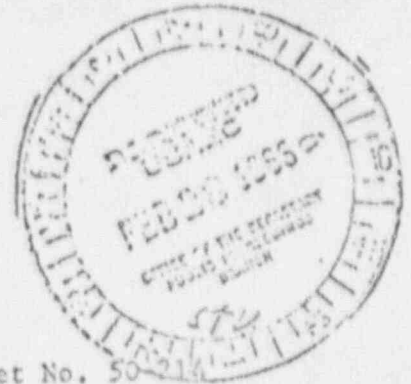


UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION



In the Matter of)
)
DEPARTMENT OF WATER AND POWER)
OF THE CITY OF LOS ANGELES)

Docket No. 50-214

ADC REGULATORY STAFF'S RESPONSE TO BOARD'S QUESTION
CONCERNING MEANING OF "UNDUE RISK"

During the hearing the Board asked for comments from each of the parties concerning the meaning of the phrase "without undue risk to the health and safety of the public" as used in issue number 1.4 prescribed by the Commission for consideration in this proceeding. Issue number 1.4 reads as follows:

"Whether ... there is reasonable assurance that ... (2) (ii) taking into consideration the site criteria contained in Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public." The Board has particularly requested a statement of each parties' understanding of the word "undue", whether "undue" means "unnecessary" and, if so, "unnecessary in view of what requirements."

*Dist to full
Committee at
81st meeting*

The phrase in question is used in Part 50 of the Commission's regulations, particularly Section 50.35, which lists the issues upon which the Commission must make a finding in order to issue a provisional construction permit. A proper definition of undue risk in the context in which it is used requires an understanding of the phrase "reasonable assurance". The Commission in its final decision in the PRDC case adopted the definition of "reasonable assurance" set forth in Great Atlantic & Pacific Tea Co. v. Hughes, 53 Ohio App. 255, 4 N.E. 2d 700 (1935). In that case, the court said "reasonable assurance means reasonable probability, established under the particular circumstances of the case in good faith and in the exercise of sound discretion and expert judgment."

The term "undue risk" itself as used in the regulations has not been defined specifically in any decision of the Commission or the courts. But there are guideposts to a definition to the term in various Commission decisions and actions. First, it is clear that the phrase does not mean the absence of all risk -- absolute safety. This is implicit in the words themselves -- "without undue risk" rather than simply "without risk." Safety in everyday life does not mean an absolute freedom from injury or risk.

Nor, in our view, does the phrase mean "unnecessary" or "avoidable" risk. The logical extension of such a definition leads eventually to a definition synonymous with "absence of risk" since all risk can be avoided simply by refraining from building reactors or using any kind of radioactive material in any way. This is clearly contrary to the intent of the Congress in passing the Atomic Energy Act of 1954 to provide for the peaceful, private use of atomic energy. In that Act Congress declared it to be the policy of the United States that:

"a. the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare, subject to all times to the paramount objective of making the maximum contribution to the common defense and security; and

"b. the development, use, and control of atomic energy shall be directed so as to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise."

The benefits of the peaceful uses of nuclear energy, and in particular the benefits of the generation of electric power by the use of nuclear energy, have been recognized by the Congress of the United States in the enactment of the Atomic Energy Act

of 1954. This law authorized the use of nuclear energy by private individuals under such safety criteria and standards as the AEC deems necessary to protect the health and safety of the public. Pursuant to the Atomic Energy Act, the AEC has issued regulations under which nuclear power plants may be operated. These regulations include Part 50 - Licensing of Production and Utilization Facilities, Part 20 - Standards for Protection Against Radiation, and Part 100 - Reactor Site Criteria.

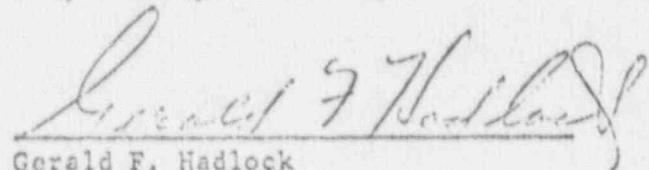
In Part 20 of its regulations, the Commission has established standards for protection against radiation hazards during normal operations of the reactor facilities licensed by the Commission under Part 50. In Part 100, the Commission has, in effect, established general guides ("reference values") to be used in the evaluation of reactor sites with respect to potential reactor accidents of exceedingly low probability of occurrence and low risk of public exposure to radiation. In so doing, it has, in effect, defined undue risk to public health and safety in the event of a severe accident to a reactor facility proposed to be licensed under Part 50.

In Section 100.11, a method of determining the exclusion area, low population zone, and population center distance from a nuclear power plant, is described based upon an assumed

fission product release resulting from a major accident which would cause potential hazards not exceeded by those from any accident considered credible. Under this regulation a so-called "maximum credible accident" for a particular facility can be identified. The guides of Part 100 have been incorporated into Part 50 in Section 50.35(a) in that part of the regulations which state "taking into consideration the site criteria contained in Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public." This, of course, is also the language of issue number 1.4 in this proceeding.

In the judgment of the AEC regulatory staff, the evidence in this proceeding clearly supports an affirmative conclusion with respect to this issue.

Respectfully submitted,



Gerald F. Hadlock
Counsel
AEC Regulatory Staff

Dated at Bethesda, Maryland
this 26 day of February, 1966.

NCPC

NATIONAL COAL POLICY CONFERENCE, INC.

1000 SIXTEENTH STREET, N. W. WASHINGTON, D. C. 20036

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November 30, 1966

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ATOMIC ENERGY COMM.
JOINT COMMITTEE ON
REACTOR SAFEGUARDS

Honorable Chet Holifield
Chairman, Joint Committee on Atomic Energy
Room H-403, The Capitol
Washington, D. C.

Dear Mr. Chairman:--

This letter is to bring to your attention three matters which disturb me and members of this organization. These are:

1. The fuel melt down accident to the Fermi Reactor with the apparent hazard it would have created had it been operating at full power;
2. The questions raised by the Advisory Committee on Reactor Safeguards regarding the apparent absence of necessary methods for calculating the design and engineered safeguard criteria; and
3. The very serious questions pointed up regarding the adequacy of methods for disposing of toxic by-products of nuclear power plants in the report of the Subcommittee on Science, Research and Development of the House Committee on Science and Astronautics.

Any one of these is sufficient to highlight the need for a full public airing of all the knowns and unknowns of the state of the nuclear industry, particularly if it affects the public welfare.

Mr. Chairman, this letter is not written and will not be used in an attempt to sensationalize the dangers suggested by these facts. Rather, we sincerely feel that the American people are entitled to know the answers to these questions and to be aware of the possible shortcomings of nuclear powered electric systems, as well as of the well touted benefits which are being ascribed to it.

Although there has been a modest amount of publicity in atomic energy newsletters, which have limited circulation outside the profession and the industry, the Atomic Energy Commission has not, to the best of my knowledge, issued a public statement or press release commenting on the Fermi accident

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particularly as it relates to the very important matter of reactor safety. In fact, unless one digs through the voluminous Fermi reactor docket in the AEC Public Document Room, one is not even aware that this mishap involved malfunctions which the AEC has agreed would occur in a "maximum credible accident." The Hazards Summary Report, prepared by the Fermi plant owners and operators and, moreover, approved by the Safety Evaluation Staff, AEC Division of Reactor Licensing, states:

"The maximum credible accident in the Fermi reactor is the melting of some or all of the fuel in one core assembly. . ." (emphasis added)

The "maximum credible accident" is defined by the AEC AD:

"The most serious reactor accident that can be hypothesized from an adverse combination of equipment malfunction, operating errors, and other foreseen causes."

Time and again the AEC has blandly reassured the public that "maximum credible accidents" border on the impossible. The Fermi incident appears to us as a timely, if unexpected, example of unwarranted reliance on safety and hazards analyses and on licensing procedures and the possible impact, whether on the utility or the public or both, of design and/or operational errors. It is even of more serious concern, since this plant went through a most extraordinarily extensive series of evaluations, pre-operational tests, as well as tests at extremely low power levels. Moreover, it has been operated "conservatively", at less than 20% of AEC licensed level, not because of any hazard considerations, but because of company self-imposed limitations on the core life for economic considerations. Fortunately, because it was being operated so cautiously and at such a low power level, we are told that there were no on-site or off-site radiation hazards. But, it has demonstrated that a "maximum credible accident" can happen. The question naturally arises: What would have occurred if the Fermi plant operators, unhampered by lack of funds, had been willing to upgrade plant operation -- still within AEC licensed limits?

Insofar as we can learn, the AEC has not answered this question, although we have waited some six weeks in expectation that it would do so.

Last March, Mr. Shaw, AEC Director, Division of Reactor Development and Technology, testified before your Committee as follows:

"Any fast flux test facilities such as Fermi would be invaluable in terms of the near future, particularly until the FFTF becomes operational." (emphasis added)

In light of this statement, how will this "invaluable" loss affect the AEC's fast breeder reactor program? Does the AEC expect to contribute to or finance the rehabilitation of the Fermi plant, if this is feasible?

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We urge the Joint Committee to obtain from the Commission an evaluation of this incident as it relates to reactor safety analyses and evaluations, to licensing procedures and to the fast breeder reactor development program. The public is entitled to full and candid information. The fact that a "serious credible accident" did occur alone warrants official disclosure.

Second, and not unrelated to my previous comments, I refer to the letter from the Advisory Committee on Reactor Safeguards addressed to the Chairman of the Atomic Energy Commission, dated October 12, 1966, on the "Report on Reactor Safety Research Program". This was only released by the AEC two weeks later without comment. Although the Commission's safety evaluation staff, the Safety and Licensing Board and the Commission, itself, proceed almost routinely to issue construction permits to larger and larger nuclear power plants at locations close to population centers, the letter from the ACRS raised some very important pertinent questions with regard to calculations used in determining the criteria for the design of engineered safeguards of these reactors and the fact that many of the methods necessary for calculating how to handle possible failures do not at this time exist. I refer you in particular to Paragraph B.4 on page 3.

"In connection with the review of power reactors for construction permits and operating licenses by regulatory bodies, standard methods of calculating various important events, ranging from reactivity excursions to reactor blow-down following a postulated coolant system rupture, usually do not exist. Applicants use a variety of methods employing a range of parameters. It would be helpful if a series of calculational methods could be developed and placed into use, against which the methods and parameters used by individual applicants could be compared. (Emphasis added)

"Alternatively, a series of reference problems (and solutions) might be established which the applicant could calculate by his particular methods, and the results studied to help judge their degree of conservatism."

If the ACRS cannot even judge the degree of conservatism of the applicant's calculations, it appears to us to be a most serious situation when the Commission issues construction permits with the standard phraseology that the "facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public".

The ACRS clearly is still concerned, and even more so with regard to the trend toward larger and larger nuclear plants, with the unproven invulnerability of the reactor pressure vessel and the primary coolant system against catastrophic failure, as well as the continuing need for developing "practical, effective methods for extensive periodic inspection of pressure vessels".

I have commented only on a few of the Advisory Committee's recommendations, but taken together they indicate a serious deficiency in the present



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state of knowledge and understanding of design criteria for engineered safeguards of nuclear power plants when contrasted with the unalimited rapid growth of the commercial use of nuclear power and the trend toward larger plants closer and closer to large centers of population. Under the circumstances, I find it difficult to understand how the Commission, a public agency, can, in good conscience, continue its promotional activities and apologetic assurances to the public. The Chairman of the ACRS concludes his letter with the paragraph:

"It should be noted that information developed in connection with several items listed above would not only help to enhance public safety . . ." (Emphasis added)

Perhaps the AEC can explain how public safety can be enhanced when they proclaim to the public that nuclear power plants are completely safe! It appears to me that this is a subject which could receive the Joint Committee's careful consideration at some future hearings.

Third, the Subcommittee on Science, Research and Development of the House Committee on Science and Astronautics recently raised questions as to the adequacy of methods for disposal of "toxic by-products" of nuclear power plants. The Subcommittee questions the usefulness for the long term future of the present system of burying the waste in containers underground and remarks that "someday that system will no longer be feasible".

The radioactive materials produced by nuclear power plants, whether from discharged fuel elements or from the dismantling of failed or obsolete plants, truly add something new and potentially dangerous to our environment. These are hazardous elements which do not occur in nature. Are we prepared to handle and safely control these materials for hundreds of years, thousands of years, or even infinitely? One reads of estimates of the hundreds of billions of curies of radioactivity which will appear in the wastes of nuclear fuel processing plants less than forty years from now. This does not include the plutonium produced, the most hazardous new element known to man.

One also reads casually, mostly in the context of fuel cycle economics, that processing and fabrication losses of nuclear fuel may amount to as much as 0.1 to 1% per cycle. Only recently it was reported that over a period of some six years and several contracts a company "lost" 6% of the highly enriched uranium that had been supplied to it by the AEC. It is apparently not uncommon that significant disagreements arise between AEC and fabricators and processors in accounting for fissionable materials.

By the year 1980, Chairman Seaborg estimates cumulative plutonium produced world wide will be almost 400,000 lbs. Even a very conservative cumulative "loss", or only 1%, of this is 4,000 lbs., equivalent to 4,000 billion maximum permissible body burdens -- unaccounted for! It can hardly be expected that the public will be reassured if losses or discrepancies of this magnitude are ascribed to imperfect measuring procedures.

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Mr. Hollifield

November 30, 1956

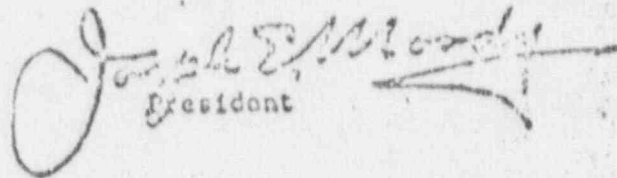
In view of the Subcommittee's comments and the increasing amount of waste which will have to be disposed of as the number and size of nuclear plants rapidly increase, it appears to us that the time has arrived for an up-to-date, detailed and comprehensive evaluation of the state of the art of waste disposal and just how adequate presently developed systems or those under investigation will be in the context of the increased radioactive materials which must be safely disposed of and/or protected from our environment for centuries or even in perpetuity. Closely associated with the problem of radioactive wastes is the problem of fissionable material accountability. These problems could well be considered at the same time.

We feel that the great segment of the American economy which is dependent on coal and is more and more being forced to compete with a commercial nuclear power complex developed and nourished by the government is entitled to wage that competition under a full disclosure of the dangers and disadvantages with which atomic plants and the public may be plagued, as well as the fully propagandized advantages.

I am certain that the members of the Joint Committee share our concern and will make it their responsibility to see that these matters are given full public disclosure and consideration.

For the reasons previously cited, we do not intend to make this letter public, at least until the Joint Committee and the AEC, whose members we assume you will consult, have had an opportunity to consider it and make any comments they feel appropriate.

Respectfully submitted,


President

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December 5, 1966

Mr. Joseph Moody
President
National Coal Policy Conference, Inc.
1000 Sixteenth Street, N. W.
Washington, D. C. 20036

Dear Mr. Moody:

In the absence of Chairman Hollifield I am taking the liberty of acknowledging receipt of your letter of November 30 which arrived at the Joint Committee office Friday, December 2.

I am forwarding a copy of your letter to Mr. Hollifield, who presently is in his Home District in California. I am also making a copy of it available to the Atomic Energy Commission for its comments, which you indicated might have an opportunity to consider it and make comments.

Sincerely yours,

John T. Conway
Executive Director

cc: Honorable Chet Hollifield

✓cc: Dr. Seaborg, Chairman AEC

U. S. ATOMIC ENERGY COMM.
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