalent limit program. We have no objection on the other hand, with modifying the Commissions' Regulations to comply with the updated ICRP recommendation in its entirety. However, there does not appear to be an urgency to do this. Table I presents a limiting case cumulative worker exposure which could be acquired under both 10 CFR 20 and ICRP 26 limits by workers of three different ages entering nuclear service. We observe that:

a) The ICRP 26 limits would permit a higher limiting-case lifetime cumulative exposure to the young high school graduate beginning a career in the nuclear industry, and

b) The ICRP 26 limits would permit significantly higher cumulative exposure during early, and therefore more likely reproductive, years of service.

It is not obvious to us, but perhaps was to the ICRP, that these new recommended limits provide a better balance of cumulative exposures for the total population of workers. In any event there seems no justification for hasty action, but rather for consideration in a more deliberate rulemaking proceeding.

3. In its Supplementary Information the Commission indicates that some 320 workers could be affected by the proposed rulemaking. The commission also advises that the change would have "little effect on the collective (man-rem) dose but the individual risk could be reduced....." and "However, it is very likely that existing licensees would use extra workers in order to accomplish essential work rather than backfitting engineering controls to reduce dose rates and working times. Thus, the collective dose would not be lowered and might be increased." Hence, in its own Supplementary Information, the Commission acknowledges that, using the linear dose effect assumption, the proposed change would probably not reduce the postulated health effects in the overall worker population.

Finally, the Commission does not identify or examine the occupations of the 320 workers. It is likely that some of these are specialists whose population cannot be readily increased. A sudden reduction in permissible annual dose could then have a significant adverse effect on some important aspect of the industry's business.

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For all these reasons we oppose the Commission's proposed actions. We are aware of no information in informed scientific circles, certainly not in the ICRP recommendations, which warrants consideration at this time of reductions in permissible annual dose limits. Therefore, we do not support a general rulemaking proceeding on the subject of an overall reduction in annual dose limits. However, if such a general rulemaking is conducted it would be a more appropriate forum for evaluation of deleting the 5(N-18) formula.

Very truly yours,

R. Nilson, Manager
Licensing

RN:WSN:slr

Attachments:

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1) Table I

2) Paragraphs 113 and 114, ICRP 26.

TABLE I

LIMITING CASE

MAXIMUM CUMULATIVE WORKER EXPOSURE (REM)

	Age Entering Nuclear Service					
	18 Year Old		28 Year Old		38 Year Old	
Age	10CFR20	ICRP26	10CFR20	ICRP26	10CFR20	ICRP26
18	0	25				
19	5	30				
20	10	35				
21	15	40				
22	20	45				
23	25	50				
24	30	55				
25	35	60				
26	40	65				
27	45	70				
28	50	75	12	25		
29	55	80	24	30		
30	60	85	36	35		
31	65	90	48	40		
32	70	95	60	45		
33	75	100	72	50		
34	80	105	80	55		
35	85	110	85	60		
36	90	115	90	65		
37	95	120	95	70		
38	100	125	100	75	12	25
39	105	130	105	80	24	30
40	110	135	110	85	36	35
41	115	140	115	90	48	40
42	120	145	120	95	60	45
43	125	150	125	100	72	50
44	130	155	130	105	84	55
45	135	160	135	110	96	60
46	140	165	140	115	108	65
47	145	170	145	120	120	70
48	150	175	150	125	132	75
49	155	180	155	130	144	80
50	160	185	160	135	156	85
51	165	190	165	140	165	90

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$$\frac{H_I}{H_{wb,L}} + \sum_j \frac{I_j}{I_{j,L}} \leq 1$$

where, H_I is the annual dose-equivalent index, $H_{wb,L}$ is the annual dose-equivalent limit, I_j is the annual intake of radionuclide j, $I_{j,L}$ is the annual limit of intake for radionuclide j.

(111) Although the Commission no longer proposes separate annual dose-equivalent limits for individual tissues and organs irradiated singly, the implied values of such limits may be obtained, if required, by dividing the dose-equivalent limit $H_{wb,L}$ (50 mSv in a year) by the relevant value of w_T. Such values would be subject to the limits, based on non-stochastic effects, given in paragraph 103.

(112) It should be recognized that the limits have been derived for application in average situations, for all adult ages and for both sexes and without regard to individual circumstances which might enhance the risk. The Commission believes that, for example, any variation in risk with age will not influence the total risk from a lifetime exposure unless the exposure is limited to a special group. Additional precautions and dose limitations may be necessary, however, to limit the irradiation of an embryo or foetus in the case of occupational exposure of pregnant women (see paragraphs 115 and 116).

Planned special exposures. (113) Situations may occur infrequently during normal operations when it may be necessary to permit a few workers to receive dose equivalents in excess of the recommended limits. In such circumstances external exposures or intakes of radioactive material may be permitted provided the dose-equivalent commitment does not exceed twice the relevant annual limit in any single event, and, in a lifetime, five times this limit. The Commission wishes to

emphasize that external exposures or intakes of this magnitude are only justified when alternative techniques, which do not involve such exposure of workers, are either unavailable or impracticable (see also paragraph 171).

(114) Planned special exposures should not be permitted if the worker has previously received abnormal exposures resulting in dose equivalents in excess of five times the relevant annual limit. Planned special exposures should not be permitted for women of reproductive capacity. Dose equivalents resulting from planned special exposures should be recorded with those from usual exposures, but any excess over the limits recommended in paragraphs 103 *et seq.* should not by itself constitute a reason for excluding a worker from his usual occupation. (Accidental and emergency exposures are discussed in section G).

Occupational exposure of women of reproductive capacity. (115) When women of reproductive capacity are occupationally exposed under the limits recommended in paragraph 108, and when this exposure is received at an approximately regular rate, it is unlikely that any embryo could receive more than 5 mSv during the first 2 months of pregnancy. Having regard to the circumstances in which such exposures could occur, the Commission believes that this procedure will provide appropriate protection during the essential period of organogenesis.

Occupational exposure of pregnant women. (116) It is likely that any pregnancy of more than 2 months' duration would have been recognized by the woman herself or by a physician. For reasons described in paragraph 65, the Commission recommends that, when

Dose-equivalent limits for individual members of the public. (117) Radiation risks are a very minor fraction of the total number of environmental hazards to which members of the public are exposed. It seems reasonable therefore to consider the magnitude of radiation risks to the general public in the light of the public acceptance of other risks of everyday life. This acceptance (when related to risks that could not be reduced or avoided entirely) is motivated by the benefits that would not otherwise be received, by an assessment of the social cost of achieving a possible reduction of risk, or by an implicit judgment that the risk is negligible.

(118) The acceptable level of risk for stochastic phenomena for members of the general public may be inferred from consideration of risks that an individual can modify to only a small degree and which, like radiation safety, may be regulated by national ordinance. An example of such risks is that of using public transport. From a review of available information related to risks regularly accepted in everyday life, it can be concluded that the level of acceptability for fatal risks to the general public is an order of magnitude lower than for occupational risks. On this basis, a risk in the range of 10^{-6} to 10^{-5} per year would be likely to be acceptable to any individual member of the public.

(119) The assumption of a total risk of the order of 10^{-2} Sv^{-1} (see paragraph 60) would imply the restriction of the lifetime dose to the individual member of the public to a value that would correspond to 1 mSv per year of life-long whole body exposure. For the reasons given in the following paragraphs, the Commission's recommended whole body dose-equivalent limit of 5 mSv (0.5 rem) in a year, as applied to critical groups, has been found to provide this degree of safety and the Commission recommends its continued use under the conditions specified in paragraphs