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May 4, 1979

Mr. Robert E. Alexander  
Office of Standards Development  
United States Nuclear  
Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Alexander:

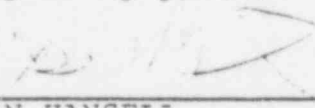
Enclosed herewith are the Comments of the People of the State of Illinois on The Nuclear Regulatory Commission Proposal to Amend 10 CFR Parts 19 and 20 "Notices, Instructions, and Reports to Workers: Inspection Standards For Protection Against Radiation" 44 Fed. Reg. 35 (February 20, 1979).

These comments are being submitted after the expiration date for comments provided in the Federal Register of February 20, 1979 pursuant to our conversation of April 27, 1979.

During that conversation you consented to our submitting our comments one week late.

If you have any questions regarding our comments do not hesitate to contact me.

Very truly yours,

  
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Enclosure

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COMMENTS OF THE PEOPLE OF THE STATE OF ILLINOIS ON  
THE NUCLEAR REGULATORY COMMISSION PROPOSAL TO AMEND  
10 CFR PARTS 19 AND 20 "NOTICES, INSTRUCTIONS, AND  
REPORTS TO WORKERS: INSPECTION STANDARDS FOR PRO-  
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20, 1979)

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The People of the State of Illinois (hereinafter "Illinois") by William J. Scott, Attorney General of the State of Illinois, submits the following comments to the Nuclear Regulatory Commission on proposed changes to 10 CFR Parts 19 and 20, "Inspection Standards for Protection Against Radiation."

Illinois submits these comments because of our state's strong dependence on nuclear power and the large number of employees working in commercial Illinois nuclear facilities. At the present time there are seven commercial nuclear reactors in Illinois at three different sites with a combined total of 1270 employees. Illinois also has a uranium hexafluoride conversion facility, a spent fuel storage facility, a low level nuclear dump (closed), and several experimental reactors. Illinois is also the home of three large government nuclear research laboratories.

The NRC proposes to amend 10 CFR Parts 19 and 20 inter alia to do the following:

1. Provide a maximum annual dose limit of 5 rems per year for workers;
2. Eliminate the 5 (N-18) dose averaging formula;
3. Raise the permissible dose limit per calendar quarter to three rems; and
4. Invites comment whether the dose limit per quarter standard should be eliminated.

For the reasons pointed out below, Illinois favors:

1. A reduction of the dose limit standard for workers to 0.5 rems per year to be done incrementally over a three year period; and
2. Monitoring on a consecutive basis rather than on a calendar basis.

In the alternative, if the Nuclear Regulatory Commission does not lower the dose-limiting standards for workers Illinois opposes increasing the quarter calendar standard to three rems per quarter.

The basic radiation dose limit should be reduced to 0.5 rems per year. There is mounting evidence that the exposure standard of 5 rems per year is inadequate to protect workers. A ten year study of nuclear dock workers in England noted a four fold increase in the number of abnormal chromosomes.<sup>1</sup> Although only a small population was studied, it does provide evidence that definite gene mutations occur at lower levels of radiation and thus possible heritable abnormalities in later generations may occur.<sup>2</sup> Over 5% of all U.S. nuclear workers, over 4500 people, received greater than two rems of exposure in 1977 and thus run an increased risk of chromosomal mutations.

The controversial Mancuso, Stewart and Kneale Study of atomic workers at the Hanford (Washington) reservation and the

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1. H.J. Evans, K.E. Buckton, G.E. Hamilton, A. Carothers "Radiation - Induced Chromosome Aberrations and Nuclear - Dock Yard Workers", Nature 277: 531, February 15, 1979.

2. The researchers followed 197 dock yard workers over the 10 year period.

3. Thomas F. Mancuso, Alice Stewart and George Kneale, "Radiation Exposure of Hanford Workers Dying From Cancer and Other Causes." Health Physics Vol: 33, P. 365-389.

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Portsmouth Naval Shipyard study both conclude that workers exposed to lower levels of radiation are subject to an increased incidence of cancer. Both studies have been the subject of criticism.<sup>5</sup> However, like the British Shipyard study they raise a credible inference that the dose limitation standard of 5 rems is too high and suggest that the linear dose threshold model is not a conservative model of cancer risks at low levels. The Mancuso study shows an increased incidence of cancer of the bone marrow, pancreas and lungs at exposure levels 10 to 20 times below the present federal standards. The Portsmouth Shipyard study found the observed cancer to expected cancer ratio to be 5.62 despite a conclusion by the study's authors that the shipyard workers received only a lifetime total of ten rems per exposure.

Illinois thus recommends lowering the maximum exposure dose limitation to .5 rems. .5 rems is the standard suggested inter alia by Dr. Edward Radford, Chairman of the Biological Effects of Ionizing Radiation Committee (BEIR Committee) of the National Academy of Sciences,

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4. Thomas Najarian and Theodore Colton, "Mortality from Leukemia and Cancer in Shipyard Nuclear Workers," The Lancet, May 13, 1978, pp. 1018-1020.

5. The Mancuso Study in particular has been criticized for its limited sample and for its statistical analysis. A reanalysis was performed using a larger sample of Hanford data which appears to have had satisfying some of the harsher critics. Thomas F. Mancuso, Alice Stewart, George Kneale, "Reanalysis of Data Relating to Hanford Study of the Cancer Risks of Radiation Workers," (1944-77). 24 October, 1978. The reanalysis is suggestive of a rising risk with a rising dose.

as that standard necessary to insure safety to workers at nuclear facilities.<sup>6, 7</sup>

The reduction of the exposure limitation will result in additional expense to the nuclear industry, the purpose of these regulations is worker safety. Greater protection will reduce the health hazards to workers in the nuclear industry.

To minimize the burden on utilities Illinois believes the new standards should be phased in. Such a standard should be immediately effective for new nuclear facilities but for existing nuclear facilities such a standard should be implemented over a three year period<sup>8</sup> with a reduction to 2.5 rems required at the end of the first year, reduction to one rem by the second year and reduction to 0.5 rems by the third year.

If the dose limitation standard is lowered to .5 rems then Illinois believes that will provide a sufficient safety margin to justify<sup>9</sup> elimination of the 5 (N-18) formula and the calendar quarter limitation.

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6. Joseph Roblatt, Emeritus Professor of Physics at the University of London and past President of the British Institute of Radiology on the basis of his recent analysis calls for lowering the dose limit by a factor of five. J. Rotblatt, "The Risks for Radiation Workers" The Bulletin of Atomic Scientists, September, 1978.

7. Dr. Carl Z. Morgan, Professor of Health and Physics at the University of Georgia favors lowering the maximum permissible exposure by a factor of two. However, he also calls for lowering the total man-rem-dose. Carl Morgan, "Cancer and Low Level Ionizing Radiation" Bulletin of Atomic Scientists, September, 1978.

8. A distinction in standards between new facilities and existing facilities has been employed elsewhere. See, for example, the Clean Air Act, 42 U.S.C. 7401 et seq.

9. Note: If the standard is not lowered to .5 rems Illinois does not favor limiting the calendar quarter limitation nor does it favor eliminating consideration of radiation dose past history.

Illinois supports replacing the calendar year standard with measurement on a 365 consecutive day basis. A 365 consecutive day basis eliminates the arbitrariness of the calendar model and protects against the possibility of a worker receiving a high but permissive dose late in a calendar year which is eliminated from consideration in the following year.

One argument against lowering the dose standard is that industry will simply hire more workers and spread the dose limit among a larger population thus further exposing the gene pool. While hiring more workers is one way to meet higher dose levels utilities also have the option of reducing worker exposure through the development of greater safety devices and procedures. The Nuclear Regulatory Commission can provide an incentive to utilities to provide such additional control through imposing a maximum man-rem level per plant.

The As Low As Reasonably Achievable concept (ALARA) is not a sufficient substitute for lowering the dose standard. It is a vague standard which causes much uncertainty for industry and is virtually unenforceable because of the difficulties of proving that a proposed improvement is both "achievable" and "reasonable".

If the Nuclear Regulatory Commission does not opt to lower the existing standard Illinois supports retention of the quarter standard, favors conversion of it to a calendar quarter rather than a calendar quarter (for the same reasons discussed above) and opposes increasing the permissible quarter level to three rems.<sup>10</sup>

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10. Increasing the permissible quarter level for new facilities especially will not increase flexibility and will not encourage utilities to reduce worker exposure as much as possible.

Respectfully submitted,

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Attorney General  
State of Illinois

BY:   
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