Vol 5

MH&S-3-Radiation

Vol. 4 Correspondence beginning with 7-19-62 to 3-11-63
Vol. 5 Correspondence beginning with 3-12-63 to

MH&S-3-Radiation

	Date	To	From	Class	Pgs.	No.	To	From	Class
1	7-20-62	Radiological Health Data Iodine 131 Exposure	vee						
2	8-10-62	AEC 604/67 Federal Radiation Council	vee						
3	8-27-62	Bennett, Senator Wallace F.	skw						
4	9-17-62	AEC 604/68	vee						
5	9-18-62	AEC 604/69	vee						
6	11-1-62	AEC 604/70 Environmental Radioiodine Problem Radioiodine Problem	vee						
7	1-14-63	AEC 604/71	skw						
8	1-24-63	AEC 604/72 Labor Department Walsh-Healey Public Contracts Act	skw						
9	2-8-63	AEC 604/73 Policy re Iodine in Fallout Iodine in Fallout	vee						
10	2-6-63	Atomic Bomb Casualty Comm	vee						
11	3-11-63	AEC 604/74	skw						
~~12~~	~~3-14-63~~	~~AEC 604/75~~ Vol 2	~~skw~~						

MH.S-3

UNCLASSIFIED

March 11, 1963

AEC 604/74

COPY NO. 63

ATOMIC ENERGY COMMISSION

WHITE HOUSE PRESS RELEASE ON RADIATION PROTECTION ACTIVITIES OF FEDERAL AGENCIES

Note by the Secretary

The Director of Regulation has requested that the attached White House Press Release be circulated for the information of the Commission.

W. B. McCool

Secretary

DISTRIBUTION	COPY NO.
Secretary	1
Commissioners	2 - 6,69
Dir. of Regulation	7 - 8
General Manager	9 - 10
Deputy Dir. of Regulation	11
Deputy Gen. Mgr.	12
Asst. Gen.Mgr.	13
Asst. GM-Plans & Prod.	14
Asst. GM Operations	15
Asst. Gen. Mgr. R&D	16
Asst. Gen. Mgr. Adm.	17
General Counsel	18-22
Biology & Medicine	23
Compliance	24-30
Congr. Liaison	31
Public Information	32-33
Inspection	34
Licensing & Regulation	35-36
Military Application	37
Operational Safety	38
Operations Analysis	39
Peaceful Nuclear Expl.	40
Production	41-44
Radiation Standards	45-49
Reactor Development	50-58
Manager, Naval Reactors	59
D. C. Office	60-62
Secretariat	63-68

AEC 604/74

3-11-63

IMMEDIATE RELEASE FEBRUARY 26, 1963

Office of the White House Press Secretary

THE WHITE HOUSE

THE WHITE HOUSE TODAY MADE PUBLIC THE FOLLOWING MEMORANDUM TO THE PRESIDENT FROM ANTHONY J. CELEBREZZE, SECRETARY OF HEALTH, EDUCATION AND WELFARE, AND CHAIRMAN OF THE FEDERAL RADIATION COUNCIL

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Radiation Protection Activities of Federal Agencies under Radiation Protection Guidance for Federal Agencies promulgated by the President

In line with its statutory responsibility to advise the President on radiation matters directly and indirectly affecting health, including guidance to Federal agencies on radiation standards, the Federal Radiation Council in 1960 established the following system of reporting by Federal agencies on their radiation protection activities:

1. A regular annual report by each agency on August 1 as to any operating criteria or regulations revised, adopted, or promulgated during the previous year under the Radiation Protection Guidance for Federal Agencies promulgated by the President.

2. Prompt notification of the Council of the adoption or promulgation of any new or revised operating criteria or regulations in areas covered by approved Radiation Protection Guides. Cases involving levels in excess of such guides are to be noted.

The following Federal agencies having radiation protection responsibilities which might fall under the Radiation Protection Guidance for Federal Agencies promulgated by the President submitted an annual report for the period ending August 1, 1962.

Atomic Energy Commission
Department of Agriculture
Department of Commerce
Department of Defense
Federal Aviation Agency
Department of Health, Education, and Welfare
Department of the Interior
Interstate Commerce Commission
Department of Justice
Department of Labor
National Aeronautics and Space Administration
Post Office Department
Department of the Treasury
Veterans Administration

Replies indicate that the Federal agencies are conducting their radiation protection activities in accordance with the Presidential guidance, and that as of the date of their reports no deviations from the guides were in effect. In connection with the weapons tests held this year at the Nevada Test Site, the Atomic Energy Commission has continued to use offsite population exposure criteria adopted by the Commission in 1955.

Recommendation 7 of Radiation Protection Guidance for Federal Agencies promulgated by the President on May 13, 1960 states:

> "The guides may be exceeded only after the Federal agency having jurisdiction over the matter has carefully considered the reason for doing so in light of the recommendations in this paper."

Consistent with the recommendation, the Federal Radiation Council will continue to follow the practices of the Federal agencies as set forth in these reports and will bring to your attention such matters as seem appropriate.

s/ Anthony J. Celebrezze

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DC:216 CLD

M H.R. 3 Production

FEB 25 1963

Dear Mr. Gordon:

The Joint Committee on Atomic Energy has requested the Atomic Energy Commission's comments on H.R. 12945. We understand that comments are desired although the bill was introduced in the last Congress and has not yet been reintroduced.

We would appreciate your advice as to whether there is any objection to the submission of our proposed reply, a copy of which is attached.

Sincerely yours,

[Signed] Glenn T. Seaborg

Chairman

Honorable Kermit Gordon
Director
Bureau of the Budget

Enclosure:
Draft Comments on H.R. 12945

cc: Chairman (2)
General Manager
H. L. Price
T. O. Fleming

2 25 63

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

DRAFT

Dear Senator Pastore:

The Joint Committee has requested the AEC's comments on H. R. 12945, a bill introduced by Mr. Kastenmeier in the Second Session of the 87th Congress. Among the stated purposes of the Bill is to "control the human intake of agricultural commodities containing radioactive substances."

The Commission recommends deletion of Section 3 of the Bill. That section would require the President to establish standards regarding the levels of radioactivity at which it is necessary to take action to reduce the exposure of the population and control the human intake of agricultural commodities containing radioactive substances.

Briefly, the reasons for our suggestion are these. There are no levels of radiation exposure for the public likely to be encountered as a result of fallout of which it can be said either that there is no hazard or that the hazard is so large that higher exposures could not be accepted with good reason. Thus, it is impossible to establish levels at which exposure will be reduced or human intake controlled without consideration of the reasons for existence of the levels. If there were no reasons for acceptance, the limits would be set at zero.

Standards of radiation protection in current use have evolved over a period of thirty years. They reflect our concern for minimizing radiation hazards as well as recognition of the effort required to limit the release to the environment of radioactive materials from industrial and scientific installations. Standards appropriate for the control of fallout in agricultural products, to be meaningful, must take into account a different set of factors, which include not only possible dietary and economic effects, but also possible impact upon our national security. At best it is difficult to reach a consensus on such questions. We believe that at the present time it would be impossible to establish a meaningful set of standards automatically applicable to any situation which might arise in the future. Without knowledge of the circumstances extant when a decision is required, a pre-determined action level may well be too high or too low. In the one case, it would fail its intended purpose; in the other, it might be detrimental to the national security through an adverse effect on our international

DRAFT

position or through reduction of our freedom to make vital decisions. These detrimental effects could far outweigh the small reductions in health hazards which might be achieved.

We would also suggest that lines 21 through 25 on page 3 of the Bill [Section 6 (a)] be revised to read:

> "Sec. 6 (a) Upon direction by the President when he determines that it is necessary in any area to control the human consumption of agricultural commodities containing radioactive substances, the Secretary of Health, Education and Welfare shall carry out a program in such areas under which . . .".

As revised, the legislation would provide for monitoring and reporting of levels of radioactivity and advance planning of countermeasures to be taken if future need arose. The President would determine whether in any particular instance countermeasures should be instituted and would direct the Secretary of Health, Education and Welfare to carry them out. We believe that this would assure that the decision to institute countermeasures will be made at the appropriate governmental level if the need for such action arises.

Finally, since the President has already appointed the Secretary of Agriculture to the Federal Radiation Council pursuant to Section 274 (h) of the Atomic Energy Act, we believe that lines 3 through 6 on page one of the Bill may be deleted.

The Bureau of the Budget has advised that there is no objection to the presentation of this report from the standpoint of the Administration's program.

Sincerely yours,

Chairman

Honorable John O. Pastore
Chairman
Joint Committee on Atomic Energy
Congress of the United States

DRAFT

MH&S 3. Radiation

OPTIONAL FORM NO. 10
5010-104

~~OFFICIAL USE ONLY~~

Reference Section

UNITED STATES GOVERNMENT

Memorandum

TO : Forrest Western, Director
Office of Radiation Standards

DATE: February 21, 1963

FROM : W. B. McCool, Secretary

Original signed W. B. McCool

SUBJECT: AEC 604/73 - RESPONSE TO DRAFT STATEMENT OF THE FEDERAL RADIATION COUNCIL "COUNCIL POLICY REGARDING IODINE IN FALLOUT"

SECY:JCH

1. At Meeting 1912 on February 14, 1963, following discussion of AEC 604/73 - Response to Draft Statement of the Federal Radiation Council "Council Policy Regarding Iodine in Fallout", the Commission requested the proposed letter to the Federal Radiation Council be revised to clearly reflect AEC's understanding of the proposal made by Mr. Wiesner at the recent Council meeting as well as AEC's position on the need for a mechanism for providing appropriate coordination and advice on the hazards of fallout.

2. The General Manager has directed you to take the action required by the above request. It is our understanding that your office is preparing the revised letter to the FRC in accordance with paragraph 1 above. Copies of this letter together with all other pertinent correspondence should be provided the Office of the Secretary.

cc:
Chairman
Commissioner Haworth
Director of Regulation
Deputy Director of Regulation
General Manager
Deputy General Manager
Asst. General Manager
Asst. General Manager for Operations
General Counsel
Director, Operational Safety

Copies filed in MH&S Radiation Institute as M-7-FRC

2-21-63

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SMHS-3

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Reference Section

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: February 11, 1963

FROM : W. B. McCool, Secretary

SUBJECT: AEC 604/72 - U. S. DEPARTMENT OF LABOR PROPOSED RADIATION SAFETY AND HEALTH STANDARDS

SECY:MK

1. At Meeting 1911 on February 6, 1963 during discussion of AEC 604/72 - U. S. Department of Labor Proposed Radiation Safety and Health Standards, the Chairman requested that AEC 604/72 be brought back to the Commission for further consideration after consultation with Mr. Biemiller of the Labor Management Advisory Committee.

2. It is our understanding that the matter will be discussed with Mr. Biemiller at a meeting scheduled for 9:30 a.m. on February 12, 1963 in Commissioner Ramey's office with appropriate staff present.

cc:
Chairman
Commissioner Ramey
Director of Regulation
Deputy Director of Regulation
General Manager
Deputy General Manager
Asst. General Manager
Asst. Gen. Mgr. for Operations
General Counsel
Director, Labor Relations
Director, Operational Safety
Director, Licensing & Regulation
Director, Radiation Protection Standards

2-11-63

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AEC 604/73

February 8, 1963

COPY NO. 47

ATOMIC ENERGY COMMISSION

RESPONSE TO DRAFT STATEMENT OF THE FEDERAL RADIATION COUNCIL "COUNCIL POLICY REGARDING IODINE IN FALLOUT"

Note by the Secretary

The General Manager and the Director of Regulation have requested that the attached report be circulated for consideration by the Commission at an early date.

W. B. McCool

Secretary

AEC 604/23

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Asst. GM-Plans & Prod.	14
Asst. Gen. Mgr. R&D	15
Asst. to the GM (Disarm)	16
General Counsel	17-21
Biology & Medicine	22
Compliance	23-29
Congr. Liaison	30
Public Information	31-32
Inspection	33
Licensing & Regulation	34-35
Military Application	36
Operational Safety	37
Peaceful Nuclear Expl.	38
Plans & Reports	39-40
Radiation Standards	41-43
D. C. Office	44-46
Secretariat	47-53

X. Mtl. S-3 - Radioactive Fallout
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ATOMIC ENERGY COMMISSION

RESPONSE TO DRAFT STATEMENT OF THE FEDERAL RADIATION COUNCIL "COUNCIL POLICY REGARDING IODINE IN FALLOUT," FRC WG/CR/8, 11/8/62

Report to the Commission by the Director of Regulation and the General Manager

THE PROBLEM

1. To consider the draft statement of the Federal Radiation Council, "Council Policy Regarding Iodine in Fallout," and to determine a Commission position regarding radioactive fallout from nuclear weapons tests and related matters.

BACKGROUND AND SUMMARY

2. For more than two years the Federal Radiation Council (FRC) has been pressed by the Joint Committee on Atomic Energy and others for definitive statements relating its recommendations on exposures of population groups to radioactive fallout from the testing of nuclear weapons. During the past year, representatives of different Federal agencies have expressed widely differing views on the subject.

3. Officials of the Public Health Service have advocated that such countermeasures as the substitution of dry milk for fresh milk or of stored feed for pasturage should be used to reduce the potential exposure to iodine-131 in areas in which it appears that the total intake for a 12-month period might otherwise exceed the top of Range II recommended for "normal peacetime operations" in FRC Report No. 2.

4. AEC officials have taken the position that the radiation protection guides recommended by the FRC do not appropriately define levels at which countermeasures against fallout should be taken.

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5. In the May 29, 1962 meeting of the FRC, "it was agreed that there was urgent need for additional guidance beyond that offered in the Council's Report No. 2." At the suggestion of the Department of Defense representative, the Working Group was directed to prepare, for early consideration by the Council, a statement providing advice and guidance to the Surgeon General of the Public Health Service "on the interpretation of iodine levels and its health implications." At the September 10, 1962 meeting of the Federal Radiation Council, the Working Group was instructed to continue its efforts to prepare a comprehensive report providing guidance in relation to fallout.

6. During the summer and fall of 1962 the Working Group considered eight drafts dealing with policy with respect to fallout. Work on a comprehensive report to explain the health implications of fallout was suspended on the insistence of some members of the group that specific operational guides for iodine-131 should be given priority. A draft, WG/CR/8, "Council Policy Concerning Iodine in Fallout," November 8, 1962 (AEC 604/71), was believed to represent a possible compromise between views of various members of the Working Group and was sent to members of the Council for comment.

7. The draft, WG/CR/8, briefly discusses the bases of earlier recommendations of the Council, the nature of the hazard from iodine-131, and differences between the control of potential exposure at the source (i.e., by preventing release of radioactive materials into the environment) and other means of control (e.g., control of foods or of feeds); places upon state and local health agencies the responsibility for taking protective measures (involving foods and feeds) against fallout, and outlines in a table guidance to be used specifically by such agencies in assessing the

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need for control action. Previously the FRC had, in effect, recommended that for normal peacetime activities the 12-month intake of iodine-131 by any group of small children should not average more than 36,500 micromicrocuries. The table in WG/CR/8 indicates that, for the situation in which the radioiodine exists in the environment from fallout (a situation in which it is beyond control at the source and hence required control of food or of the food chain), 12-month intakes of 10 times this amount are "acceptable, with slightly increased risk. Health risk from radiation exposure is less than or comparable to over-all effects associated with protective action." Above a 12-month intake of 365,000 μμc, protective actions involving feasible and available means of reducing exposure, applied at state and local levels, are indicated. The draft does not state what actions should be taken nor whether it is intended that such actions should be instituted after the intake in the area of concern has reached the level specified or should be taken earlier as may appear necessary to make it improbable that the level should be exceeded.

8. Letters (AEC 604/71) from the Department of Agriculture, the Department of Defense, the Atomic Energy Commission, and the Department of Labor have presented various reasons for recommending that the Council not concur in WG/CR/8 (at least, at the present time). The reply of the Atomic Energy Commission, December 26, 1962, was presented as an interim comment with the statement the Commission expects to present an alternative proposal in early 1963. A letter from the Department of Health, Education and Welfare, January 4, 1963, over the signature of Boisfeuillet Jones, urges approval of an "edited" version of the draft circulated by Working Group. The AEC member of the Working Group considers that the changes introduced by DHEW have changed the tone to one of worry and danger which makes the "edited" version less acceptable than the original draft.

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9. The highest 12-month intake characterized as acceptable in WG/CR/8 is almost 10 times the highest 12-month exposure (estimated for children drinking fresh milk) in the United States (Utah) as reported in the Annual Report of the AEC. It appears unlikely that, except possibly in the vicinity of the Nevada site, weapons tests which might occur in the foreseeable future would result in 12-month intakes of iodine in the United States 10 times as great as those observed in 1961-62.

10. Most of the numerical guides recommended by the FRC have been reasonably consistent with standards of radiation protection which have evolved over a period of 30 years, largely through the instrumentality of the International Commission on Radiological Protection and associated national groups such as the National Committee on Radiation Protection. While the distinction made in WG/CR/8 between guides applicable to control measures taken at the source and possible guides contemplating action with respect to the food supply is a valid one and has been emphasized by the Council in correspondence with the Joint Committee on Atomic Energy, the proposed factor of 10 in the relative numerical values proposed in the guide is supported only by the statement that below an annual intake of 365,000 μμc of iodine-131 the health risk from radiation exposure is less than or comparable to over-all effects associated with protective action. The nature of the problem is such that any recommendation in this field may be expected to be controversial. However, if the approach to the problem recommended in WG/CR/8 were to be found acceptable to the Council, the choice of factor and substantial support for the choice would require careful treatment. (Some support for this factor might be obtained from the following. In the case of occupational exposure to iodine-131,

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where there are different reasons for acceptance, the recommended dose limits are 20 times those recommended by the FRC for individuals in the general population. This ratio of 20 may be considered to be the product of a factor of 10 commonly used between occupational and population limits and an additional factor of 2 specifically provided by the FRC in its Report No. 2 to allow for possibly higher sensitivity of the thyroids of young children.)

11. Related British policies, which are not unequivocal, are discussed in Appendix "B".

12. The recommendations contained in the draft, WG/CR/8, are considered to be unacceptable. The basic objection is not concerned with whether or not levels at which action is proposed are too high or too low. In any event, the choice of such levels is highly arbitrary and subjective, possessing validity only to the extent that it represents the consensus of informed and responsible persons. The basic objection is to the assumption that, in an unpredictable course of events a meaningful action point can be established in absence of knowledge of the specific circumstances (particularly international pressures and military needs) at the time that levels of radioactivity might attain predetermined action points. It is not unlikely that, if the United States were to institute control measures to protect its own people against levels of radioactivity to which it had subjected the peoples of nations around the earth, some of whom do not consider our weapons testing to provide any compensating values for their exposure to fallout, the future freedom of the Government to make decisions related to the testing of nuclear weapons would be greatly reduced. If, on the other hand, it is deliberately intended to avoid such a possibility by establishing an action level

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so high that there is no danger of reaching it, one may question not only the meaningfulness of the action but the underlying motives.

13. There seems little or no doubt that the Federal Radiation Council must provide meaningful and acceptable guidance with respect to fallout or abdicate its responsibility. In view of past expression of views on the subject of possible countermeasures by the U. S. Public Health Service and the difficulties that the Council has had in dealing with fallout in the past, it is probable that the ability of the Council to deal satisfactorily with this question may depend in large degree upon leadership provided by the AEC member.

STAFF JUDGMENTS

14. The Divisions of Biology and Medicine, Compliance, Military Application, Operational Safety, Peaceful Nuclear Explosives, and Radiation Protection Standards and the Office of the General Counsel concur in the recommendation of this report. The Division of Public Information concurs in recommendation 16.d.

CONCLUSIONS

15. In view of these considerations and the further discussions in Appendices "A", "B", and "C" it is concluded that:

a. It would not be in the interest of the people of the United States for the Government to predetermine any level of fallout in the environment at which protective actions should be instituted.

b. Wide differences in the importance (absolute or relative) attached to various aspects of our nuclear weapons program, including possible hazards to health from fallout, military needs for weapons testing, and various aspects of international and domestic relations make it mandatory that the Government make every effort to insure a uniform interpretation of fact to resolve its internal differences, and to act under consistent policies.

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c. It is necessary that the President have continuously available a mechanism that can readily provide specific and adequate advice on questions involving fallout which takes into account all of the factors relevant to the problem under consideration, including exposure to radiation, current and possible future needs for weapons tests and the international climate. It is equally necessary that the President have a mechanism for coordinating those activities of executive agencies in which radioactive fallout is or should be an important consideration. Such mechanisms should be as closely related to the FRC as practicable. The possibility of a situation in which simultaneously the AEC and DOD are planning further weapons tests, the DHEW is advising state health departments to provide for countermeasures against fallout, and the State Department is protesting the hazards of fallout from Russian tests should be considered detrimental to the national interest.

RECOMMENDATION

16. The Director of Regulation and the General Manager recommend that the Atomic Energy Commission:

a. Adopt conclusions in a. b. and c. of paragraph 15 above as a statement of policy;

b. Approve transmittal of a letter such as Appendix "D" to the Federal Radiation Council;

c. Note that the JCAE will not be informed of this action;

d. Note that no issuance of a public announcement is necessary;

e. Note that this paper is unclassified.

LIST OF ENCLOSURES

		PAGE NO.
APPENDIX "A" -	Discussion.	8
APPENDIX "B" -	Staff Study	19
APPENDIX "C" -	Supporting Information.	27
APPENDIX "D" -	Draft Proposed Letter to FRC.	33

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APPENDIX "A"

DISCUSSION

1. Introduction - In considering the draft report, WG/CR/8, two kinds of questions arise. The first is concerned with levels of environmental contamination at which various decisions might justifiably be influenced by consideration of the hazards of fallout. Examples are decisions as to whether test series or specific tests proposed within a series are to be held; decision as to how, when and where the tests shall be conducted; and levels of radioactivity in the environment and in foods at which protective action might be taken to reduce human intake. The second kind of question is concerned with mechanisms by which appropriate guidance to persons who have the responsibility for making such decisions may be provided.

2. These kinds of questions are not completely separable. The view expressed in the Summary above is that levels of fallout which might appropriately affect decisions of the kinds enumerated can only be determined with adequate knowledge of the circumstances which obtain at the time that the decision is to be made. It is proposed to summarize in this Appendix the considerations that lead to this conclusion. More detailed discussions of some aspects of the problem are presented in Appendices "B" and "C".

3. The nature of radiation hazards - The principal biological effects with which we are concerned are reduction in life expectancy, leukemia, cancer, and genetic mutations.

4. Reduction in life expectancy is more closely related to general health and to aging than to diseases which may be produced by radiation. Reduction in the average life of a population of

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experimental animals exposed to radiation throughout their lives can be observed at average dose rates a few thousand times the normal dose rate from natural sources of radiation. If the dose rate is increased, the reduction in average lifetime is greater. If the dose rate is decreased to a few hundred times natural background, the decrease in average life span either becomes too small to observe or ceases to exist. (Reduction in life expectancy is also produced by large doses of radiation received in a short period of time. Such doses are more effective than if the same dose were received at lower rates over longer periods of time.)

5. Of a population of animals exposed to large doses of radiation, some fraction will develop leukemias. This fraction will depend upon the magnitude of the radiation dose received. In at least some species and strains of animals and for some types of leukemia, it also depends upon the rate at which the dose is delivered and upon characteristics of the animals exposed. As doses and dose rates to which different experimental population groups are subjected are reduced to a few hundred times those due to natural background, the number of cases of leukemia which occur is decreased to a point at which it becomes impossible to determine whether or not the radiation is producing any leukemias. This is because unirradiated animals also develop leukemias, and at such low levels of irradiation any differences in numbers which may be observed are too small to be statistically significant (i.e., are obscured by random variations in normal occurrence.) Similar statements apply to the production of cancer by exposure to radiation.

6. If either leukemia or cancer occurs, it is a serious disease. But the hazards of exposure to radiation cannot be

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measured only in terms of the kinds of effects which may be produced. If the probability of occurrence is sufficiently low, the hazard may be considered negligible.

7. The effects of genetic mutations become apparent only in subsequent generations. Mutations are of many kinds ranging from very serious physical and mental abnormalities to changes which represent no harm to the individual. As in the case of somatic effects, it becomes impossible to observe the genetic effects of radiation at low doses because they are obscured by variations in the normal occurrence of mutations unrelated to radiation. Geneticists generally believe, however, that even with the smallest doses of radiation, the production of mutations is proportional to the dose.

8. The fact that exposures to radiation from fallout which have occurred to date (excluding those at Rongelap) have been far below exposures at which we would be able to detect health effects with available techniques has led to considerable controversy over possible degrees of hazard. Estimates of somatic effects, variously characterized as conservative, cautious or pessimistic, have been made by assuming that the risk is proportional to dose over a range extending from zero to doses required to produce effects which can be determined with some confidence. There is reason to believe that the risk is less than estimated on this basis and some well-informed scientists believe that very small doses of radiation may not result in any increase in one or more of the somatic risks discussed above.

9. <u>The basis of radiation protection standards</u> - Our observations of the nature of radiation hazards have led us to make the cautious assumption that any exposure to radiation,

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however small, involves some small risk to future health; and that these risks are cumulative. In a world in which most of our activities involve risks which are large enough to be determined, there is no rational basis for suggesting that we avoid all exposure to man-made radiations. On the other hand, we do not generally have compelling reasons, in connection with experimental and industrial activities, to accept exposures to radiation sufficiently large to produce observable effects on health. Thus we are left with the problem of effecting some balance between a risk of uncertain magnitude and reasons for accepting the risk. The difficulty of making such a balance is increased by the fact that generally evaluation of reasons for accepting an exposure to radiation cannot be made with greater certainty than can the evaluation of the risk.

10. While we are limited in the confidence with which we can effect a balance between risk and reasons for acceptance of the risk in any particular case, it is probable that the radiation protection standards in current use represent a reasonable balance for average routine situations to which they are currently applied. This is because they are the product of three decades of evolution in which a balance has been effected by the interplay of all factors considered relevant by persons with various interests in the result.

11. Most of the radiation protection standards in current use have been formulated by the International Commission on Radiological Protection in cooperation with associated national groups such as the National Committee on Radiation Protection and Measurements. In a sence these groups have served as media for translation of the various pressures from special interests into relatively simple rules which can provide guidance for various sets of needs.

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12. It is frequently assumed that the formulation of radiation protection standards is a scientific activity. While the formulation of radiation protection standards must take into account all available knowledge of biological effects of radiation, as well as knowledge in related scientific fields, it involves so many factors outside the biological and physical sciences, some of which cannot be quantitatively evaluated, that no two groups of scientists, working independently, could be expected to reach the same conclusions.

13. The nature of current radiation protection standards - Contrary to a common concept, radiation protection standards in current use do not provide an answer to the question, "At what level does exposure to radiation become dangerous?" If one accepts the assumptions that, (1) any exposure to radiation, however small, involved some correspondingly small hazard, and (2) the hazard increases continuously with dose, the question has little meaning. Rather, one may ask in regard to any level of exposure such questions as, "How dangerous is the exposure?" "Are there reasons for the exposure which make it an acceptable risk?"

14. Questions of this sort have strongly entered the formulation of the radiation protection standards in current use. Although not explicitly stated, their recognition is evident in the basic report of the National Committee on Radiation Protection (NCRP) published ten years ago as National Bureau of Standards Handbook No. 59. It may be noted, however, that comparison of testimony by various members of the NCRP and ICRP and others in Hearings before the JCAE disclose marked differences of opinion as to the bases for exposure limits recommended by these bodies. The Federal Radiation Council (FRC)

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was quite explicit on this subject in its first Memorandum for the President, May, 1960, with such statements as,

> "(1) There should not be any man-made radiation exposure without the expectation of benefit resulting from such exposure ..."
>
> "(5) There can be no single permissible or acceptable level of exposure without regard to the reason for permitting the exposure ..."
>
> "(6) There can be different Radiation Protection Guides with different numerical values, depending upon the circumstances. The Guides herein recommended are for normal peacetime operations."

15. Two principal sets of radiation protection standards are in current use. One set deals with questions of exposure to radiation for occupational reasons. The other deals with questions of exposure of the general public to radiation as a result of scientific and industrial activities. Prior to about 1950, it was generally assumed that the rules used for limiting occupational exposures should be applicable to limiting exposure to members of the general public. With increased potential for release of radioactive materials into the environment, differences between the two cases have been given increasingly critical examination. We now recognize several reasons for limiting exposures of the general public to levels lower than those permitted persons exposed for occupational reasons. Some of these reasons are concerned with differences between the two classes of persons, while others concern themselves with differences in reasons for accepting a given risk. These various differences cannot be expressed quantitatively. The factor of ten in common use between occupational dose limits and those permitted members of the general public represents some effort to evaluate the combined weight of such factors, but it is of course highly subjective and extremely arbitrary.

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16. Neither the NCRP nor the FRC have been very specific as to the limitations of application of the maximum permissible doses or guides recommended for limiting exposure of members of the general public. It is clear, however, that various circumstances require special consideration. For example, the minutes of the most recent meeting of Executive Committee of the NCRP, December 17, 1962, one item off the Agenda, Proposed New Activities, consisted of 12 proposals, of which the following involved questions which might be considered to fall outside the area appropriately covered by existing radiation protection standards: "recommendations covering patients released from hospitals with radioactive material in their bodies"; "recommendations on emergency exposures under conditions of a major accident"; "recommendations on the contamination of food and water in civil defense emergencies," "recommendations on the exposure of persons under the age of 18," "recommendations on radiation exposure levels involved in the use of television for classroom teaching," and "recommendations on the occupational exposure of pregnant women."

17. It appears that radiation protection groups are increasingly recognizing the need to consider recommended radiation protection levels and practices in terms of conditions which lead to acceptance of the exposure. It is of interest that the United Kingdom has adopted guides for emergency exposures following a major accident which suggest that under such conditions a member of the general public might be permitted to receive from 15 to 100 times the radiation dose that would be permitted in one year from normal operations, as an alternative to such countermeasures as evacuation or confiscation of milk. Even so, some of these doses are not established as definite limits;

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for example, in suggesting a potential exposure which might justify evacuation, it is proposed that an actual decision to evacuate should also consider the hazards of evacuation.

18. One further set of recommendations by the NCRP is relevant to this discussion. In its Report No. 29, Exposure to Radiation in an Emergency, January 1962, it is made clear that in the case of nuclear war predetermined limits on exposures to radiation which might be permitted or accepted would have no validity. In a struggle for survival, no risk is too serious if there is no preferable alternative. In this case the only guidance that can be given is a description or table of the biological effects or risks associated with the various exposures to radiation which might be incurred following attack.

19. Control of Exposure to Fallout from Weapons Testing - Questions of control of exposure to fallout from weapons testing appear to arise in two different situations. First, there is the question of whether or not, or to what extent, weapons tests resulting in fallout should be held. Second, after the tests are held, and fallout has occurred, there is the question of what measures, if any, should be taken to avoid exposure of the population to radiation from the fallout. These two questions are not necessarily independent of each other. It appears extremely unlikely that the United States could take the position that the hazards from fallout are sufficiently serious to justify protective measures without seriously compromising all future decisions concerned with radionuclides in the environment. These decisions range from possible future requirements to test weapons for military applications, to the peaceful applications of nuclear explosions, to evaluating the severity of a possible accident, to policy decisions affecting the release of radioactive wastes to the environment.

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20. Possible effects on the future security of the nation, as well as on programs for the peaceful applications of nuclear energy, may be too high a price to pay to gain the degree of health protection that could be achieved by instituting countermeasures at levels of environmental contamination likely to result from stratospheric fallout. However, it is recognized that tropospheric fallout may result in local situations in which some countermeasures are desirable. Such possibilities require radiological monitoring programs adequate to reveal any such occurrence and a mechanism for prompt evaluation of relevant factors and decision.

21. Two alternatives exist: We can agree, as proposed in the FRC draft, WG/CR/8, on a fixed set of exposure levels at which the institution of protective measures would be expected to be more or less automatic; or we can agree that the impossibility of establishing meaningful action levels in advance of the specific situation to which they are to be applied makes it necessary to establish a mechanism for prompt evaluation of those factors relevant at the time, and make decisions on a case by case basis. Both of these alternatives involve potential problems of acceptance. In view of the foregoing discussion, only the second can provide reasonable assurance of decisions appropriate to the individual circumstances which may arise.

22. At the outset, the first alternative may be more readily accepted than the second, both because the Council would appear to be taking a definite position with respect to the hazards of fallout and because a fixed set of exposure limits would appear to answer such frequently asked questions as, "What is the danger point?" In short, such a position would appear consistent with a commonly held concept that there is some unique

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level, determinable on the basis of health considerations alone, that should not be exceeded. This acceptance may be short lived if the levels proposed for action are higher than the levels currently used as a basis for controlling the release of radioactive materials from industrial and scientific installations into the environment. While the use of higher levels is qualitatively logical and has been recognized by the FRC to be appropriate, any specific values that may be chosen are necessarily arbitrary and without the support of precedent. It may be recalled that during the past several years there have been public expressions of concern for levels of fallout lower than might be considered acceptable under radiation protection standards in use for normal peacetime operation. The FRC is potentially in a more favorable position because of participation of agencies with programmatic interests in health but not in the military aspects of national defense. However, its prestige is not impregnable.

23. While the second alternative would probably be subject to charges that the FRC is evading its responsibilities in refusing to establish, for the guidance of public health officers and others, maximum safe exposures, the principles upon which it is based might make it more defensible than the first alternative. Much would depend upon its presentation.

24. The problems discussed above are illustrative. Either alternative involves too many potential problems for inclusion in this discussion. It should be noted, however, that implementing the second alternative, which is supported in this report as being more meaningful, would require a great deal of doing to meet the purposes for which it is proposed.

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25. If the hazards of fallout are of sufficient concern to the American people to require guidance on possible protective measures against fallout, a question on which the American people may have the final voice; and if the implications of such measures may affect our national security, a question which the agencies most responsible for the national security must determine, the necessity for a mechanism to deal with questions of fallout as they arrive would seem to be clear.

26. Specifically, the proposal for a mechanism adequate to meet the needs of both health protection and national security envisages active participation by responsible representatives of agencies with major responsibilities in related areas. Most of these agencies are now members of the FRC, but no mechanism exists for providing them, as a group, with the information necessary for meaningful decisions on this type of question, nor has the executive branch of the government specifically recognized any real responsibility of the FRC in the area of fallout.

27. An essential adjunct to the effective operation of the FRC in this field would be a group capable of developing for review and decision at successive stages of responsibility semi-quantitative criteria for relating population exposures to other relevant factors of the problem to the extent necessary for prompt evaluation of situations which might be expected to arise.

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APPENDIX "B"

AEC STAFF STUDY REGARDING FEDERAL RADIATION COUNCIL POLICY ON FALLOUT

1. Implications of FRC Policy on Fallout from Nuclear Weapons Testing. The implications of any FRC statement regarding fallout from nuclear weapons testing must be evaluated in the light of its relationship to national security. The basic international position of the United States has recognized that the defense of the vital interests of democracy requires military strength great enough to deter aggression. The nuclear capability of the United States, at the present time, forms the basis of that strength in relation to the security of the Free World. The recent Cuban confrontation, where it became evident that not only the United States but the whole western hemisphere was about to be threatened with missiles armed with nuclear warheads based in the western hemisphere, is a graphic reminder of the severity of the threat to our present and future security inherent in the present international situation.

2. The development and testing of the weapons on which the security of the Free World is based could not be done without introducing some risk to the health of man on a global basis. The certainty of a very small and non-catastrophic effect on health is part of the price required to obtain this military strength and additional risks may be required to maintain it in the future. This necessary risk to health has been kept as low as practicable in the past and this policy will be continued in the future. Even though these risks may be so small that any possible effect will be unmeasurable, it is contrary to the moral code of the American people to impose on others any risk, no matter how

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small, that we, ourselves, are unwilling to accept. It is also contrary to the general practice in this country to create conditions that are so severe that protective actions must be taken in self-defense against the consequences. The sonic boom problem is not approached by requiring that all windows be made of shatter-proof glass, nor is the air pollution problem approached by introducing gas masks for general use by the public. Any proposed countermeasure program against fallout should be considered against this background.

3. The Role of Countermeasures. Countermeasures against fallout in the form of environmental controls and sanctions against food supplies might be undertaken for one of three reasons:

a. Prevent dangerous exposures

b. Eliminate unnecessary exposures

c. Minimize necessary exposures

The implications of each of these reasons will be considered in turn.

4. Instances of impaired health and death have been associated with radiation exposure or radionuclides in the body as the causative agent. Such instances were observed in the early application of radiation-producing devices in medical practice, and in the early experiences of industry, particularly those industries dealing with radium. Operational radiation protection standards were initially developed to allow the practitioners to avoid levels of radiation exposure capable of being identified directly with such consequences. Any condition in which the possibility of radiation exposure is greater than those levels which can be observed to be associated with injury can properly

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be considered dangerous from the standpoint of health and safety and countermeasures are justified to prevent actual radiation exposure from reaching such levels. Such conditions are met in practice only as the result of an accident. The incident of fallout on the Island of Rongelap and the reactor accident of Windscale are the two outstanding cases where such accidents occurred and countermeasures were taken. With the exception of the Rongelap incident, fallout from nuclear weapons testing has not represented this magnitude of challenge to health and countermeasures for this reason are not justified.

5. Countermeasures to eliminate unnecessary exposures. Traditionally, the biggest improvements in radiation protection have been obtained by placing major emphasis on techniques by which any unnecessary exposure could be eliminated from necessary operations which deal with radiation. The substantive improvements in dose reduction achieved in medical practice in the past five years has been brought about in this way. Similarly, the massive investment made by the Atomic Energy Commission in the development of engineering techniques for conducting its operations more safety has made it possible to continuously decrease the radiation exposures required. The development of techniques for testing weapons underground rather than in the atmosphere is a further noteworthy example of this principle. All of the offsite radiological protection activities conducted around Nevada may be justified in this way. Thus, the normal practices of washing off automobiles that have inadvertently become contaminated, the practice of evacuating certain people from limited areas for short periods of time, etc., were all done because the avoidance was feasible and acceptance of the exposure by the personnel concerned

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was not necessary to the success of the operation. None of these normal protective actions conducted in association with the operation were done to prevent a dangerous degree of exposure. However, a demonstration of an overt risk to health is not a requirement for undertaking a countermeasure on this basis.

6. The third reason for undertaking countermeasures is also closely linked to the management of those operations which cause exposures. As in the previous case, the greatest improvement in radiation protection is achieved through the primary source-management policies, not through attempting to correct the results. The transfer of the U.S. test series to the Pacific is a clearcut example of this principle. All of these actions are taken to prevent the development of fallout exposure conditions which would be dangerous to public health.

7. Since fallout from nuclear weapons testing is a necessary consequence of our own test program, one reason to undertake environmental controls would be to minimize such necessary exposures. If programs are undertaken for this reason, they should also be thoroughly coordinated and made a part of the test program. As in the case of eliminating unnecessary exposures, countermeasures programs undertaken for these reasons do not have to be tagged to any particular level of exposure or any specific predetermined limits. Different RPG's could be established for each individual shot, if this were in the best interests of the program. In principle, it is not relevant to base the requirement for such countermeasures to any specific level of health protection or "danger level."

8. Only one of these reasons for taking countermeasures against the consequences of a radiation-producing activity is

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based on a direct health requirement. Two are related to concepts of good practice in radiation technology and are often executed within the technology even when the associated health hazard is trivial.

9. However, the FRC members should all be aware of the fact that several countries, particularly European, have taken the position that their radiation protection practices will be based on the recommendations of the International Commission on Radiological Protection. For example, the United Kingdom has established the definite policy that all activities involving radiation exposure will comply with the recommendations of the ICRP, regardless of the cause. This implies that it is the national policy to limit radiation exposure from any cause to these levels, regardless of any demonstrated hazard or lack of it. Thus, the limit prescribed for the Windscale accident was 25 rems to the thyroid. This determination can be defended as reasonable since 25 rems is the "emergency exposure level" recommended by ICRP as one which could be accepted once in a lifetime by an industrial worker without entering it in the cumulative lifetime exposure record and implies that the radiation hazard is too low to be significant. Unofficial communication at the staff level indicated that the U.K. was prepared last spring to take countermeasures when the iodine-131 levels reached a consumption level equal to 130 μμc I-131 per day. This is the established level for non-emergency exposure, based on the ICRP recommendations. The plan was not put into effect because the I-131 levels in the U.K. never reached this point.

10. The basic policy decision to be made in regard to countermeasures and environmental controls appears to revolve around the following alternatives.

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Alternative A: It is the policy of the U.S. to limit possible exposures affecting the population from any cause to a predetermined maximum. Activities which lead to such exposure are enjoined to institute whatever regulations and environmental controls are necessary to see that these levels are not exceeded under non-emergency conditions. If an accident or unexpected condition arises which would be expected to cause exposure in excess of this maximum, all feasible actions will be taken to reduce possible exposures to the MPD as rapidly as possible.

Alternative B: It is the policy of the U.S. to undertake only those activities requiring exposure to radiation which yield definite benefits. It is the further policy of the U.S. to conduct these activities in such a way that the lowest radiation exposure which is practicably attainable is accrued.

The maximum protection to health and safety is to be found by focusing primary attention on the techniques for safely conducting radiation-producing activities.

Protection actions which involve sanctions against a non-contributing party will be taken only as necessary to prevent a dangerous degree of exposure, or when a positive health benefit commensurate with the total impact of the protection program can be realized.

11. Some countries which follow the recommendations of the ICRP, including the U.K. tend to follow the general philosophy of Policy Alternative "A", although the U.K. uses the direct assessment of hazard in developing its emergency exposure criteria. The U.S. has not yet adopted a general policy on this

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subject. Policy Alternative "B" is consistent with the general FRC position statement on iodine-131 from fallout, and the established general philosophy of radiation protection. (See Appendix "D", Item 1.) It should be noted that either policy can be applied to all programs, including the testing of nuclear weapons, but that the implementing programs are quire different.

12. The Role of Surveillance and Radiobiology Research. An environmental surveillance program is required to take those measurements which are needed to establish the radiation exposure levels to the population from environmental sources. The practical role it would be expected to play should be different under the two alternatives.

13. Under Policy Alternative "A", the role of surveillance would appear to be:

a. Determine the presence of radioactivity in the environment in concentrations corresponding to the MPD or more.

b. Trigger environmental control actions at predetermined action points.

The role of radiobiology would be to:

a. Improve the "dosimetry" concerned in the exposure evaluations.

b. Improve the biological basis of the MPD's.

14. Under Policy Alternative "B", the role of surveillance would appear to be:

a. Detect "dangerous" levels of radioactivity in the environment.

b. Support the source management program to insure that exposures are indeed as low as they can feasibly be made.

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The role of radiobiology would be to:

a. Establish the combination of radiation exposure and biological effect considered to be "dangerous."

b. Establish the technical basis for evaluating "degree of risk" as a function of exposure condition and biological vulnerability.

c. Improve the "dosimetry," particularly for radionuclides taken internally.

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APPENDIX "C"

SUPPORTING INFORMATION

The FRC discussions on radiation protection policy will involve many conflicting points of view. These will include: (1) Different views on the purpose of radiation protection and the relationship of radiation standards to activities involving radiation exposure and vulnerability to radiation injury; (2) The relationship between individual risk and risks affecting a large number of people; (3) The "tone" of explanations related to the hazards of radiation exposure. This appendix compiles some pertinent material covering these points.

Purpose

The fundamental purpose of radiation protection policy may be expressed as follows: (Based on L. Taylor)

> "Recognizing that procedures employing or producing radiation allow man to derive great benefits to health, as well as to his social well-being, his economic well-being and national strength and, at the same time, recognizing that any exposure to radiation may carry some hazard, the primary objective of radiation protection is to reduce the exposure of persons to the lowest practicable level commensurate with the social, medical, economic and national security benefits which are derived."

Radiation Protection Standards

MPD's and RPG's are an operational convenience to guide people who must deal with dangerous quantities of radiation in the development of practices which will result in an acceptable level of safety for themselves and for others. They do not relate to a dangerous degree of vulnerability to injury.

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Reference: Recommendations of the International Commission on Radiological Protection (Adopted September 9, 1958)

"Section B" - Basic Concepts

Permissible Dose

"(29) Any departure from the environmental conditions in which man has evolved may entail a risk of deleterious effects. It is therefore assumed that long continued exposure to ionizing radiation additional to that due to natural radiation involves some risk. However, man cannot entirely dispense with the use of ionizing radiations, and therefore the problem in practice is to limit the radiation dose to that which involves a risk that is not unacceptable to the individual and to the population at large. This is called a 'permissible dose'.

"(30) The permissible dose for an individual is that dose, accumulated over a long period of time or resulting from a single exposure, which, in the light of present knowledge, carries a negligible probability of severe somatic or genetic injuries; furthermore, it is such a dose that any effects that ensue more frequently are limited to those of a minor nature that would not be considered unacceptable by the exposed individual and by competent medical authorities.

"(31) Any severe somatic injuries (e.g., leukemia) that might result from exposure of individuals to the permissible dose would be limited to an exceedingly small fraction of the exposed group; effects such as shortening of life span, which might be expected to occur more frequently, would be very slight and would likely be hidden by normal biological variations. The permissible doses can therefore be expected to produce effects that could be detectable only by statistical methods applied to large groups."

Reference: United Nations Scientific Committee on the Effects of Atomic Radiation, 1962 - page 29, par. 9.

"With regard to irradiation received in the course of occupational exposure, the definition of 'maximum permissible doses' rests on the concept of a balance between the practical requirement for the work concerned and the limitation of the hazards involved. While appreciating the necessity in operational control of defining maximum permissible doses for groups of individuals in relation to particular circumstances, the Committee believes that the comparison of doses from various sources with maximum permissible doses valid for different circumstances is likely to be misleading here and would introduce considerations extraneous to the concept of risk, which is based on the appraisal of harmful effects only."

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Evaluations of Risk

1. National Academy of Sciences--BEAR Committee; "The Biological Effects of Atomic Radiation," Summary Reports, 1960.

   a. Genetic Effects: Page 4.

   "Because of the finding that genetic effects per unit of radiation dose received at a low dose rate might be less than previously estimated, the Committee has reconsidered its earlier recommendation. It is presumably safe to conclude that the estimates of the genetic effects of fallout radiation and of other radiation at similar low intensities should now be based on mutation rates at least as low as those found with chronic irradiation of mice. However, most of the man-made radiation to which the population of the United States is exposed involves dose rates not yet adequately investigated experimentally. For example, we do not know whether the effects of low doses given at high dose rates, as in medical exposures, will be more like the response from acute irradiation or more like that from chronic irradiation. In the future it may be desirable to relate maximum permissible exposures to dose rate as well as to total dose. But before this can be done, more information is needed at additional radiation intensities and for fractionated exposures. In the absence of such information, the Committee continues to recommend that for the general population the average gonadal dose accumulated during the first thirty years of life should not exceed 10 r of man-made radiation, and should be kept as far below this as is practicable. This is in essential agreement with the most recent suggestion of the International Commission on Radiological Protection."

   (Underscoring was added to the above-quoted matter.)

   (The FRC may find it wise to adopt this as an RPG for operational planning within the context of the definition of an RPG as given in FRC Report No. 1, page 3, paragraph 1.18. "Radiation Protection Guide (RPG) is the radiation dose which should not be exceeded without careful consideration of the reasons for doing so; every effort should be made to encourage the maintenance of radiation doses as far below this guide as practicable.")

   b. Committee on Pathological Effects: Pages 32 and 33

   "There are two notable instances of isotopes occurring in fallout that are much less concentrated in the gonads than they are in some other tissues, so that somatic damage might occur relatively in excess of genetic damage. Widespread contamination with strontium-90 or with radioactive iodine results, respectively, in radiation to the skeleton and nearby tissues and to the thyroid gland. These two isotopes are at present being measured in samples of foodstuffs,

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including milk which in Western countries appears to be the major vehicle for their uptake in man. Levels have been increasing in the past few years but remain well below those that need to be considered cause for alarm."

2. United Nations Scientific Committee on the Effects of Atomic Radiation, 1962

a. Page 34, paragraphs 34 and 35.

"The study of the relationship between dose and effect at cellular and subcellular levels does not give any indication of the existence of threshold doses and leads to the conclusion that certain biological effects can follow irradiation, however small the dose may be. When dose-effect relationships are studied at higher levels of organization, however, it is now being increasingly realized that the situation may be much more complex, since many factors play a part between the occurrence of the primary event and the final manifestation of radiation damage.

"During the interval since the last report, our knowledge of the somatic effects of radiation on man (those effects which are produced on the individuals exposed) has increased substantially with the demonstration of the induction of certain transient somatic effects by low doses of a few rad of radiation, and with the confirmation that embryonic tissues are more sensitive than many adult ones to injury by radiation. Even low doses may induce developmental disorders or malignant changes in embryos. Recent work has emphasized the complexity of radiation effects, and the importance of the qualifications that we made in our earlier report with regard to the numerical estimates of the frequency of the effects that would be caused by various doses of radiation. The complexity of the dose effect relationships is due largely to the fact that in different dose ranges, different types of biological effect may be produced, and a simple mathematical relationship is unlikely to apply. The data that have been accumulated since 1958 have neither proved nor disproved the assumption made in the first report that at low doses proportionality can be used to estimate risks."

b. Page 11, paragraphs 38 and 39.

"Assessment of the risk of carcinogenesis, including leukemia, at low doses of radiation requires a consideration of possible mechanisms of carcinogenesis.D 148-158 In the present stage of our knowledge, nothing can, however, be said about the mechanism of radiation carcinogenesis without indulging in speculation. Various hypotheses may be formulated to account for the induction of tumours by radiation. Somatic (gene or chromosome) mutation, the action of latent viruses, differentiation anomalies, are among the possible mechanisms through

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which radiation could give rise to malignancies. To show how different hypotheses might lead to different dose-effect relationships at low doses while giving similar responses to higher doses, two hypothetical mechanisms of induction of tumours by radiation will be discussed. These have no particular merit in themselves but are described for their simplicity and because they point out the possible fallacies involved in applying to low doses dose-effect relationships observed at higher doses.

"If radiation induced tumours through somatic mutation, it would be reasonable to expect proportionality between doses and corresponding incidence of tumours down to the lowest doses (no threshold). It is further conceivable that the number of tumours per unit dose may be less than anticipated at low doses, if the mutated cells are too few to develop a tumour. But it is also conceivable that with such a mechanism low doses might give a higher incidence of tumours per unit dose, since higher doses might kill the majority of mutated cells. Alternatively, it could be assumed that irradiation first involves general tissue damage and that the tumour only arises in the secondary stage of tissue repair. Again, there is the possibility that the production of tumour cells is due to somatic gene mutation, arising indirectly as a result of the increased proliferation that accompanies the repair process. There might thus be a critical level of radiation below which the damage would be too limited to stimulate, during the repair stage, proliferation of such an extent as to give an opportunity for the occurrence of a mutation."

Biological Risk and the Linear Hypothesis.

Exposure conditions which are high relative to known and observable effects are given more weight than exposure conditions which are low relative to these conditions in evaluating the possible degree of hazard.

Example: An exposure condition which could cause 10,000 people to receive an annual exposure of 100 rads would be considered more serious than a condition in which 100,000,000 people could receive an annual exposure of 0.1 R. The maximum risk per individual in the former case is 1,000 times the maximum risk per individual in the latter case and is 1,000 times closer to the known "danger lines" for both acute and chronic radiation damage, as well as genetic damage to the individuals affected.

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Given a requirement to conduct a weapons test program in the safest way possible compatible with meeting the requirements of the program, the Commission would elect to accept the latter condition, in preference to the former, despite the fact that the levels of both genetic and somatic effects that could be computed from the linear hypothesis is some 10 times larger. (i.e., $10^8 \times 10^{-1} = 10^7$ man rems vs $10^4 \times 10^2 = 10^6$ man rems.)

However, when any average (or maximum) exposure condition is stipulated (e.g., as an RPG), the size of the population at risk is important. Thus, a radiation condition capable of exposing 1,000 people at 10 rads in one year is preferred over one which could expose 100,000 persons at a level of 10 rads in one year.

Thus, it is Commission practice to limit <u>both</u> the magnitude of the possible exposures and the number of people exposed to the maximum practicable degree.

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APPENDIX "D"

PROPOSED LETTER TO THE FEDERAL RADIATION COUNCIL

1. In its letter to you of December 26, 1962, commenting on the Federal Radiation Council draft statement "Council Policy Concerning Radioactive Iodine in Fallout" (WG/CR/8), the Atomic Energy Commission expressed some reservations regarding the basic philosophy on which the draft was based. This letter outlines the Commission's evaluation of the problem and formulates its understanding of the policy issues to be settled.

2. A fundamental national policy issue regarding WG/CR/8, as understood by the Commission, is:

> Should the Federal Radiation Council's guidance on the possible health hazards of radioactive fallout from nuclear weapons testing include numerical guides to indicate when action should be taken to prevent exposure of the public?

3. In the Commission's view pre-determined numerical guides (Radiation Protection Guides) do not make a suitable instrument of national policy relating to radioactive fallout nuclides in the Nation's food supplies.

4. The Commission believes that national security decisions involving if, when and how, U. S. weapons testing is to be conducted should not be made independently of the possible degree of health hazard associated with the test. Similarly, decisions regarding possible health hazards should not be made independently of national security considerations, such as current and possible future needs for weapons tests and the international climate, which are relevant to the total problem of the national welfare. The Commission believes that this objective cannot be satisfactorily met by the establishment of predetermined numerical

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limits, but requires that the government establish a mechanism adequate to make prompt decisions on the basis of current information.

5. Decisions to undertake nuclear testing in the atmosphere made in the past are considered to have been required in the interest of national security. Although the long range health hazards of fallout, which have been under study by the AEC since 1948, have been among the factors considered, international and military factors have frequently appeared to be clearly dominant. The government may be faced with decisions of the same nature in the future.

6. Regardless of source control measures, the occurrence of some local and world-wide fallout is a concomitant of atmospheric testing. While it is the intent of the United States so to conduct its weapons testing programs as to minimize exposure to fallout, decisions by the United States must also take into account testing by other nations.

7. The level of acceptable risk from weapons testing cannot be determined independently of policy decisions made for reasons of national security based on conditions extant at the time. Not only is it impossible to evaluate the relevant factors in advance but, unlike routine industrial and scientific activities to which quantitative radiation protection guides are applicable, experience provides little precedent for predicting the maximum gravity of considerations that may need to be weighed against the hazards of fallout. It follows that whether or not the risks from fallout to be anticipated as the result of a proposed series of tests are acceptable must be determined by the current situation rather than by pre-determined numerical criteria.

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8. The question of whether pre-determined criteria can provide an appropriate and meaningful basis for decisions on possible action after fallout has occurred involves additional considerations. In the absence of policy determinations to the contrary, it appears necessary to make the following interrelated assumptions:

a. Only under the most serious conditions would the United States undertake weapons tests without reasonable confidence that resulting levels of fallout would be too low to justify protective action over a significant portion of the United States.

b. It is unlikely that the United States can take protective measures involving the control or treatment of food supplies and other agricultural products without adversely affecting its future freedom of decision on related questions. This would be especially true if measures were taken at levels comparable with those which have been experienced from world-wide fallout. Even action at much higher levels would be a basis for propaganda detrimental to the national interest.

c. In the event that tests involving a possible requirement for protective action against fallout in foods were found to be necessary, the government would desire to give this possibility full consideration at the time of the decision to test; and to inform the public of the possibility before, rather than after, tests were conducted.

d. Decisions to alter, or eliminate, some test in our own program based on health considerations must be made with full consideration of the fallout from the testing of all nations. Similarly, decisions to undertake a countermeasures program on a broad basis must include a judgment on possible or probable programs of all nations.

9. To the extent that these assumptions are valid, the question of levels at which protective action against fallout might appropriately be taken is inseparable from needs for weapons tests.

10. It is our view that all programs essential to national security should be conducted as safely as is practicable. In the case of fallout radioactivity, the maximum health protection is achieved by focusing attention on the elimination of unnecessary

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sources of exposure (e.g., possible reductions in numbers of tests and emphasis on non-atmospheric testing methods) and by conducting necessary atmospheric tests in such a manner as to minimize exposures to the greatest practicable extent.

11. On the basis of past experience, it appears unlikely that countermeasures might be required at any average levels of stratospheric fallout. However, it is recognized that in the case of tropospheric fallout local hot spots may conceivably occur in which some people might be subjected to exposures larger than those permitted from industrial sources but less than those which can be associated with observable effects. Radiological monitoring programs should be adequate to reveal any such occurrence and appropriate actions can be instituted on the basis of all relevant factors present at the time.

12. We believe that those objectives of the government, which involve fallout as one consideration, could best be achieved if there were continuously available within the government a mechanism for providing prompt, specific and adequate advice on the hazards of fallout developed with respect to a specific situation and reflecting such other considerations as current and possible future needs for weapons tests and the international climate, as may be relevant to the problem under consideration. It is equally necessary that the President have a mechanism for coordinating those activities of executive agencies in which radioactive fallout is or should be an important consideration. The executive branch of the government cannot afford to be in a position in which various agencies act independently and possibly at cross-purposes on matters considered to be of serious concern to the national welfare.

[redacted]

[redacted]

[redacted]

13. We believe that a mechanism designed to achieve these objectives should be as closely related to the FRC as practicable. However, wherever it might be placed in the executive structure of the government, its successful operation would require not only careful planning and effective staff support, but also the active participation of responsible officials of the various agencies interested in one or more aspects of the problem.

14. The purely technical information which must be available includes:

a. estimates of current exposure levels;

b. projections of future exposures from past tests, based on the stratospheric and environmental inventories;

c. estimates of anticipated biological effects or degree of risk, as these are related to various combinations of exposure conditions and biological vulnerability;

d. the reductions in exposure and in serious biological effects that could be anticipated through the institution of countermeasure programs;

e. risks to health and safety associated with proposed countermeasures; and

f. the direct costs and other economic impact of possible countermeasure schemes.

15. The types of policy considerations to which proposed actions must be related include:

a. U. S. requirements for weapons development and testing;

b. the way in which necessary tests are conducted;

c. the possible influence on U. S. military and economic policy; and

d. the possible influence on sensitive negotiations in such fields as the disarmament and test ban efforts.

[redacted]

[redacted]

[redacted]

16. The Commission believes that the FRC should recommend to the President procedures by which health and agricultural considerations can be properly incorporated into national security decisions and, in turn, assure that the national security considerations are properly reflected in health and agricultural policies and programs.

[redacted]

SECRETARY

~~SECRET~~

FEB 8 1963

JAN 2 2 1963

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER HAWORTH
COMMISSIONER PALFREY
COMMISSIONER RAMEY
Acting COMMISSIONER WILSON

THROUGH GENERAL MANAGER SIGNED, R. E. HOLLINGSWORTH

SUBJECT: FALLOUT PREDICTIONS FOR THE UNITED STATES IN 1963

Forwarded herewith for your information are predictions of the fallout situation in the United States in 1963 prepared by the Division of Biology and Medicine. These predictions are based on estimates of fallout from nuclear tests through December 1962. Reference to these predictions was made in the memorandum to you from the Division of Operational Safety, "Levels of Fallout in 1963," dated January 11, 1963.

CONFIRMED TO BE UNCLASSIFIED
DOE NSI DECLASSIFICATION REVIEW E.O. 13526
BY: [illegible] DOE/OC

Charles L. Dunham, M.D., Director
Division of Biology and Medicine

Enclosure:
Memo, Fuchs to Landecks dtd 2/4/63

SECRETARY

When separated from enclosures handle this document as ~~OFFICIAL USE ONLY~~
(Insert proper classification)

DBM Stanwood ADA Lough ADRP Dunham DIR

DOCUMENT TRANSMITTED HEREWITH CONTAINS ~~RESTRICTED DATA~~

FSB Klement:gb FSB Holland AGMRD AGM DGM GM

~~SECRET~~

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[redacted]

ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

This document consists of 1 pages
No. 23 of 45 Copies, Series A

CLASSIFICATION CANCELLED
BY AUTHORITY OF DOE/OC
Carl Wilson 4/17/84
REVIEWED BY DATE
J Dilts 9/13/95
By: TFelmer 9/11/96

TO: A.R. Luedecke, General Manager

FROM: Charles L. Dunham, M.D., Director
Division of Biology and Medicine

SUBJECT: FALLOUT PREDICTIONS FOR THE UNITED STATES IN 1963

In a memorandum through the General Manager to the Commissioners dated January 11, 1963, the Director of the Division of Operational Safety referred to a study under the cognizance of the Division of Biology and Medicine regarding fallout levels in 1963. It was indicated that the study would be more comprehensive than that transmitted by the December 4, 1963 memorandum of the Division of Operational Safety and, in particular, that it would "include additional information required to make estimates of radiation doses to persons both from external radiation and from internal emitters." Preliminary results of this study are transmitted herewith.

As you realize, the estimates of fallout for 1963 must be based on information regarding nuclear test yields of both the United States and the USSR in 1962. Data on the USSR tests, particularly for the detonations of December 1962, are still incomplete. We therefore do not feel that the present estimates are suitable for distribution outside the Commission. We are advised that substantially better yield information will be available about mid-February. Upon receipt of the revised yield data we plan to prepare new estimates. In addition to making these available within the Commission we plan to prepare an abstract suitable for transmission to the Joint Committee on Atomic Energy and to prepare a version for declassification review, for coordination with the Federal Radiation Council and for release to the public.

cc: GM
AGMA
AGMRD
Dir. DMA
Dir. DI
Dir. Class.
Dir. DOS
Dir. DPI
Dir. DPNE
Dir. ORS
[redacted]

OPTIONAL FORM NO. 10
5010-104

[redacted] ONLY

Reference Section

UNITED STATES GOVERNMENT

Memorandum

TO : Harold L. Price, Director of Regulation

DATE: February 7, 1963

FROM : W. B. McCool, Secretary

Original signed W. B. McCool

SUBJECT: EXTRACT OF ACTION SUMMARY OF MEETING 1911, WEDNESDAY, FEBRUARY 6, 1963, 2:50 p.m., ROOM A-410, GERMANTOWN, MARYLAND

SECY:MK

Commission Business

AEC 604/72 - U. S. Department of Labor Proposed Radiation Safety and Health Standards

Discussed.

The Chairman requested that AEC 604/72 be brought back to the Commission for consideration after consultation with members of the Labor Management Advisory Committee. (General Counsel/ Director of Regulation)

cc:
Commissioners

DF 209-13
#7

JNH-S-37

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

FEB 7 1963

Dear Nicholas:

This is in response to your letter to me of January 5, 1963, that presented results of some atmospheric conductivity observations made on the island of Guam. In your letter you attempted to correlate these results with nuclear weapons explosions conducted by the United States and Russia and ask, in the final paragraph, if your observations in late December could be attributed to an atmospheric test by the United States on December 28, 1962.

I should inform you first that the United States did not conduct a nuclear test in the atmosphere on December 28; the last such test conducted by us was in early November. The December 28 test referred to was by Russia and had a yield of about 20 megatons. This was only one of several nuclear tests conducted by Russia in the vicinity of Novaya Zemlya during the period December 23 through December 25; the magnitude of the other tests varied from the low yield range up to a few megatons.

Nuclear explosions can have an effect upon atmospheric conductivity near the ground provided there is fall-out from the radioactive clouds formed by the explosions. However, the effects do not account for your observation of a substantial reduction in the negative ion conductivity. On the contrary, radioactive material deposited on the ground produces an increase in the ionization and hence the conductivity of both signs in the lower atmosphere.

I am attaching a short article on the effects of radioactive debris on the electrical conductivity of the lower atmosphere that may be of interest to you.

67-23

I suspect that the results you observed were due to some local meteorological or other effects. It is possible, for example, that air pollution of some kind may have been responsible for the marked decrease in negative ion conductivity, although normally one would suspect a somewhat similar reduction in the positive ion conductivity. I suggest, therefore, that you attempt to correlate your data with local atmospheric conditions. I wish you success in your endeavors.

Sincerely yours,

(Signed) Glenn T. Seaborg

Chairman

Attachment:
Article on Atmospheric Electrical Conductivity Measurements (1 cy)

cc&cc: Raptou w/attach
2cc: Chairman w/o
cc: GMB/o
Rec: Secretariat w/o
5cc: Std DMA
cc: Director's Office

Ref: 3-00668 to Raptou

Mr. Nicholas S. Raptou
1, Mandrocleons Street
Vathy, Samos, Greece

MA:R&D	MA	AGM	DGM	GM
Gale/gb	Batts			
2/ /63				

DF 209.10
GenA

NATIONAL ACADEMY OF SCIENCES

OFFICE OF THE PRESIDENT
2101 CONSTITUTION AVENUE
WASHINGTON 25, D. C.

February 6, 1963

Dr. Glenn Seaborg
Chairman
Atomic Energy Commission
Washington 25, D. C.

Dear Glenn:

You will recall your letter to me of November 27 concerning the Atomic Bomb Casualty Commission at Hiroshima. I delayed answering since I planned to make a business trip to Asia in mid-December, partly with the intention of visiting the ABCC. During that visit I had an opportunity to talk to Ambassador Reischauer for perhaps an hour concerning the impact of the center upon the problems the Embassy faces in Japan. Since returning here I have been reviewing the over-all situation with Dr. Keith Cannan and have come to the conclusion that we ought to begin formulating a plan for the next five to ten years that would envisage some change in the formal way in which the ABCC is managed.

There is no doubt whatever that the study is one of the most valuable population studies at the clinical level ever made. For this reason it would be a grave mistake to do anything abrupt that would upset the smooth running of what is now a fine organization. The rich harvest of information is well worth both the expenditure of American dollars and the difficulties of a psychological-political nature we face at the present time. However, I do agree that we must see what can be done to effect a different pattern sometime in the future.

This entire subject will be brought up for discussion at the forthcoming Council meeting of the NAS-NRC on Saturday, February 9.

Sincerely yours,

Fred

Frederick Seitz
President

E 9-6-72

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : W. B. McCool, Secretary

DATE: February 4, 1963

THRU : H. L. Price, Director of Regulation

FROM : Forrest Western, Director
Division of Radiation Protection Standards

SUBJECT: AEC RESPONSE TO DRAFT STATEMENT OF THE FEDERAL RADIATION COUNCIL "COUNCIL POLICY REGARDING IODINE IN FALLOUT," FRC WG/CR/8, 11/8/62

It is requested that the attached report be reproduced for all interested Divisions and Offices and scheduled at the earliest available date for consideration by the Commission. The report deals with a problem to be considered by the Federal Radiation Council at a meeting scheduled for February 13, 1963. A proposed letter to the Chairman of the Council, if approved by the Commission and dispatched in advance of that date would provide other members of the Council an opportunity to consider the Commission's position prior to the meeting of the Federal Radiation Council.

Attachment:
As stated

62e 604/13

2-4-63

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Copy No. 11

February 26, 1963

ATOMIC ENERGY COMMISSION

SUMMARY NOTES OF COMMISSIONERS' MEETING WITH THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

Friday, February 1, 1963, 1:50 p.m., Room 1146
D. C. Office

Commissioners

Glenn T. Seaborg, Chairman
Robert E. Wilson
Leland J. Haworth
James T. Ramey
John G. Palfrey

General Manager

A. R. Luedecke

Director of Regulation

Harold L. Price

Secretary

W. B. McCool

Staff

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Merson Booth
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Joseph J. DiNunno
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Frank K. Pittman
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Advisory Committee on Reactor Safeguards

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Kenneth R. Osborn
Donald A. Rogers
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Reuel C. Stratton
Theos J. Thompson
Charles R. Williams
Dick Duffey
James B. Graham

copies filed:
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1. Draft ACRS Letter on Engineered Reactor Safeguards and Administrative Controls

Mr. Hall, Chairman of the ACRS, presented for discussion a draft letter prepared by the ACRS concerning the safety of the public from potential radiation hazards of nuclear power plants close to or within densely populated areas and the abatement of the potential hazards by means of "engineered safeguards" and "administrative controls". The letter had been written by an ACRS member in recognition of the need to require continuing professional integrity of vendors of critical reactor components. Mr. Hall, noting the importance of engineering design and review of design, expressed the belief that proper emphasis on administrative controls is essential because of the trend toward locating nuclear powered reactors near densely populated areas. Mr. Hall cited the need for a method of having public discussions on the matter to instill in the vendors the continuing sense of responsibility believed essential to assure that radiation is not released in harmful amounts. In reply to a question by Commissioner Ramey, Mr. Price said he had briefly reviewed the draft letter, but his staff has not had an opportunity to discuss its ramifications in detail. Mr. Hall inquired whether it would be beneficial for the Commission to receive the letter from the ACRS. Mr. Price said further study would be needed before a recommendation could be made on the desirability of the Commission's receiving the letter.

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Mr. Beck noted a matter of great importance implicit in the draft letter is the means of evaluating the adequacy of reactor safeguards in recognition of the assumption that increasing dependence must be placed on these safeguards as power plants are sited closer to metropolitan areas. In reply, Mr. Hall said greater emphasis would have to be placed on administrative control of the facilities to assure the abatement of risk. Mr. Palfrey observed that the issue raised by the ACRS will require continuing study over the forthcoming years. Mr. Ramey noted in his capacity as Executive Director of the Joint Committee on Atomic Energy he had attempted in the 202 Hearings in 1962 to create the impetus for appropriate research and development effort in this matter.

At this point, Chairman Seaborg entered the meeting.

Mr. Haworth said his first reaction to the draft letter is that it could be useful to the Commission because (1) it serves to make the Commission aware of the Committee's thinking and (2) it contains suggested courses of action on the safeguards issue.

Mr. Ergen noted that as engineering safeguards become perfected, the dominant risk would seem to spring from a deliberate by-passing of safeguards by a saboteur or a disgruntled employee as opposed to random accident. He said such an occurrence might possibly be a proper matter for Civil Defense authorities rather than the sole responsibility of the Commission.

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Mr. Hall noted the possibility that with the passage of years and almost commonplace use of nuclear power plants, a tendency toward deterioration of component integrity and administrative controls may develop. Mr. Ramey observed that the other Federal agencies have expressed similar concern.

In reply to a question by Mr. Palfrey, Mr. Newson said he believes "built-in" engineered safeguards could serve to off-set possible deficiencies in administrative controls. Correspondingly, administrative controls could serve as a counter-weight to possible engineered safeguards deficiencies.

Mr. Palfrey asked if consideration has been given to the possibility of the establishment of a variable system of controls over design, construction, and operation of nuclear power plants. Control would become more stringent as the plant is sited closer to densely populated areas. In reply, Mr. Hall said there is a natural tendency to control more closely the operation of power plants as they are sited closer to metropolitan areas. Mr. Hall said at present, however, there is no planned system of variable controls.

Mr. Silverman expressed the opinion that the efficiency of safeguards ultimately is directly traceable to the caliber of administrative personnel controlling plant operation. Mr. Kouts agreed.

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Mr. Palfrey suggested the possibility of requiring periodic renewal of reactor operating licenses in addition to the present requirement of license amendment when significant changes in reactor operation are undertaken. Mr. Wilson said the Division of Compliance is charged with the responsibility of periodic inspection of reactor operations. Mr. Ramey agreed but said he believes it is the function of the ACRS to make the Commission aware of problems of general concern in reactor operations. Mr. Rogers said that the Compliance Division is the first order of defense to assure that procedures for safe reactor operation are met. He alluded to that Division's large geographical areas of responsibility and increasing numbers of reactors compared with the relatively small number of Compliance personnel.

In reply to a question by Mr. Ramey, Mr. Silverman said the rate at which development on engineered safeguards can proceed is limited not so much by research funding as it is by a lack of highly skilled personnel. Mr. Silverman added funding has been provided for continued National Laboratory research and award of research contracts to universities and other outside institutions. Mr. Silverman said development and utilization of a typical containment vessel with controlled release is desirable. Present containment vessels have leakage within acceptable tolerances. He said it has been difficult to convince reactor operators of the desirability of such a containment vessel the development of which would be quite costly.

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Mr. Thompson said a Subcommittee report on safety research is in preparation. He said a considerable amount of early safety research had been performed under project funding. Mr. Thompson expressed the need for non-project-oriented safety research. He cited a recent and quite startling United Kingdom study on pressure vessels conducted by one Mr. Farmer, who is the official in charge of British reactor safeguards. These experiments, which require further corroboration, dealt with the temperatures and pressures at which brittle fractures of the vessels occurred as well as the extent and rate of expansion of the fractures. Mr. Wilson noted there had been an increase in FY 1964 funds for reactor safety over FY 1963 and suggested the use of obsolete reactors for possible safety study.

After further discussion the Chairman, noting the background developed by this discussion, said the Commission would advise the ACRS on the desirability of receiving the draft letter.

2. Safety Review of Aerospace Nuclear Projects

Mr. Hall introduced the matter of the ACRS role in the safety review of aerospace nuclear projects. He said the Committee is aware of the complicated nature of delineating the aerospace safety responsibilities of various agencies. Noting the responsibility of the AEC for the nuclear safety of devices, Mr. Hall said the ACRS is prepared to perform any appropriate review which the Commission might determine to place before it. He noted, however, that certain areas in the aerospace effort are basically a part of a National

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policy determination. For instance, in determining the scheduling of test events, certain calculated risks are considered. Mr. Hall said the ACRS would not be a proper body to assess safety hazards vis-a-vis the risks associated with early or late scheduling.

Mr. Palfrey said the matter of aerospace safety was analogous to the transmittal of classified information to other nations. In both cases certain calculated risks are recognized, but other overriding considerations of National policy may govern the need to accept these risks. He noted also that in both cases it is difficult to establish the limits of agency responsibility. In reply, Mr. Wilson stressed the Commission alone has been charged with statutory responsibility for the safety of nuclear devices.

Mr. Ramey, noting the Commission's responsibility for reactor safety, said the ACRS on its own initiative can advise the Commission concerning the safety of a reactor irrespective of whether it is owned by the Commission or by some other agency.

Mr. Hall reiterated the complexity of delineating agency responsibilities in the matter of aerospace safety. He said by way of example it might be desirable for the ACRS to review safety up to the time of vehicle launch. However, various questions associated with agency responsibility are presently unanswerable since establishment of such responsibility could possibly be dependent upon an after-the-fact determination of the location of the reactor at the time of occurrence of any reactor runaway.

In reply to a question by Mr. Ramey, Mr. Hall said,

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excluding legal considerations, the desirability of having the Committee pass on matters other than those related to civilian power reactors is presently dependent on the qualifications and opinions of individual Committee members.

Chairman Seaborg said the Commission had conferred with NASA and Air Force officials on January 15, 1963, in an exploratory luncheon meeting on aerospace safety matters. He said while no decisions were reached as a result of the meeting, it is evident the problem of aerospace nuclear safety involves several agencies. The representatives of the three agencies had left the meeting with the understanding that they and their respective staffs would initiate efforts to solve the general problem. Mr. Wilson said he believes an almost intolerable situation would be created if three separate committees were to pass on safety matters at vehicle launch. He said it might be desirable to enact legislation to create a Space Nuclear Safety Committee, and he noted that only in rare instances would aerospace reactors be operating near the earth's surface.

Mr. Gifford said he has still not seen the results of studies concerning the computations of radiation dosages to persons from aerospace reactors. Each agency associated with aerospace operations would have its own safety committee irrespective of the possible establishment of an overall committee. It would be difficult to merge these separate committees procedurally. The drucial requirement to be met is to provide an

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independent overall safety review by a technical body capable of evaluating the consequences of radiation dosage to the public. Mr. Wilson said he believes the establishment of an overall safety committee must precede any meaningful resolution of the problem, and Mr. Silverman said not all problems associated with aerospace safety are unique or without history. Mr. Thompson, referring to the problems associated with launch aborts, said he believes there should be a safety review well in advance of vehicle launch by one joint safety committee which is independent and authoritative. Mr. Hall said he believes any review should be independent of the individual safety reviews of present committees and should be performed by a group having no programmatic responsibilities.

Mr. Kouts said there is a need to have consistency in the aerospace safety review procedures relating to military necessity or National prestige and commercial application. These safety reviews should be broadly comparable to those conducted in the civilian power reactor program. Mr. Kouts said he believes it would be desirable for the AEC to oversee these reviews to assure their proper coordination.

Mr. Hall said while there are shades of differences in the opinions expressed by the ACRS members, the Committee as a whole would be happy to provide its professional competence to assist the Commission in fulfilling its responsibilities to the public.

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Mr. Gifford again expressed his concern about possible radiation exposure to the public, and he said study directed toward early resolution of the problem must be undertaken promptly since two aerospace nuclear devices are already in orbit. He reiterated the need for establishment of an independent group at an early date in order to have an independent review of nuclear space activities before they increase to any appreciable degree.

W. B. McCool
Secretary

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Copy No. 13

February 26, 1963

ATOMIC ENERGY COMMISSION

SUMMARY NOTES OF COMMISSIONERS' MEETING WITH THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

Friday, February 1, 1963, 1:50 p.m., Room 1146
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Copies filed:
MHB-3 Hazards from Power Reactors
O+M-7 ACRS

2-1-63

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excluding legal considerations, the desirability of having the Committee pass on matters other than those related to civilian power reactors is presently dependent on the qualifications and opinions of individual Committee members.

Chairman Seaborg said the Commission had conferred with NASA and Air Force officials on January 15, 1963, in an exploratory luncheon meeting on aerospace safety matters. He said while no decisions were reached as a result of the meeting, it is evident the problem of aerospace nuclear safety involves several agencies. The representatives of the three agencies had left the meeting with the understanding that they and their respective staffs would initiate efforts to solve the general problem. Mr. Wilson said he believes an almost intolerable situation would be created if three separate committees were to pass on safety matters at vehicle launch. He said it might be desirable to enact legislation to create a Space Nuclear Safety Committee, and he noted that only in rare instances would aerospace reactors be operating near the earth's surface.

Mr. Gifford said he has still not seen the results of studies concerning the computations of radiation dosages to persons from aerospace reactors. Each agency associated with aerospace operations would have its own safety committee irrespective of the possible establishment of an overall committee. It would be difficult to merge these separate committees procedurally. The crucial requirement to be met is to provide an

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independent overall safety review by a technical body capable of evaluating the consequences of radiation dosage to the public. Mr. Wilson said he believes the establishment of an overall safety committee must precede any meaningful resolution of the problem, and Mr. Silverman said not all problems associated with aerospace safety are unique or without history. Mr. Thompson, referring to the problems associated with launch aborts, said he believes there should be a safety review well in advance of vehicle launch by one joint safety committee which is independent and authoritative. Mr. Hall said he believes any review should be independent of the individual safety reviews of present committees and should be performed by a group having no programmatic responsibilities.

Mr. Kouts said there is a need to have consistency in the aerospace safety review procedures relating to military necessity or National prestige and commercial application. These safety reviews should be broadly comparable to those conducted in the civilian power reactor program. Mr. Kouts said he believes it would be desirable for the AEC to oversee these reviews to assure their proper coordination.

Mr. Hall said while there are shades of differences in the opinions expressed by the ACRS members, the Committee as a whole would be happy to provide its professional competence to assist the Commission in fulfilling its responsibilities to the public.

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Mr. Gifford again expressed his concern about possible radiation exposure to the public, and he said study directed toward early resolution of the problem must be undertaken promptly since two aerospace nuclear devices are already in orbit. He reiterated the need for establishment of an independent group at an early date in order to have an independent review of nuclear space activities before they increase to any appreciable degree.

W. B. McCool
Secretary

UNCLASSIFIED

January 28, 1963

CORRECTION NOTICE

COPY NO. 68

ATOMIC ENERGY COMMISSION

CORRECTION NOTICE TO AEC 604/72 - U.S. DEPARTMENT OF LABOR PROPOSED RADIATION SAFETY AND HEALTH STANDARDS

Note by the Secretary

On page 6, please change paragraph 19a. to read "Approve the conclusion in paragraph 17 above."

W. B. McCool

Secretary

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Public Information	36 - 37
Inspection	38
Licensing & Regulation	39 - 40
Operational Safety	41
Plans and Reports	42 - 43
Production	44 - 47
Radiation Standards	48 - 51
Raw Materials	52 - 53
Reactor Development	54 - 63
Manager, Naval Reactors	64
D. C. Office	65 - 67
Secretariat	68 - 74

E2-82-1

MHSB 3-Radiation

[redacted]

[redacted]

AEC 604/72

January 24, 1963

COPY NO. 68

ATOMIC ENERGY COMMISSION

U.S. DEPARTMENT OF LABOR
PROPOSED RADIATION SAFETY AND HEALTH STANDARDS

Note by the Secretary

The General Manager and Director of Regulation have requested that the attached report by the Office of the General Counsel be circulated for consideration by the Commission at an early date.

W. B. McCool
Secretary

AEC 604/72

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Asst. GM-Plans & Prod.	14
Asst. GM Operations	15
Asst. Gen. Mgr. R&D	16
General Counsel	17 - 24
Compliance	25 - 31
Congr. Liaison	32
Ind. Participation	33
Labor Relations	34 - 35
Public Information	36 - 37
Inspection	38
Licensing & Regulation	39 - 40
Operational Safety	41
Plans and Reports	42 - 43
Production	44 - 47
Radiation Standards	48 - 51
Raw Materials	52 - 53
Reactor Development	54 - 63
Manager, Naval Reactors	64
D. C. Office	65 - 67
Secretariat	68 - 74

SPECIAL REREVIEW FINAL DETERMINATION Class. Uncl.

Reviewers	Class	Date
Jose Diaz		12/8/80

By: W. Tauch 4/4/96

X-MHSB-Radiation Exposure
P3C-1-1 Reg. Radiation Protection Reg.

[redacted]

1-24-63

[redacted]

ATOMIC ENERGY COMMISSION

U. S. DEPARTMENT OF LABOR
PROPOSED RADIATION SAFETY AND HEALTH STANDARDS

Report to the General Manager and the Director of Regulation
by the Office of the General Counsel

THE PROBLEM

1. To formulate the position to be taken by the Commission in its comments to the Department of Labor on radiation standards proposed as additions to regulations under the Walsh-Healey Public Contracts Act.

BACKGROUND

2. The Department of Labor's Safety and Health Standards for Federal Supply Contracts promulgated under the Walsh-Healey Public Contracts Act and made effective January 27, 1961, prescribed standards with respect to numerous industrial conditions and hazards, but did not include radiation standards.* The prefatory statement to the regulations announced that radiation standards were being drafted. Proposed radiation standards, based largely on portions of 10 CFR Part 20, with some variations, were published in the Federal Register on August 17, 1962 (Appendix "A"). A meeting was subsequently held between the staffs of AEC and the Labor Department for an exploratory discussion of proposed comments by the AEC, and a letter dated October 16, 1962 (Appendix "B"), was sent to Labor, asserting the AEC's intention to submit comments. This paper contains the staff's recommendations for comments in the form of a proposed letter to the Labor Department (Appendix "C").

* As a matter of background information, a proposed agreement between AEC and the Department of Labor is under consideration at the staff level. Under this proposed agreement the AEC would, in certain of the contractor operated plants, undertake primary responsibility for inspection with respect to Walsh-Healey Safety and Health Standards. The plants to be covered under this agreement are basic production type operations.

[redacted]

[redacted]

[redacted]

SUMMARY

3. The Walsh-Healey Act provides that any contract made by an agency of the United States for the manufacture or furnishing of materials, supplies, articles and equipment in excess of $10,000 shall require, among other things, that no part of the contract will be performed nor will any of the materials, supplies, articles or equipment to be manufactured or furnished under said contract be manufactured or fabricated in any plants, factories, buildings, or surroundings or under working conditions which are hazardous or dangerous to the health or safety of employees engaged in the performance of the contract. The Secretary of Labor is authorized to make rules and regulations necessary to carry out the provisions of the Act.

4. The authority of the Secretary of Labor to issue the proposed standards does not appear subject to challenge. The Atomic Energy Act of 1954, as amended, does not abrogate the jurisdiction of other Federal agencies having statutory authority to regulate for purposes which incidentally extend to radioactive substances covered by the Act. The proposed regulation appears to meet the other requirements of a legally valid regulation, i.e., it is not inconsistent with the statute under which it is being issued, and is not in itself unreasonable or inappropriate.

5. The mission of the Labor Department in this area is not dissimilar in ultimate purpose from that of the AEC, i.e., the safeguarding of health and safety of individuals by requiring compliance with prescribed minimum standards. The jurisdiction of the Department is, of course, limited to the protection of workers employed in connection with certain Government contracts (rather than the general public).

[redacted]

[redacted]

6. The proposed standards will serve to fill an announced gap in the Labor Department's safety and health standards. The staff considers this objective desirable with respect to radioactive materials or radiation sources not within the jurisdiction of the AEC, such as radium, industrial X rays and cyclotron-produced isotopes, but questions the necessity of extending the standards to Commission licensees and contractors using source, byproduct and special nuclear material.

7. It should be noted that sanctions different from those which the AEC can impose may be applied under the Walsh-Healey Act. Violation of contractual provisions inserted in a contract pursuant to the Walsh-Healey Act gives the contracting agency the right to cancel the contract and to make open-market purchases or enter into other contracts for completion of the original contract, charging the additional cost to the original contractor. Probably more onerous to potential violators is the authority of the Secretary of Labor to blacklist a violator for a three-year period, thus preventing him from being awarded other Government contracts.

8. Government contractors who are Commission licensees are subject to 10 CFR Part 20, and violations of that Part may result in the revocation, suspension or modification of a license. Violations may be prohibited by court order, and willful violations are subject to criminal penalties.

9. Certain Commission contractors are exempt from AEC licensing requirements (and therefore from the requirements of Part 20) as follows: (1) persons operating Commission-owned plants and laboratories on behalf of the Commission (with respect to byproduct material), (2) persons acquiring or transferring

[redacted]

source material under contract with and for the account of the Commission, and (3) persons using special nuclear material under contract with and for the account of the Commission. Contractors to whom such exemptions are applicable are subject to the health and safety requirements of AEC Manual Chapter 0524, "Radiation Protection Standards." This Chapter and Part 20 are essentially uniform with respect to basic radiation standards. Proposed revisions of each will substantially reduce those differences which exist between them.

10. Under the standard AEC safety, health and fire protection contract clause, if a Commission contractor fails to comply with the applicable requirements of the Commission, the Contracting Officer may, without prejudice to any other legal or contractual rights of the Commission, issue an order stopping all or any part of the work. Of course, the ultimate remedy of contract termination is available to the Commission.

11. The staff is concerned over the possible adverse effect on Commission contractors and licensees who are Walsh-Healey contractors of the imposition of another set of regulations by another Federal agency in an area already comprehensively regulated or controlled by the AEC. Members of the general public, as well as Commission contractors and licensees, may react adversely to the imposition of what is essentially dual regulation. For example, concern has been expressed by the Atomic Industrial Forum (Appendix "D").

12. Even if the proposed standards are brought into conformity with Part 20 before being made effective, there is no assurance that non-conforming modifications will not be made subsequently. In addition, as revisions are made in Part 20 and Manual Chapter 0524 there is likely to be a time lag before the

changes are incorporated in the Labor Department's standards, if they are incorporated at all.

13. The most favorable resolution of the problem would be the specific exemption from the proposed regulations of Walsh-Healey contractors who are Commission licensees and contractors exempt from Parts 30, 40, or 70 using source, byproduct, and special nuclear material on the grounds that those materials are already regulated or controlled by the Commission so as to protect the health and safety of the public, including workers in atomic industry. It is recommended that the Commission's comments include a request for such an exemption.

14. It appears likely, however, that the Labor Department staff will be reluctant to thus restrict the scope of the regulations. They have indicated a willingness to consider a suggestion for inclusion in the proposed regulation of a provision stating that activities conducted by Commission contractors or licensees who are Walsh-Healey contractors in adherence to requirements established in connection with the Commission's contractual or regulatory authority shall be deemed to satisfy the requirements of the Labor Department's regulation. It is recommended that the Commission approve withholding agreement to this approach unless all reasonable efforts to obtain an exemption are unsuccessful.

15. It is also recommended that the Commission's comments suggest consideration of a similar exemption for the use of source, byproduct and special nuclear material regulated by states which are parties to agreements under Section 274 of the Act.

16. A number of specific corrections and changes in the proposed regulation would also be suggested to the Labor Department (Attachment to Appendix "C").

CONCLUSION

17. The staff concludes that the Commission should recommend to the Labor Department the specific exemption from the proposed Walsh-Healey Radiation Safety and Health Standards of Walsh-Healey contractors who are Commission licensees and contractors exempt from Parts 30, 40, or 70 using source, byproduct, and special nuclear material, and that consideration be given to a similar exemption for the use of source, byproduct and special nuclear material regulated by states which are parties to agreements under Section 274 of the Act.

STAFF JUDGMENTS

18. The Divisions of Licensing and Regulation, Radiation Protection Standards, Operational Safety and Labor Relations concur in the recommendation of this paper.

RECOMMENDATION

19. The Director of Regulation and the General Manager recommend that the Atomic Energy Commission:

a. Approve the conclusion in paragraph 17 above;

b. Note that the Secretary of Labor will be advised by letter such as Appendix "C";

c. Note that the JCAE will be advised by letter such as Appendix "E";

d. Note that a news release is not deemed necessary; however, the Commission's comments to the Labor Department will be placed on file in the Public Document Room; and

e. Note that this paper is unclassified.

LIST OF ENCLOSURES

		PAGE NO.
APPENDIX "A"	Reprint from Federal Register, August 17, 1962, Part 50-204 - Radiation Safety and Health Standards.....	8
APPENDIX "B"	Letter dated October 16, 1962, to the Administrator of the Wage and Hour and Public Contracts Divisions, Department of Labor, from Forrest Western, Director, Division of Radiation Protection Standards.....	10
APPENDIX "C"	Proposed Letter from Chairman to Secretary of Labor, U. S. Department of Labor.....	11
APPENDIX "D"	Letter dated October 10, 1962, from Atomic Industrial Forum, Inc., to Mr. Harold L. Price, Director of Regulation.....	20
APPENDIX "E"	Draft Letter to JCAE.....	21

[redacted]

APPENDIX "A"

U. S. DEPARTMENT OF LABOR
Wage and Hour and Public Contracts Divisions
Washington 25, D. C.

PART 50-204 - RADIATION SAFETY AND HEALTH STANDARDS

(Reprinted from the Federal Register of August 17, 1962)

Arthur J. Goldberg, *Secretary* — Clarence T. Lundquist, *Administrator*

DEPARTMENT OF LABOR

Division of Public Contracts

[41 CFR Part 50–204]

RADIATION SAFETY AND HEALTH STANDARDS

Safety and health standards for Federal supply contracts are expressed in 41 CFR Part 50–204. Radiation Standards are not among them because the requisite examination of the hazards involved in exposure to radiation was in progress when these regulations were promulgated. On the basis of this examination, I propose to establish the radiation standards hereinafter set forth.

Consideration has been given to the recommendations of the National Committee on Radiation Protection (National Bureau of Standards Handbooks 59 and 69) and the Radiation Guidance for Federal Agencies recommended by the Federal Radiation Council (25 F.R. 4402). The proposed standards are similar to pertinent parts of the Atomic Energy Commission's standards for protection against radiation (10 CFR Part 20). As the proposed standards are minimum standards for safe working conditions for employees engaged in the performance of Federal supply contracts, as required by section 1(c) of the Walsh-Healey Public Contracts Act, they do not include details as to generally recognized standards for safety practices or methods of determining compliance with the standards contained in these regulations. This does not detract from the desirability of complying with these other standards, nor will compliance with the standards expressed in these regulations relieve anyone from any obligation to comply with any more strict standard.

It should be noted that, to the extent these proposals may be adopted, their scope and application will be delineated by 41 CFR 50–204.1.

Now, therefore, pursuant to sections 1 and 4 of the Walsh-Healey Public Contracts Act (41 U.S.C. 35 and 38) it is hereby proposed that 41 CFR, Part 50–204 be amended by adding to the end thereof the centerhead and new sections set forth below.

Interested persons may submit written statements of data, views or arguments regarding the proposal. They should be filed with the Administrator of the Wage and Hour and Public Contracts Divisions, United States Department of Labor, Constitution Avenue and 14th Street NW., Washington 25, D.C., within 60 days after this document is published in the FEDERAL REGISTER.

The proposed regulations read as follows:

RADIATION

§ 50–204.305 Units of radiation dose.

(a) "Dose", as used in this part, is the quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body. When the regulations in this part specify a dose during a period of time, the dose means the total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time. Several different units of dose are in current use. Definitions of units as used in this part are set forth in paragraphs (b) and (c) of this section.

(b) The rad, as used in this part, is a measure of the dose of any ionizing radiation to body tissues in terms of the energy absorbed per unit mass of the tissue. One rad is the dose corresponding to the absorption of 100 ergs per gram of tissue. (One millirad (mrad) = 0.001 rad.)

(c) The rem, as used in this part, is a measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of one roentgen (r) of X-rays. (One millirem (mrem) = 0.001 rem.) The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions of irradiation. For the purpose of the regulations in this part, any of the following is considered to be equivalent to a dose of one rem:

(1) A dose of 1 r due to X- or gamma radiation;

(2) A dose of 1 rad due to X-, gamma, or beta radiation;

(3) A dose of 0.1 rad due to neutrons or high energy protons;

(4) A dose of 0.05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye.

§ 50–204.306 Exposure to radiation.

(a) Except as provided in paragraph (b) of this section, no employer shall permit any employee to receive in any period of one calendar quarter from any sources of radiation in the employer's possession or control, a dose in excess of the limits specified in the following table:

	Rems per calendar quarter
1. Skin, at basal layer of epidermis, of the hands, forearms, feet or ankles	18.75
2. Whole body	[1] 1.25
Gonads	1.25
Active blood-forming organs	1.25
Head and trunk	1.25
Lens of the eye	1.25
3. Skin of whole body	7.50

[1] For exposures of the whole body to X or gamma rays up to 3 thousand electron volts, this condition may be assumed to be met if the "air dose" does not exceed 1.35 roentgens provided the dose to the gonads does not exceed 1.25 rem. "Air dose" means that the dose is measured by an appropriate instrument in air in the region of highest dosage rate to be occupied by an individual without the presence of the human body or other absorbing and scattering material.

(b) Employees may receive doses to the whole body greater than those permitted under paragraph (a) of this section, provided:

(1) During any calendar quarter the dose to the whole body shall not exceed 3 rems; and

(2) The dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed 5(N–18) rems where "N" equals the individual's age in years at his last birthday; and

(3) The contractor maintains adequate past and current exposure records which show that the addition of such a dose will not cause the individual to exceed his age-prorated allowance.

(c) No contractor shall permit any employee who is under 18 years of age to receive in any period of one calendar quarter a dose in excess of 10 percent of the limits specified in the table in paragraph (a) of this section. (See also requirements of Hazardous Order No. 6 (29 CFR 4.57) issued pursuant to the Fair Labor Standards Act of 1938.)

§ 50–204.307 Exposure to airborne radioactive material.

No employer shall permit any employee to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in the following table, nor shall an employer permit any employee who is under 18 years of age to be exposed to airborne radioactive material in an average concentration in excess of 10 percent of such limits. The limits given are for exposure to the concentrations specified for 40 hours in any workweek of 7 consecutive days. In any such period where the number of hours of exposure is less than 40, the limits specified in the table may be increased proportionately. In any such period where the number of hours of exposure is greater than 40, the limits specified in the table shall be decreased proportionately.

[redacted]

CONCENTRATIONS IN AIR ABOVE NATURAL BACKGROUND

Element (atomic number)	Isotope [1]		Microcuries per milliliter (μc/ml)
Antimony (51)	Sb 122	S	2×10^{-7}
		I	1×10^{-7}
	Sb 124	S	2×10^{-7}
		I	2×10^{-8}
	Sb 125	S	6×10^{-7}
		I	3×10^{-7}
Argon (18)	A37	Sub [2]	6×10^{-4}
	A41	Sub	2×10^{-8}
Bismuth (83)	Bi 205	S	3×10^{-7}
		I	1×10^{-7}
	Bi 207	S	2×10^{-7}
		I	1×10^{-7}
	Bi 210	S	6×10^{-7}
		I	6×10^{-7}
	Bi 212	S	1×10^{-7}
		I	2×10^{-7}
Calcium (20)	Ca 45	S	3×10^{-7}
		I	1×10^{-7}
	Ca 47	S	2×10^{-7}
		I	2×10^{-7}
Carbon (6)	C 14	S	4×10^{-6}
	(CO_2)	Sub	5×10^{-4}
Cesium (55)	Cs 134	S	1×10^{-7}
		I	3×10^{-7}
	Cs 134m	S	4×10^{-6}
		I	6×10^{-6}
	Cs 136	S	4×10^{-7}
		I	1×10^{-6}
	Cs 137	S	5×10^{-7}
		I	6×10^{-7}
Cobalt (27)	Co 57	S	4×10^{-7}
		I	2×10^{-7}
	Co 58	S	2×10^{-7}
		I	2×10^{-7}
	Co 60	S	2×10^{-8}
		I	9×10^{-8}
Gold (79)	Au 195	S	6×10^{-7}
		I	2×10^{-7}
	Au 198	S	3×10^{-7}
		I	2×10^{-7}
	Au 199	S	1×10^{-7}
		I	8×10^{-8}
Hydrogen (1)	H3	S	6×10^{-6}
		Sub	2×10^{-6}
Iodine (53)	I 126	S	6×10^{-9}
		I	2×10^{-8}
	I 129	S	2×10^{-8}
		I	7×10^{-8}
	I 131	S	8×10^{-8}
		I	3×10^{-7}
	I 132	S	2×10^{-6}
		I	9×10^{-7}
	I 133	S	3×10^{-7}
		I	2×10^{-7}
Iridium (77)	Ir 190	S	2×10^{-7}
		I	1×10^{-7}
	Ir 192	S	3×10^{-7}
		I	2×10^{-7}
	Ir 194	S	2×10^{-7}
		I	2×10^{-7}
Iron (26)	Fe 55	S	9×10^{-7}
		I	1×10^{-6}
	Fe 59	S	1×10^{-7}
		I	6×10^{-8}
Krypton [1] (36)	Kr 85m	Sub	5×10^{-6}
	Kr 85	Sub	1×10^{-7}
	Kr 87	Sub	1×10^{-7}
Lead (82)	Pb 203	S	8×10^{-6}
		I	2×10^{-6}
	Pb 210	S	1×10^{-10}
		I	2×10^{-10}
	Pb 212	S	2×10^{-8}
		I	2×10^{-8}
Neptunium (93)	Np 237	S	4×10^{-11}
		I	1×10^{-10}
	Np 239	S	8×10^{-7}
		I	7×10^{-7}
Phosphorus (15)	P 32	S	7×10^{-9}
		I	8×10^{-9}
Plutonium (94)	Pu 238	S	2×10^{-11}
		I	2×10^{-11}
	Pu 239	S	2×10^{-11}
		I	4×10^{-11}
	Pu 240	S	2×10^{-11}
		I	9×10^{-11}
	Pu 241	S	4×10^{-9}
		I	2×10^{-11}
	Pu 242	S	4×10^{-11}
		I	4×10^{-11}
Polonium (84)	Po 210	S	5×10^{-10}
		I	2×10^{-10}
Radium (88)	Ra 223	S	2×10^{-9}
		I	2×10^{-10}
	Ra 224	S	8×10^{-7}
		I	7×10^{-10}
	Ra 226	S	2×10^{-11}
		I	5×10^{-11}
	Ra 228	S	7×10^{-11}
		I	4×10^{-11}

See footnotes at end of table.

CONCENTRATIONS IN AIR ABOVE NATURAL BACKGROUND—Continued

Element (atomic number)	Isotope [1]		Microcuries per milliliter (μc/ml)
Radon (86)	Rn 220	S	3×10^{-6}
		I	
	Rn 222	S	1×10^{-7}
Strontium (38)	Sr 85m	S	1×10^{-6}
		I	2×10^{-6}
	Sr 85	S	2×10^{-7}
		I	1×10^{-7}
	Sr 89	S	3×10^{-8}
		I	1×10^{-7}
Thallium (81)	Tl 200	S	3×10^{-6}
		I	1×10^{-6}
	Tl 201	S	2×10^{-6}
		I	9×10^{-7}
	Tl 202	S	8×10^{-7}
		I	2×10^{-6}
	Tl 204	S	6×10^{-7}
		I	3×10^{-6}
Thorium (90)	Th 228	S	9×10^{-10}
		I	6×10^{-10}
	Th 230	S	2×10^{-10}
		I	10^{-10}
	Th 232	S	3×10^{-11}
		I	3×10^{-11}
	Th natural	S	3×10^{-11}
		I	3×10^{-11}
	Th 234	S	6×10^{-9}
		I	3×10^{-8}
Uranium (92)	U 230	S	3×10^{-10}
		I	1×10^{-10}
	U 232	S	1×10^{-10}
		I	3×10^{-11}
	U 233	S	6×10^{-11}
		I	1×10^{-10}
	U 234	S	6×10^{-11}
		I	1×10^{-10}
	U 235	S	6×10^{-10}
		I	1×10^{-10}
	U 236	S	6×10^{-10}
		I	1×10^{-10}
	U 238	S	7×10^{-11}
		I	1×10^{-10}
	U-natural	S	7×10^{-11}
		I	6×10^{-11}
Xenon (54)	Xe 131m	Sub	2×10^{-6}
	Xe 133	Sub	1×10^{-6}
	Xe 135	Sub	4×10^{-6}

[1] Soluble (S); Insoluble (I).

[2] "Sub" means that values given are for submersion in an infinite cloud of gaseous material.

NOTE: In any case where there is a mixture in air of more than one radionuclide, the limiting values for purposes of the above table should be determined as follows:

1. If the identity and concentration of each radionuclide in the mixture are known, the limiting values should be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit otherwise established in the above table for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

EXAMPLE: If radionuclides A, B, and C are present in concentrations C_A, C_B, and C_C, and if the applicable maximum permissible concentrations are MPC_A, and MPC_B, and MPC_C respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{MPC_A}+\frac{C_B}{MPC_B}+\frac{C_C}{MPC_C}=1$$

2. If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of the above table shall be: 1×10^{-12} μc/ml.

3. If the conditions specified below are met, the corresponding values specified below may be used in lieu of that specified in paragraph 2 above.

Element (atomic number) and isotope	Air (μc/ml)
If it is known that alpha-emitters and Sr 90, I 129, Pb 210, Ac 227, Ra 228, Pa 230, Pu 241 and Bk 249 are not present.	3×10^{-3}
If it is known that alpha-emitters and Pb 210, Ac 227, Ra 228, and Pu 241 are not present.	3×10^{-11}
If it is known that alpha-emitters and Ac 227 are not present.	3×10^{-10}
If it is known that Ac 227, Th 230, Pa 231, Pu 238, Pu 239, Pu 240, Pu 242, and Cf 249 are not present.	3×10^{-11}
If Pa 231, Pu 239, Pu 240, Pu 242 and Cf 249 are not present.	2×10^{-10}

4. If the mixture of radionuclides consists of uranium and its daughter products in ore dust prior to chemical processing of the uranium ore, the values specified below may be used in lieu of those determined in accordance with paragraph 1 above or those specified in paragraphs 2 and 3 above.

1×10^{-10} μc/ml gross alpha activity; or 3.6×10^{-4} μc/ml natural uranium; or 76 micrograms natural uranium per cubic meter of air.

§ 50–204.308 Precautionary procedures.

(a) Every employer shall supply appropriate personnel monitoring equipment, such as film, badges, pocket chambers, pocket dosimeters, or film rings, to, and require the use of such equipment by:

(1) Each individual who enters an area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25 percent of the applicable value specified in paragraph (a) of § 50–204.306; and

(2) Each individual under 18 years of age who enters an area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 5 percent of the applicable value specified in paragraph (a) of § 50–204.306.

(b) Every employer shall make such surveys as may be necessary for him to comply with the regulations in this part. "Survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present.

§ 50–204.309 Records.

(a) Every employer shall maintain records of the radiation exposure of all individuals for whom personnel monitoring is required under § 50–204.308(a) and advise each of his employees of his individual exposure on request.

(b) Every employer shall maintain records in the same units used in the table in § 50–204.307 showing the results of surveys required by § 50–204.308(b).

§ 50–204.310 Application for variations.

(a) In accordance with the policy expressed in the Federal Radiation Council's memorandum concerning radiation protection guidance for Federal agencies (25 F.R. 4402), the Administrator of the Wage and Hour and Public Contracts Divisions may from time to time grant permission to employers to vary from the limitations contained in §§ 50–204.306 and 50–204.307 when the extent of variation is clearly specified and it is demonstrated to his satisfaction that (1) such variation is necessary to obtain a beneficial use of radiation or atomic energy; (2) such benefit is of sufficient value to warrant the variation, (3) employees will not be exposed to an undue hazard, and (4) appropriate action will be taken to protect the health and safety of such employees.

(b) Applications for such variations should be filed with the Administrator of the Wage and Hour and Public Contracts Divisions, United States Department of Labor, 14th Street and Constitution Avenue NW., Washington 25, D.C.

(Secs. 1 and 4, 49 Stat. 2036 and 2038; 41 U.S.C. 35 and 39)

Signed at Washington, D.C., this 10th day of August 1962.

ARTHUR J. GOLDBERG,
Secretary of Labor.

[F.R. Doc. 62-8202; Filed, Aug. 13, 1962; 8:45 a.m.]

Appendix "A"

[redacted]

APPENDIX "B"

October 16, 1962

Administrator of the Wage and Hour
and Public Contracts Divisions
United States Department of Labor
Constitution Avenue and 14th Street, N. W.
Washington 25, D. C.

Dear Sir:

Reference is made to Notice of Proposed Rule Making, 41 CFR Part 50-204, Radiation Safety and Health Standards, published in the Federal Register on August 17, 1962.

On October 12, 1962, AEC staff members from our Division of Radiation Protection Standards met with Messrs. Newman and Costello of the Department of Labor to discuss the coordination of Labor and AEC regulatory programs as they mutually relate to the proposed rule. The group discussed in particular the importance to the Commission of the inclusion of a waiver provision in the proposed rule stating that conformance with AEC license or contract requirements would be deemed to be in accord with 41 CFR Part 50-204.

We understand that while the expiration date specified in the notice for submitting comments is October 16, 1962; you have agreed to extend the time for AEC comments.

This letter will confirm that the AEC is preparing formal comments which will be submitted in writing in the near future. We look forward to a continuing close working relationship with your Agency in areas of mutual interest.

Sincerely yours,

Forrest Western, Director
Division of Radiation Protection
Standards

[redacted]

APPENDIX "C"

DRAFT LETTER TO SECRETARY OF LABOR

1. This is in further response to the notice of proposed rule making published in the Federal Register of August 17, 1962, on pages 8211 through 8213, proposing amendment of the Safety and Health Standards (41 CFR Part 50-204). The amendment extends the scope of existing Walsh-Healey safety and health standards to include radiation safety aspects and is therefore of particular interest to the Atomic Energy Commission. By letter of October 16, 1962, Dr. Forrest Western, Director, Division of Radiation Protection Standards, indicated that formal comments would be submitted by the Commission.

2. The statutory responsibilities of the Commission with respect to safeguarding the health and safety of the public, including workers, in connection with the possession and use of source material, byproduct material and special nuclear material, as defined, respectively, in Section 11 x., e. and y., of the Atomic Energy Act of 1954, as amended ("the Act"), 42 U.S.C. § 2014, are described in various sections of the Act. Congress made the finding that the processing and utilization of source, byproduct and special nuclear material must be regulated in the national interest and in order to protect the health and safety of the public. (Section 2 d., 42 U.S.C. § 2012). In the performance of its functions the Commission is authorized by Section 161 b., 42 U.S.C. § 2201, to establish by rule, regulation or order necessary or desirable standards and instructions to govern the possession and use of source, byproduct and special nuclear material to protect health and safety. Sections 53, 63 and 81 (42 U.S.C. §§ 2073, 2093, 2111) require the Commission to

consider health and safety aspects prior to licensing the possession or use of source, byproduct and special nuclear material.

3. In accordance with the Commission's statutory responsibilities, comprehensive standards for protection against radiation have been in effect under 10 CFR Part 20 since January, 1957. A copy of this document is attached. The regulations in that Part apply to all persons who receive, possess, use or transfer byproduct material, source material, or special nuclear material under a general or specific license issued by the Commission pursuant to the regulations in 10 CFR Parts 30, 40, or 70. In view of the Commission's statutory responsibilities described above, and the Commission's implementing regulations, the Commission recommends that AEC licensees who are Walsh-Healey contractors of AEC or other Government agencies be exempted from the application of the proposed amendment to 41 CFR Part 50-204. This would avoid the unnecessary burden and confusion created by the imposition of regulations of the same nature by more than one agency of the Federal Government.

4. Certain Commission contractors are exempt from 10 CFR Parts 30, 40 and 70 (and, consequently, from the requirements of Part 20). The following exemptions are provided: (1) persons operating Commission-owned plants and laboratories on behalf of the Commission are exempt from Part 30; (2) persons acquiring or transferring source material under contract with and for the account of the Commission are exempt from Part 40; (3) persons using special nuclear material under contract with and for the account of the Commission are exempt from Part 70. Radiation health and safety controls are imposed on these contractors by the Commission through contract clauses and the contractors are required to adhere to AEC Manual Chapter 0524, a copy of which is

attached. This Chapter and Part 20 are essentially uniform with respect to basic radiation standards. In view of this extensive contractual control, the Commission also recommends that Commission contractors who are exempted from licensing requirements by 10 CFR Parts 30, 40, or 70 be exempted from the application of the proposed amendment to 41 CFR Part 50-204.

5. The Commission is in full accord with the desirability of applying appropriate standards under the Walsh-Healey Act to the use of radioactive materials other than source, byproduct and special nuclear material, such as radium, industrial X rays and cyclotron-produced isotopes.

6. Under Section 274 of the Atomic Energy Act of 1954, as amended, the Commission is authorized under certain conditions to enter into agreements with State governments to transfer regulatory authority over source and byproduct material and special nuclear material in quantities not sufficient to form a critical mass, from the AEC to the States. To date the Commission has entered into agreements with the States of California, Kentucky, Mississippi, New York and Texas to transfer such regulatory authority. Prior to entering into an agreement the AEC is required to make a finding that the State's regulatory program for regulation of materials covered by the agreement is compatible with that of the AEC and is adequate to protect the public health and safety. The "agreement" States' regulatory programs were, therefore, considered to be compatible with the program of the AEC and adequate to protect the public health and safety at the time the arrangements were made, and the agreements provide that the States will exert their best efforts to maintain continuing compatibility. You may wish to consider whether an exemption similar to that suggested with respect to AEC licensees and

[redacted]

contractors exempt from 10 CFR Parts 30, 40, or 70 should be made applicable to Walsh-Healey contractors whose use of source, byproduct and special nuclear material is licensed by agreement States.

7. The Commission would appreciate an opportunity for further discussions between our staffs before a decision is made on the final version of the regulation.

8. You may also wish to consider suggested changes in a number of specific items in the proposed regulation, as set forth in an attachment to this letter. They are recommended not as a substitute for the proposals made above, but rather as refinements to render the application of standards used by our two agencies as nearly identical as practicable. Our staff will be pleased to discuss these matters in greater detail if you deem it desirable.

[redacted]

ATTACHMENT TO APPENDIX "C"

SPECIFIC COMMENTS

Section 50-204.305 Units of Radiation Dose

(a) Since the dose units in paragraphs (b) and (c) of this section apply to ionizing radiation, it is suggested that the centerhead be changed from "RADIATION" to "IONIZING RADIATION", and that the references to "radiation" in Section 50-204.305(a) be preceded by the word "ionizing."

(e) It appears appropriate to include in this paragraph the table of neutron flux dose equivalents found in 10 CFR 20.

Section 50-204.306 Exposure to Radiation

(a) It is recommended that the phrase "no employer shall permit any employee to receive . . . a dose . . ." be modified to recognize that the employer cannot control all accidental exposure. Otherwise, it may not be possible for the employer to be in literal compliance with this regulation.

It is suggested that a definition of "calendar quarter" similar to that in 10 CFR 20.3(4) be included.

It is not clear whether this paragraph applies only to external radiation or whether it is intended to apply

[redacted]

to the total dose received from external and internal sources. The limits specified in 10 CFR 20.101 refer only to external radiation.

It is suggested that the table of this paragraph be changed to reflect the Federal Radiation Council's values. Only one limit should be stated for whole body, gonads, active blood-forming organs, head and trunk, and lens of the eye, since the present listing suggests that these may be exposed separately in accumulative fashion.

"3." is missing in front of "skin of whole body."

Under "1." of the table it appears that the reference to skin at basal layer of epidermis is incorrectly used and that the heading should say "hands and forearms; feet and ankles."

The footnote should apply to the entire table and not merely to the whole body limit. Also, in the footnote, the phrase "3 thousand electron volts" should read "3 million electron volts."

It is suggested that the definition of "air dose" be appropriately amended, since, in the use of "air dose"

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as an estimate of absorbed dose, due consideration should be given to the effect of presence of the body or other objects.

Incidentally, one matter which the AEC staff has under consideration at the present time, in which you might be interested, is a proposed revision of 10 CFR 20, to provide for more flexible quarterly dose limits to individuals' extremities and skin, with no change in the annual limit. The adoption of this revision would change the section of Part 20 corresponding to your proposed Section 50-240.306.

(b)(2) It is recommended that the term "occupational dose" be defined. It appears that this paragraph is the only usage of "occupational dose" in the proposed standards.

(a), (b)(3), (c) The terms "employer" and "contractor" are used somewhat interchangeably throughout this entire standard. It is suggested that only one term be utilized and that this term be defined.

(b)(4) It is suggested that the following new subparagraph be added to the proposed standards:

> "Dose to the whole body" shall be deemed to include any dose to the whole body, gonads, active blood-forming organs, head and trunk, or lens of eye.

It is recommended that an exemption for the use of ionizing radiation for medical and dental diagnosis and therapy be stated in this section, unless "occupational dose" is defined in the proposed standards as suggested above.

[redacted]

Section 50-204.307 Only 76 radionuclides are listed in the table in this section. In our experience, it has been difficult to predict which radio-elements may be of interest in the rapidly developing atomic energy industry. We recommend that all the nuclides listed in Table I, Column I in Appendix B of 10 CFR 20 be included. However, if the Department of Labor considers such a list to be unduly long, we suggest, as a minimum, the addition of the following elements to your table: actinium, berkelium, beryllium, bromine, californium, cerium, chromium, protoactinium, ruthenium, sodium, strontium (90, 91, 92), sulfur, zinc and zirconium.

Under the example in note 1 to the table, the formula should read ≤ 1 rather than = 1.

It is recommended that the units be added to the limit under note 2 to the table which should read 1 x 10^{-12} uc per ml. Note 5 of the table in 10 CFR Part 20 is missing from this table and should be included.

Section 50-204.308 Precautionary Procedures

(a) The extraneous comma between "film" and "badges" should be removed.

The previous exposure limits apply to employees. It is suggested that "employee" be substituted for "individual" in (1) and (2).

It is felt that the term "area" is used too loosely, since the employer can only control his own area. 10 CFR 20.202 refers to "restricted area" which is defined in 20.3(14); it is suggested that a modification along similar lines be made in the proposed standards.

Section 50-204.309

It is recommended that the word "annually" be added to paragraph (a) to place a specific limitation on employee requests for radiation exposure experiences. It would be appropriate to insert a provision requiring notification of the employee in case of overexposure.

[redacted]

APPENDIX "D"

ATOMIC INDUSTRIAL FORUM INC.

850 THIRD AVENUE · NEW YORK 22, N.Y. · PLAZA 4-1075

October 10, 1962

Mr. Harold L. Price
Director of Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Hal:

I was sorry to learn last week when I visited Washington that you were recently hospitalized because of a deficient appendix. Now that the deficiency has been removed, I hope that you are well.

During the last few weeks, ever since publication by the Department of Labor of its radiation safety regulations under the Walsh-Healy Act, I have been besieged with inquiries concerning the possibility of dual inspection by the AEC and the Department of Labor. Nucleonics Week, several weeks ago, published an article indicating that it was likely that the AEC inspectors would perform the necessary inspection under the Walsh-Healy Act on behalf of the Department of Labor. Is this true? If not, what arrangements, if any, are being made to minimize the complications of dual inspection?

Best wishes.

Sincerely yours,

Gerald Charnoff
Legal Projects Manager

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APPENDIX "E"

PROPOSED LETTER TO JOINT COMMITTEE ON ATOMIC ENERGY

Attached for your information are the Commission's comments to the Department of Labor on radiation standards proposed as additions to regulations under the Walsh-Healey Public Contracts Act.

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AEC 604/71

January 14, 1963

COPY NO. 63

ATOMIC ENERGY COMMISSION

FEDERAL RADIATION COUNCIL

Note by the Secretary

The Director of Regulation has requested that the following enclosures be circulated for the information of the Commission:

Enclosure I - Letter of December 26, 1962 from Dr. Seaborg to Anthony J. Celebrezze, Chairman, FRC;
Enclosure II - Proposed FRC Statement, "Council Policy Concerning Radioactive Iodine in Fallout";
Enclosure III - Reply of January 4, 1963 from Boisfeuillet Jones, Special Assistant to the Secretary, Department of Health, Education, and Welfare;
Enclosure IV - Reply of November 29, 1962 from Roswell Gilpatric, Deputy Secretary of Defense;
Enclosure V - Reply of November 28, 1962 from Orville L. Freeman, Secretary, Department of Agriculture; and
Enclosure VI - Reply of December 21, 1962 from John C. Donovan, Special Assistant to the Secretary, Department of Labor.

AEC 604/71

W. B. McCool

Secretary

DISTRIBUTION	COPY NO.	DISTRIBUTION	COPY NO.
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General Manager	9-10	Licensing & Regulation	35-36
Deputy Dir. of Regulation	11	Military Application	37
Deputy Gen. Mgr.	12	Operational Safety	38
Asst. Gen. Mgr.	13	Operations Analysis	39
Asst. GM-Plans & Prod.	14	Peaceful Nuclear Expl.	40
Asst. GM Operations	15	Production	41-44
Asst. Gen. Mgr. R&D	16	Radiation Standards	45-49
Asst. Gen. Mgr. Adm.	17	Reactor Development	50-58
General Counsel	18-22	Manager, Naval Reactors	59
Biology & Medicine	23	D. C. Office	60-62
Compliance	24-30	Secretariat	63-68

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ENCLOSURE I

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

December 26, 1962

Dear Mr. Celebrezze:

The draft statement on "Council Policy Concerning Radioactive Iodine in Fallout" (WG/CR/8), forwarded November 9, 1962 by the Chairman of the Working Group to members of the Council for comment, is under study by members of the Atomic Energy Commission staff. While our consideration of the draft is not complete, the following comments are submitted at this time in the hope that they will contribute to the progress of the Council.

It is unlikely that the Atomic Energy Commission will concur in this draft. One of our major difficulties is with the assumption that in areas bearing so directly on questions of national defense and international position, the government should attempt to control exposures to radiation on the basis of a single set of more or less arbitrary numbers fixed in advance of knowledge of need for exposure.

Urgency for specific guidance on radioactive iodine in fallout has greatly decreased since last May, at which time the Working Group was directed to prepare a statement on this subject for consideration by the Council. However, there is no less urgent need for development by the Council of general guidance on fallout, as promised in its press release of September 10. To avoid hasty decisions, such guidance must be formulated and published before the occurrence of renewed public concern over rising levels of fallout. Guidance provided by the Council may also be expected to receive better acceptance if published before such concern develops. A necessary first step in the development of such guidance is further clarification, by the Council, of principles generally applicable to fallout.

Fallout of iodine-131 from the major test series of the past year is essentially complete, although there may be some added amount from the recent flurry of Russian tests. However, on the basis of past experience, we expect maximum rates of fallout of strontium-90 and cesium-137 from tests since September 1961 to occur in the spring of 1963.

We are engaged in the development of a proposal dealing with the more general question of the policy of the federal government with respect to fallout from tests. We expect to submit the proposal to the Council early in 1963, after which we would appreciate an opportunity to discuss it in a meeting of the Council. Hopefully, from such discussion, the Council would develop policy guidance for the staff in preparing an appropriate statement on this subject.

Sincerely yours,

/s/Glenn T. Seaborg

Honorable Anthony J. Celebrezze
Chairman
Federal Radiation Council
718 Jackson Place, N.W.
Washington 25, D. C.

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ENCLOSURE II

RADIATION PROTECTION GUIDANCE FOR FEDERAL AGENCIES

Council Policy Concerning Radioactive Iodine in Fallout

This statement is being issued by the Federal Radiation Council to provide guidance to Federal agencies in conjunction with their radiation protection activities related to radioactive iodine in the environment from fallout.

In 1960 and 1961, the Federal Radiation Council recommended guidance for controlling the exposure of industrial workers and the public from radiation resulting from operations in the nuclear industry. In reaching these recommendations, the Council recognized the responsibility for defining measurable criteria within which the peaceful applications of nuclear energy could be safely developed. These permissive exposure guides, as given in the Council's first two reports, "Background Material for the Development of Radiation Protection Standards," were, and still are, considered to represent health risks so low as to be compatible with the natural development of society for generations to come. The philosophy on which these Guides were founded is in consonance with the philosophy of radiation protection as it has been developed over the past three decades by the National Committee on Radiation Protection and Measurements and the International Commission on Radiological Protection.

More recently, with increases in the amount of radioiodine from fallout appearing in the environment and food supplies of man, there has been concomitant interest in considering the need or desirability for instituting precautionary actions against exposure from this source of radiation. In protecting health, primary concern is directed toward the magnitude of exposure, its potential consequences compared to the radiation dose

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believed to produce medically significant injury, and the possibility of undesirable consequences associated with alternative measures which might be initiated to reduce potential exposure.

Iodine, radioactive and non-radioactive, characteristically tends to concentrate in the human thyroid. Radioactive iodine has the same biological effect on the thyroid regardless of the specific source of the iodine; as a medically indicated tracer administered for diagnostic purposes; from a plant using or processing nuclear reactor fuels; or from tests of nuclear devices.

In considering health implications of thyroid irradiation, consultants to the Federal Radiation Council have concluded that radiation dose many times higher than the Radiation Protection Guide for the thyroid would be necessary to produce a detectable increase in adverse health effects --- specifically, thyroid cancer. Other biological effects, either somatic or genetic, are believed to be quantitatively even less important.

When sources of potential exposure which cannot be controlled at the point of origin are involved, and other means of exposure control may be indicated, full consideration must be given to the direct and indirect effects of such measures on the public, health, agriculture, industry and government. Such actions should be considered when it is believed that inherent health risks of a specific precautionary measure are less than potential health risks due to the exposure, but action should be instituted only when the total impact of the measure is less than the health risk due to exposure.

Radiation exposure from fallout from nuclear weapons tests in the range of existing guides for industrial application involves risks so slight that control measures may have a net adverse, rather than favorable, effect on public well-being. The Council

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believes that in situations where source control is practicable, the Guides should be applied as originally promulgated. In situations not subject to this control, however, such as resultant from fallout, it is consistent with the general philosophy of Radiation Protection Guides to use different criteria in determining when specific precautionary measures should be instituted. For example, guidance designed to limit the controllable release of radioactive material into the environment are appropriately much lower than levels at which detectable health effects may result.

The Federal Radiation Council therefore recommends that the guidance outlined in the accompanying table be used specifically in assessing the need for control action for exposures from radioiodine in the environment due to the testing of nuclear weapons.

This guidance is intended for administrative use by Federal agencies in planning and implementing radiation protection programs in connecting with radioactive iodine in fallout. Federal agencies are requested to provide assistance to State and local agencies in accordance with the guidance of the Council and to apprise the Council of their activities in this area.

As desirable as many believe it would be for the Council to designate specific control measures, it acts by providing guidance to the agencies of Government most directly involved in programs of this type in developing specific measures and operational criteria for determining when and how these should be effected. Those Federal agencies which deal most directly with the public should be prepared to develop the administrative and technical features of specific alternative measures which lie within their statutory responsibilities. For tasks which the agencies cannot undertake individually, the Council will assist in the development of coordinated plans.

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GUIDANCE FOR ASSESSMENT OF RADIOIODINE IN THE ENVIRONMENT FROM FALLOUT

	Annual Radioiodine* Intake (I-131)	Average Thyroid Dose Equivalent (Infant)	Risk Assessment	Indicated Action
(a)	36,500 μμc	0 - 0.5 Rem	Acceptable. Comparable with natural background	No protective action indicated. Surveillance and exposure evaluation maintained.
(B)	36,500 μμc to 365,000 μμc	0.5 - 5 Rem	Acceptable, with slightly increased risk. Health risk from radiation exposure is less than or comparable to overall effects associated with protective action.	Increased exposure evaluation. Technical advice and assistance provided by Federal agencies. Generally no protective action indicated.
(C)	Above 365,000 μμc	Above 5 Rems	Health risk increases in proportion to the magnitude of the exposure and the number of people exposed.	Appropriate protective actions. Feasible and available means of reducing exposure at State and local level indicated. Technical assistance and advice by Federal agencies.

* - Cumulative level over any period of 12 consecutive months.
- μμc --- micromicrocuries (unit of measurement of radioactivity)

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ENCLOSURE III

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
WASHINGTON

January 4, 1963

MEMORANDUM FOR THE CHAIRMAN, FEDERAL RADIATION COUNCIL

The Department of Health, Education, and Welfare has reviewed the Working Group draft dated November 8, 1962, entitled "Radiation Protection Guidance for Federal Agencies". It is believed that this draft, with the editorial changes reflected in our attachment dated December 21, 1962, would be useful if issued as a public release. An early release would seem to be appropriate since the United States is not undertaking any major weapons testing programs, at the present time, and the Council is committed to expand upon its public statement of September 10, 1962.

Our Working Group representatives have reported that since the issuance of the draft of November 8, the staff comments of several agencies questioned the desirability of giving specific numbers in a tabular form. However, I would like to emphasize that the Department of Health, Education, and Welfare has statutory responsibility to protect the public health. In addition, it must be remembered that, under law, the Department is required to advise and assist the State agencies in the discharge of their legal responsibilities for protecting the public health. These Federal responsibilities cannot be exercised without the establishment of guides. If guides based on definitive scientific data cannot be developed, the guidance must be established on the basis of the best judgment available.

It is believed that some type of action at an early date is essential from the standpoint of this Department, since the only numbers which can be discussed publicly are those in the early Federal Radiation Council reports, which the Council has said are not directly applicable to fallout.

/s/ Boisfeuillet Jones
Boisfeuillet Jones
Special Assistant to the Secretary
(Health and Medical Affairs)

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ENCLOSURE IV

THE DEPUTY SECRETARY OF DEFENSE
WASHINGTON 25, D. C.

November 29, 1962

MEMORANDUM FOR The Chairman
Federal Radiation Council

SUBJECT: Draft Statement on I 131

In our view, a sound decision on a new I 131 policy statement cannot be made until we have heard the views of whoever is to be the new Executive Secretary of the Council. That man will have the principal responsibility for explaining FRC policy to the Congress, the press, and the public. Clearly, his views should be considered before any decision is made.

The Department of Defense, therefore, takes no position on the proposed draft at this time, but once again restates the urgency of selecting the new Executive Secretary.

/s/ Roswell Gilpatric

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ENCLOSURE V

DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D. C.

November 28, 1962

Mr. James G. Terrill, Jr.
Chairman, Working Group
Federal Radiation Council
Washington 25, D. C.

Dear Mr. Terrill:

In response to the request contained in your memorandum of November 9 to the members of the Federal Radiation Council, there is attached a statement of views from the standpoint of the Department of Agriculture concerning the draft "Radiation Protection Guidance for Federal Agencies - Council Policy Concerning Radioactive Iodine in Fallout".

It is noted from your memorandum that the current draft is intended only to cover "the interim need" for amplification of the position already taken by the Council concerning radioactive iodine from fallout. You indicated that a more comprehensive report on several aspects of the fallout problem would be prepared by the Working Group at a later date. It is recognized that the decision to approach the Working Group's assignment in two stages was influenced by the complexities inherent in the development of the more comprehensive statement and the feeling that an earlier report, even though brief, would be necessary.

Information available to this Department since the September 10 statement adopted by the Council does not show an immediate need for an interim statement. The more complete statement could be used by Federal and State agencies, as well as by representatives of industry and the general public, in support of the position taken by the Council on September 10.

If other members of the Council express similar views, it is suggested that the Working Group proceed as rapidly as possible with the formulation of the comprehensive report indicated in your memorandum, in lieu of further work on the interim statement.

Sincerely yours,

/s/ Orville L. Freeman

ORVILLE L. FREEMAN
Secretary

Attachment

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ATTACHMENT TO ENCLOSURE V

Department of Agriculture Comments Concerning Working Group Draft No. 8 on "Radiation Protection Guidance for Federal Agencies - Council Policy Concerning Radioactive Iodine in Fallout"

The draft is readily understandable and should be effective to remove some of the remaining misconceptions about the guides that were developed primarily for industrial usage. It would be helpful in further clarifying this point in the current document, as well as for future use, if a term such as "Industrial Radiation Protection Guides" could be used to designate the 1961 document.

We understand that the Department of Labor and the Atomic Energy Commission recommend deletion of all but the first sentence of the first paragraph on page 4. We have no objection to this and would agree that the deletion would avoid some misunderstandings.

We have difficulty in reconciling the most recent actions of the Council with the proposed new table of guidance in regard to iodine 131. The Council has stated and the current draft reiterates the statement that "radiation dose many times higher than the [Industrial] Radiation Protection Guides for the thyroid would be necessary to produce a detectable increase in adverse health effects". However, 365,000 micromicrocuries appears as one of the dose levels for iodine 131 in the guide for industrial use and appears again in the proposed new guidance as the base figure above which actions would be taken. A point merely "above" the old guide is certainly not "many times higher" as indicated in the Council statement.

The proposed new guidance does not suggest Federal protective action, but does make it quite clear that States and localities would be expected to take appropriate protective actions, with only technical assistance and advice from Federal agencies. This seems

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unrealistic and impossible of accomplishment concerning a subject on which there is general agreement that the Federal government must take effective leadership.

It is appreciated that a radiation dose above 365,000 micromicrocuries is not likely to be attained over any large area of the country (short of war), but it is understood that such levels might be attained in some few localities. We understand also that such levels would not form a basis for seizure or other action by the Food and Drug Administration against products containing iodine 131. Since the figure (365,000 micromicrocuries) is far below any which might be contemplated by the Council's previous statement, the selection of this figure must be based on something other than considerations of hazard to health.

In view of the foregoing, it may be appropriate to forego any effort at this time to set new guidance figures in relation to radioactive iodine from fallout. In lieu of this, the last part of draft No. 8 beginning with the second paragraph on page 4 might be revised along the following lines:

> "The Federal Radiation Council therefore finds it unnecessary and impractical to establish specific dose figures for annual intake of radioactive iodine. The Council does recommend continuing careful surveillance and exposure evaluation throughout the country and that State and local officials and the general public be kept informed of the findings.
>
> "The Federal Radiation Council also recommends that all Federal agencies having responsibilities for the effects of fallout on the human population and on the food and feed supply participate in programs of research to increase the capability to evaluate the effects of

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[redacted]

fallout and to institute countermeasures if such action should become necessary sometime in the future.

"The Federal Radiation Council will from time to time convene special panels of the Nation's most expert scientists in this field in order that the Council and the general public may have the benefit of the latest research findings and scientific evaluation of the probable effects of radioactive iodine from fallout. If at any time in the future unforeseen increases in radioactive iodine from fallout should make it necessary to institute some form of countermeasure activity the Council will at that time promptly inform State and local officials and the general public and furnish the latest information in scientific evaluation and such other assistance as may be appropriate to the circumstances.

"Meanwhile, it is the considered opinion of the Federal Radiation Council that countermeasures against radioactive iodine from fallout are neither feasible nor necessary."

[redacted]

[redacted]

ENCLOSURE VI

U. S. DEPARTMENT OF LABOR
OFFICE OF THE SECRETARY
WASHINGTON

December 21, 1962

MEMORANDUM

To : Chairman, Federal Radiation Council

From : John C. Donovan
Special Assistant to the Secretary

Subject: Suggested Criticism on Radiation Protection Guidance for Federal Agencies (WG/CR/8)

At the request of the Chairman of the Working Group, the Department of Labor has informally reviewed the draft document WG/CR/8. Before the submission of this document to the members of the Council for formal approval, the Department believes that the following suggestions be considered.

Paragraph 1 on Page 4 should be deleted or rewritten. This paragraph implies that the industrial RPG's can be used for application to fallout control. It further implies that the RPG's can be used to control the effects of our own weapons testing but not the effects of testing carried on by other nations.

The Department of Labor is not convinced that this document should be published as an FRC publication. Furthermore, if unilateral actions are taken under the proposed guidance by individual agencies, prior knowledge of such actions should be given the Council.

[redacted]

MH-S-3

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : W. B. McCool, Secretary

DATE: JAN 11 1963

FROM : Bertram H. Schur
Associate General Counsel

SUBJECT: U. S. DEPARTMENT OF LABOR PROPOSED RADIATION SAFETY AND HEALTH STANDARDS

Please process as an action paper the attached draft which has the concurrence of the appropriate divisions. Mr. H. L. Price, Director of Regulation, has requested that this paper be expedited.

Attachment:
Draft paper

AEC 604/72

1-11-63

CLASSIFIED DOCUMENT CROSS-REFERENCE SHEET

DATE: 1/11/63

TO: Chairman Seaborg, Haworth, Palfrey, Ramey
Wilson thru General Manager

FROM: Nathan H. Woodruff

THIS CLASSIFIED DOCUMENT HAS BEEN REMOVED FROM THE FILES AND PLACED IN A CONSOLIDATED CLASSIFIED FOLDER OF THE SAME TITLE.

January 9, 1963

Dear Mr. Celebrezze:

Thank you for your memorandum of January 4 enclosing a draft of the Federal Radiation Council's Annual Report to the President. The Atomic Energy Commission has no suggestions for changes or additions to the report.

Sincerely yours,

Leland J. Haworth
Commissioner

Honorable Anthony J. Celebrezze
Chairman
Federal Radiation Council
Executive Office Building

cc: Commissioners
General Manager
Secretary

January 7, 1963

MEMORANDUM FOR COMMISSIONER WILSON

THROUGH GENERAL MANAGER SIGNED, A. R. LUEDECKE JAN 11 1963

SUBJECT: ADDITIONAL INFORMATION ON STRONTIUM-90

The following material supplements the estimates I gave you on December 20 in response to your telephone inquiry about strontium-90. Information on the first three items has been provided by Dr. W. F. Reitemeier, a Soil Scientist in the Environmental Sciences Branch, Division of Biology and Medicine.

1. A tendency has been noted in some Southeastern soils for a portion of the strontium-90 to become chemically fixed in such a way as to be not as available for plant uptake as when it is in a form readily exchangeable by other cations. Experiments are underway to determine the extent of fixation in such soils, and the time scale over which it occurs. At the moment, however, fixation is not considered to be a factor which would greatly mitigate the incorporation of deposited strontium-90 in the food chain.

2. Cultivation of land, especially repeated tillage, has the effect of mixing deposited strontium-90 throughout the plow depth of the soil. So far, there is no evidence that it exerts a major influence on the movement of this nuclide below the plow depth.

3. Liming of acid soils in excess of that required for optimal agricultural productivity is not very effective as a countermeasure for strontium-90, and has not been recommended. Only those agricultural lands which were originally highly acidic or have become so, and therefore are in serious need of lime, would have the strontium-90 content of crops or milk reduced by liming by a factor of two or greater. Dr. Reitemeier encloses several reports dealing with these subjects.

1-7-63

4. An estimate of the relative significance of newly deposited vs. soil-accumulated strontium-90 on the levels of this nuclide in U. S. milk and food supplies is given on pages 24-27 of TID-13945 (attached). It is there concluded that during 1958, between 50 and 65 percent of the strontium-90 in U. S. milk supplies resulted from strontium-90 accumulated in the soil. The soil contribution is estimated to have fallen as low as 40% only for the months of April, May, and June 1959. Milk levels were at their peak value during these months because of the high spring fallout that year.

Harold Knapp
Fallout Studies Branch
Division of Biology and Medicine

Attachments
TID-13945
Farmers' Bulletin No. 2126
Farmers' Bulletin No. 2107
Reprint Transactions Vol. III
(7th Intern. Congress of SS)
Reprint, Journal of AVMA, Vol. 136
Paper, Remedial Measures of Environmental Radioactive Contamination
Paper, Plant Uptake of Radionuclides

RECEIVED [illegible]
cc: GM (2) MAC
Secretariat
[illegible]

GM
1- -63

FSB:DBM	FSB:DBM	DMA	ADA	Director:DBM	AGMRAD
HAKnapp:lvb 1-7-63	JZHolland 1-7-63	SAllough 1-7-63	Stanwood 1- -63	CLDunham 1- -63	1- -63

Mc S-3

January 7, 1963

MEMORANDUM FOR COMMISSIONER WILSON

THROUGH GENERAL MANAGER SIGNED, A. R. LUEDECKE JAN 11 1963

SUBJECT: ADDITIONAL INFORMATION ON STRONTIUM-90

The following material supplements the estimates I gave you on December 28 in response to your telephone inquiry about strontium-90. Information on the first three items has been provided by Dr. B. F. Heidemann, a Soil Scientist in the Environmental Sciences Branch, Division of Biology and Medicine.

1. A tendency has been noted in some Southeastern soils for a portion of the strontium-90 to become chemically fixed in such a way as to be not as available for plant uptake as when it is in a form readily exchangeable by other cations. Experiments are underway to determine the extent of fixation in such soils, and the time scale over which it occurs. At the moment, however, fixation is not considered to be a factor which would greatly mitigate the incorporation of deposited strontium-90 in the food chain.

2. Cultivation of land, especially repeated tillage, has the effect of mixing deposited strontium-90 throughout the plow depth of the soil. So far, there is no evidence that it exerts a major influence on the movement of this nuclide below the plow depth.

3. Liming of acid soils in excess of that required for optimal agricultural productivity is not very effective as a countermeasure for strontium-90, and has not been recommended. Only those agricultural lands which were originally highly acidic or have become so, and therefore are in serious need of lime, would have the strontium-90 content of crops or milk reduced by liming by a factor of two or greater. Dr. Heidemann encloses several reports dealing with these subjects.

E7-11

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Harold Knapp
Fallout Studies Branch
Division of Biology and Medicine

Attachments
TID-13945
Farmers' Bulletin No. 2124
Farmers' Bulletin No. 2107
Reprint Transactions Vol. III
(7th Interm. Congress of SS)
Reprint, Journal of AVMA, Vol. 136
Paper, Remedial Measures of Environmental Radioactive Contamination
Paper, Plant Uptake of Radionuclides

cc: GM (2)
Secretariat

GM
1- -63

FOB:DBM	FAB:DBM	DMA	ADA	Director:DBM	AGMEAD
HAKNAPP:lvb	JZHolland	GAlough	Stanwood	CLEMENAM	
1-7-63	1-7-63	1-7-63	1- -63	1- -63	1- -63

FEDERAL RADIATION COUNCIL
EXECUTIVE OFFICE BUILDING
WASHINGTON 25, D.C.

JAN 4 1963

MEMORANDUM FOR: Members, Federal Radiation Council

SUBJECT: Annual Council Report to the President

As you know, one of the responsibilities of the Council is to advise the President of activities within the Federal Government concerning radiation protection criteria established by Federal agencies within the guidance promulgated by the Council.

Accordingly, I am forwarding for your information a brief resume' of agency reports for 1962 which, as noted by the Working Group in its review of this statement, contains no controversial views. If you should wish to acknowledge or comment on this draft, I would appreciate your so advising the Secretariat so that I may forward this report, in final form, to the President by the fifteenth of January.

Anthony J. Celebrezze

Anthony J. Celebrezze
Chairman

Attachment

SECY

197-6

e+ Gm/A

DRAFT FOR APPROVAL

FEDERAL RADIATION COUNCIL
EXECUTIVE OFFICE BUILDING
WASHINGTON 25, D.C.

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Radiation Protection Activities of Federal Agencies under Radiation Protection Guidance for Federal Agencies promulgated by the President

In line with its statutory responsibility to advise the President on radiation matters directly and indirectly affecting health, including guidance to Federal agencies on radiation standards, the Federal Radiation Council in 1960 established the following system of reporting by Federal agencies on their radiation protection activities:

1. A regular annual report by each agency on August 1 as to any operating criteria or regulations revised, adopted, or promulgated during the previous year under the Radiation Protection Guidance for Federal Agencies promulgated by the President.

2. Prompt notification of the Council of the adoption or promulgation of any new or revised operating criteria or regulations in areas covered by approved Radiation Protection Guides. Cases involving levels in excess of such guides are to be noted.

The following Federal agencies having radiation protection responsibilities which might fall under the Radiation Protection Guidance for Federal Agencies promulgated by the President submitted an annual report for the period ending August 1, 1962.

Atomic Energy Commission

Department of Agriculture

Department of Commerce

Department of Defense

Federal Aviation Agency

Department of Health, Education, and Welfare

Department of the Interior

Interstate Commerce Commission

Department of Justice

Department of Labor

National Aeronautics and Space Administration

Post Office Department

Department of the Treasury

Veterans Administration

Replies indicate that the Federal agencies are conducting their radiation protection activities in accordance with the Presidential guidance, and that as of the date of their reports no deviations from the guides were in effect. In connection with the weapons tests held this year at the Nevada Test Site, the Atomic Energy Commission has continued to use offsite population exposure criteria adopted by the Commission in 1955.

Recommendation 7 of Radiation Protection Guidance for Federal Agencies promulgated by the President on May 13, 1960 states:

> "The guides may be exceeded only after the Federal agency having jurisdiction over the matter has carefully considered the reason for doing so in light of the recommendations in this paper."

Consistent with the recommendation, the Federal Radiation Council will continue to follow the practices of the Federal agencies as set forth in these reports and will bring to your attention such matters as seem appropriate.

Anthony J. Celebrezze
Chairman

MH&S 3-Radiation

12/24/52

Dear Mr. Holifield:

In reply to your letter of November 26th and the questions concerning the status and availability of countermeasures against radiation or contamination with radioisotopes, there is included a brief summary of Atomic Energy Commission activities in the following paragraphs. Attached to this letter is somewhat more detailed material which it is hoped will be of value to your Committee.

Atomic Energy Commission activities related to countermeasures against radiation or environmental contamination have been based on the Commission's statutory obligation to manage the program of nuclear technology in such a way that the public health and safety is adequately protected. Under this obligation, intensive programs have been conducted in four major areas:

1. The Commission has conducted an intensive program to determine the biological effects of radiation in all possible combinations that could reasonably be anticipated to result from the program of nuclear technology.

2. An intensive program to describe the physical and chemical characteristics of radiation sources including the mechanisms of radioisotope movement in the environment, on the one hand, and the mechanisms of the absorption and attenuation of radiation by matter on the other.

3. Organizations, equipment and techniques for rapidly evaluating the degree of environment contamination resulting from an unplanned nuclear incident and techniques for undertaking decontamination actions under a wide variety of conditions.

4. A program of providing the information necessary to those concerned with the development of standards for radiation protection. These activities have been reflected for years in the many publications of the National Committee on Radiation Protection including, NCRP Report No. 29 entitled, "Exposure to Radiation in an Emergency," and more recently in the reports of the F.A.C.

Copies filed
MH&S-3 Fallout
MH&S-3 Contamination
AEC-7 GCRE

12-24-52

Since the Commission's safety criteria for the management of the atomic energy program are based on the assumption of negligible risk under continuous lifetime exposure conditions, the need for countermeasures is most logically focused on unusual circumstances which are capable of causing short-term injuries. Thus, techniques for mitigating the biological influence of exposure are most applicable when a small number of people have been exposed to conditions capable of causing acute radiation injury or death. Most of these are not generally applicable to mass application or to combatting chronic exposure effects. Similarly, techniques of agriculture management would be most appropriate for coping with the aftermath of a nuclear war or coping, within a limited area, with the consequences of a major nuclear incident such as at Hanford and at Windscale.

Although not considered as "radiological countermeasures" as used by the Joint Committee on Atomic Energy in its letter, actions have been taken by the AEC as a normal part of its safety management procedures. These have included certain simple actions such as having people remain indoors with the windows closed as at St. George, Utah in 1953 during passage of a radioactive cloud.

Monitoring and surveillance at and near AEC sites:

As a necessary part of any procedure designed to initiate the application of countermeasures to any type of relatively extensive radioactive contamination some monitoring and survey work is necessary. Each major AEC installation has a comprehensive system of monitoring and surveillance in and around its site. These programs are directed primarily toward problems that might arise from the specific activities at each site but are of such a nature that they can and do assist in monitoring fallout from nuclear weapons tests. They also have the capabilities of assisting in monitoring in the event of a nuclear war or a major nuclear accident.

Enclosure 1 summarizes and illustrates the type of monitoring activities conducted at AEC sites.

Some AEC sites maintain a capability consisting of emergency standby equipment which can be placed in an airplane for use in aerial survey. In addition, there is one complete operational survey system including an airplane and operating personnel and equipment which can make rapid and accurate aerial surveys of places or regions of suspected contamination. Such a survey in many circumstances would be a useful prelude to the application of available countermeasures designed to decontaminate

areas on a relatively large scale (nuclear accident). It would be similarly useful to locate areas of minimum contamination under conditions of nuclear war. (Enclosure II).

Radiological Assistance program:

The Atomic Energy Commission participates in and is a key member in an interagency plan which trains and equips teams that are available for incidents involving radioactive material. These teams are able to make a rapid assessment of the extent of a contaminated area and to apply certain decontamination procedures. While specifically set up for local emergencies these teams would be useful under most conceivable circumstances involving relatively large releases of radioactive substances. (Enclosure III).

In conjunction with the DOE there is maintained an emergency radiation team and a depot of medical supplies for use in radiation emergencies. (Enclosure IV).

Agricultural countermeasure procedures which have been fully developed, and which can be put to immediate use (work performed in part at the U. S. Department of Agriculture and funded by AEC):

(1) Decontamination of agricultural land surfaces by the harvesting and disposal of contaminated plants, and by the raking off of contaminated surface mulches and crop residues;
(2) Decontamination of agricultural land surfaces by the mechanical scraping off of a surface layer of the soil from the land;
(3) Decontamination of bare soil surfaces by the spray application of an asphalt emulsion followed by the removal of the hardened asphalt-soil layer.

All of the environmental countermeasures indicated in the preceding sections would be more or less appropriate for nuclear war survival and recovery depending on local circumstances and especially for nuclear accidents involving large local releases of radionuclides to the environment. Others which represent normally recommended practices, such as the fertilization and liming of food crop soils to optimal productivity levels, would generally have some slight beneficial effect on

exposures from fallout from nuclear weapons testing, especially to reduce strontium uptake. In addition, efforts to select or develop (employing seed irradiation) specific genetic lines of agriculturally important plants that will preferentially take up calcium so that the strontium calcium ratio in the plants is lower than that in the soil, are in progress.

The research program related to agricultural countermeasures entails a yearly cost of about $268,000.

Countermeasures applicable to humans.

The procedures which are immediately applicable to aid recovery of humans exposed to excessive radiation or to excessive amounts of certain radioisotopes taken internally are detailed more fully in the Enclosure V.

The majority of procedures applicable to humans are either under development or are the subjects of intensive research efforts. This research is carried at a level of expenditure which reached $6,559,100 during FY 1962. The effort during FY 1963 is expected to be about 3-5% greater.

All of the countermeasures applicable to humans still require considerable research and development before they can be utilized on a mass basis. In specific instances, where a finite number of individuals are involved, certain of the measures can be applied with some degree of feasibility and success.

Finally, you asked "for what conditions would countermeasures listed under items 1 and 2 above be both applicable and needed" this is indeed a difficult question since the responses given depend upon variables, many of which may be unique to a particular situation. In fact, it would be a disservice to establish hard and fast rules governing possible future actions.

In regard to nuclear warfare or a nuclear accident involving a high level release of radioactivity, broad guidelines can be given to assist in what probably would account to "command decisions" in the event of an emergency, i.e., possible countermeasures to reduce radiation exposure must be weighed against their potential health risks to the population and against other hazards encountered with the emergency. Such an approach has been taken by the National Committee on Radiation Protection and Measurements in their report "Exposure to Radiation in an Emergency." The report does not purport to indicate when or what

countermeasures should be taken for the reasons stated above, i.e., these actions must be evaluated on the basis of the emergency situation.

In regard to the applicability of countermeasures for fallout from weapons testing, the Commission's view is that countermeasures are applicable primarily when unusual circumstances are created which could lead to short term radiation injuries. The Commission's policy of program management, including weapon tests, is designed so that conditions requiring after-the-fact countermeasures are not likely to be created, particularly with respect to possible long-term injury. In fact, as pointed out by the Federal Radiation Council, exposure levels many times above fallout levels to date in the United States would be needed to justify such countermeasures. On the other hand, if fallout levels of ¥131, for example, were found to be comparable to those observed following the Windscale reactor accident, countermeasures might be appropriate. The best case for the situation would have to be selected at the time.

If I can be of further assistance to you concerning this matter, please do not hesitate to let me know.

Sincerely yours,

151 gTS

Chairman

Honorable Chet Holifield
Chairman, Joint Committee on
Atomic Energy
Congress of the United States

cc: Chairman (2)
Congressional Relations (3)
General Manager (2)
AGMED (1)
DMA (1)
AIMS (1)

Enclosures:
1. Monitoring Activities
2. Aerial Radiological Measurement System
3. Radiological Assistance Capability
4. Emergency Radiation Team
5. Countermeasures Procedures Applicable to Personnel

DMA	ADA	AIMS	OE	RA
12/ /62	12/ /62	12/ /62	12/ /62	12/ /62

RR:HR	CUSO. REL.	AGMED	GOM	DGM	GM
12/ /62	12/ /62	12/ /62	12/ /62	12/ /62	12/ /62

[redacted]

[redacted]

The Atomic Energy Commission fallout information network was reactivated in September 1961, to provide a means of prompt determination and reporting of increased levels of atmospheric radioactivity in the area of AEC facilities due to fallout from nuclear weapons testing. There has not been a full test to attempt to establish specific types of continuing programs or standardization of procedures. However, arrangements have been made to utilize radiological emergency assistance teams to investigate alleged or suspected fallout "hot spots" anywhere in the country. Normally, all stations perform measurements of concentrations of radioactivity in air (as an "alert" mechanism) and external gamma measurements. Many stations perform radioactivity measurements of rainwater and a variety of other environmental samples. Although these are first stations the environmental monitoring data is collected from surrounding areas including the immediate site. Within the geographical limits in which the sampling could be carried out, information could be obtained that would be useful in connection with radiological hazard considerations following a nuclear incident or undesirable exposures to fallout from nuclear weapons testing. Such information could also contribute to the success of countermeasures applicable to protection and survival or recovery although most of the environmental contamination information in a post war situation will probably come from other agencies such as the Department of Health, Education and Welfare and state public health departments.

The data collected is submitted to the Nuclear Explosives Environmental Safety Branch (NEES), Division of Operational Safety, Headquarters, on a monthly routine basis. In the event that any information indicates a possible public exposure, this information is transmitted by telephone or by TWX to NEES.

RADIOLOGICAL MONITORING ASSOCIATED WITH AEC PROGRAMS

The following table presents the locations and types of radiation measurements now being made by AEC and AEC contractor activities. The frequency of collecting and reporting this information has been determined from files of data actually received from each activity within the past several months.

Reporting Activity	External Gamma	Air Sampling	Milk Sampling	Gum Papers	Rainfall and Settled Dust
AIKEN, SOUTH CAROLINA Savannah River Oper. Off [1]		X	X		
ALBUQUERQUE, NEW MEXICO Sandia Corporation [2]		X			
ARGONNE, ILLINOIS Argonne National Lab [3]		X			
BERKELEY, CALIFORNIA Lawrence Radiation Lab [4]		X			
IDAHO FALLS, IDAHO Idaho Operations Office [5]	X	X			
LOS ANGELES, CALIFORNIA University of California [6]	X	X		X	
NEW YORK, NEW YORK Health & Safety Lab of AEC [7]		X			
OAK RIDGE, TENNESSEE Oak Ridge Operations Off [8]		X			
RICHLAND, WASHINGTON Hanford Operations Office	X [9]	X [10]			
ROCHESTER, NEW YORK University of Rochester [11]	X	X			
ST. PETERSBURG, FLORIDA Pinellas Peninsula Plant [12]	X	X			
UPTON, NEW YORK Brookhaven National Lab	X [13]	X [14]	X [15]		X [16]

1/ Milk samples are collected from each of six locations on a weekly basis. Some samples come from dairies, some from individual farms. Also, gross beta activity of particles in air is measured on a daily basis.

2/ Air samplers run continuously. Filters are changed every 24 hours from Monday through Thursday, with an 8-hour run on Friday and about 64 hours over weekends.

3/ Filters are changed every 24 hours. Gross beta activity of these samples is reported monthly.

4/ Air sampler runs continuously. Filters are changed every 24 hours. Airborne beta-gamma activity is reported monthly.

5/ Air samplers run continuously. Filters are changed every 24 hours. External gamma radiation is recorded daily. Beta activity of airborne particles and external gamma radiation is reported monthly.

6/ Filters are changed every 24 hours. Gum papers are replaced at two stations every 24 hours. External gamma radiation is recorded at two stations daily. These data are reported monthly.

7/ Air sampler runs continuously. Filters are changed every 24 hours. Beta activity of airborne particles is reported monthly.

8/ Concentrations of activity in air are determined on a daily basis. These data are reported weekly.

9/ Measurements of external gamma radiation are obtained weekly for the Hanford site and for Richland, Washington. These data are reported monthly.

10/ Weekly samples of gross beta radioactivity on air filters are obtained from stations at the following locations:

a. Boise, Idaho
b. Lewiston, Idaho
c. Walla Walla, Washington
d. Spokane, Washington
e. Yakima, Washington
f. Seattle, Washington
g. Meachum, Oregon
h. Klamath Falls, Oregon
i. Great Falls, Montana

Daily samples of gross beta radioactivity on air filters are obtained from the Hanford site and from Richland. These data, plus the weekly data from the above stations, are reported monthly.

11/ Daily measurements of external gamma radiation and gross beta activity of particles in air are made.

12/ Air sampler runs continuously. Filters are changed every 24 hours during the week but are not changed during weekends. Daily measurements of external gamma also are made. These data are reported on a monthly basis.

13/ External gamma radiation is reported monthly in terms of mr/week.

14/ Daily values of air particulate activity are reported monthly.

15/ Routine scanning of milk samples from six Suffolk County farms for iodine-131 has been started.

16/ Activity in weekly collections of rainfall and settled dust is being determined, and the data reported on a monthly basis.

The following represents only a brief summary of information that could be collected in the short time available. Whereas, the information below indicates quarterly reporting, we will probably go to semiannual reporting since it fulfills our needs and lessens the excessive requirement placed on AEC installations for preparing quarterly reports.

1. Bettis Atomic Power Laboratory, Pittsburg, Pennsylvania:

A quarterly report on levels of radioactivity in the vicinity of this installation is submitted to AEC. It contains levels of activity released in the form of wastes, beta-gamma background levels near the laboratory, results of monthly fallout collections from eight stations, and results of continuous soil sampling.

2. Shippingport Atomic Power Station, Shippingport, Pennsylvania:

A quarterly report on levels of radioactivity in the vicinity of this installation contains levels of activity released in the form of wastes, weekly samples of airborne particulates, external beta-gamma measurements for four locations, fallout collected at four stations, airborne particulate radioactivity and concentrations of alpha and beta emitters in the Ohio River.

3. Argonne National Laboratory, Argonne, Illinois:

A quarterly report from this laboratory contains data on radioactivity found in Sawmill Creek and in the Des Plaines River and results of a grass sampling program.

4. Rocky Flats Plant, Denver, Colorado:

A quarterly report from this plant contains data on radioactivity found through air sampling at Coal Creek Canyon, Marshall, Boulder, Lafayette, Bromfield, Wagner School, Golden, Denver and Westminster, and in water samples taken from four reservoirs near the plant. The report also contains data on vegetation samples.

5. Project Chariot:

From this project come results of determinations of gross beta activity in Alaskan air samples. Sampling points are Cape Thompson, Kivalina, Kotzebne and Point Hope.

6. Hanford Operations Office, Richland, Washington:

A quarterly report from Hanford includes the following:

a. Occurrences of iodine-131 in cattle thyroids.

b. Release of iodine-131 to the atmosphere versus time.

c. Phosphorus-32 in Columbia River Whitefish.

d. Concentration of phosphorus-32, zinc-65, arsenic-76, neptunium-239 and chromium-51 in Columbia River water versus time.

e. Predicted 12 months dose for GI tract from drinking water at Pasco and Kennewick.

f. Results of regular analysis of oysters from Willapa Bay for zinc-65 and other radionuclides.

g. Regular analysis of milk in the Hanford area.

7. Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio:

A quarterly report from this plant contains data from air sampling at fifteen locations near the plant and from water samples collected monthly at fourteen locations.

8. Savannah River Plant, Aiken, South Carolina:

A quarterly report from this plant contains the results of a continuous monitoring program to determine the concentrations of radioactivity in a 1200 square mile area outside the plant perimeter. Rainwater samples are collected weekly at fifteen stations. Monthly samples of vegetation and water (collected from fourteen surrounding towns, both deep well and surface streams) are collected and analyzed. Fresh eggs and peaches also are analyzed.

9. Brookhaven National Laboratory, Upton, New York:

Quarterly reports contain measurements of released radioactive liquid wastes and data on gamma levels at site boundaries due to coolant air effluent.

10. Mound Laboratory, Miamisburg, Ohio:

Quarterly reports contain results of continuous air monitoring for tritium and radioactive particulates in air. Water samples are collected weekly from a drainage ditch and from five locations along the Great Miami River.

11. National Reactor Testing Station, Idaho Falls, Idaho:

Quarterly reports contain data on radioactivity in off-site underground water, off-site air samples, rabbit bones and milk.

12. Oak Ridge Operations Office, Oak Ridge, Tennessee:

Quarterly reports contain data on radionuclides found in water obtained from a number of locations along the Clinch River and on external gamma measurements at a number of locations in the Oak Ridge area.

13. Paducah Plant, Paducah, Kentucky:

Quarterly reports contain data on radioactivity in air at four on-site and four off-site stations and in water at two locations in Big Bayon Creek and four locations on the Ohio River.

14. Atomics International, Canoga Park, California:

Quarterly reports contain data on daily air sampling, monthly water sampling and monthly soil and vegetation sampling.

15. Feed Materials Production Center, Fernald, Ohio:

Quarterly reports contain results of air sampling, both on and off-site, and of water sampling in the Great Miami River.

16. Knolls Atomic Power Laboratory, Schenectady, New York:

Quarterly reports contain measurements of liquid radioactive wastes, airborne radioactivity at several locations, gross beta activity in the Mohawk River and in Glowegee Creek, radioactivity in rainfall and in soil samples.

17. SIC Prototype Reactor Facility, Windsor, Connecticut:

Quarterly reports contain measurements of gross beta-gamma concentrations in exhaust stack effluents, gross beta-gamma concentrations in air on-site downwind of release points, gross beta concentrations in fallout, gross beta-gamma radioactivity released to the Farmington River, gross radioactivity of water samples from the Farmington River and gross radioactivity of mud samples from the Farmington River.

ENCLOSURE II

AERIAL RADIOLOGICAL MEASUREMENT SYSTEM

An Aerial Radiological Measurement System is operational and available for immediate use. The self-contained and associated navigational and space positioning instrumentation is mounted on a Beech Twin Bonanza Model 50 airplane. The system is extremely versatile and can determine ground radioactivity over a large area rapidly and economically. The range covered by the system is from natural background to hundreds of r/hr. The radiation background around major AEC sites has been mapped by the aerial survey program, thus providing a baseline for determining the extent of contamination of the environment either by continuous release or by an accidental release of radioactivity. Research studies at an annual level of about $100,000 are in progress to improve our knowledge of aerial survey techniques. Methods of measuring aerial and ground spectra are being studied in an effort to perfect a means of using aerial surveys to provide specific isotopic content of ground contamination.

The mobility of the system permits the equipment to be flown directly to an area for use in gathering specific data regarding radiation levels on the ground, together with pinpoint information about the location of hot spots. The capability is used for tracking and measuring the radioactive debris from nuclear detonations and for rapidly determining the area affected by an accidental release of radioactivity.

ANNEX III

RADIOLOGICAL ASSISTANCE CAPABILITY

Under the provisions of the Commission's Radiological Assistance Program a nation-wide radiological emergency assistance capability is operational. Teams of trained specialists can be dispatched from 26 AEC or AEC contractor installations to respond to requests made to the AEC for radiological emergency assistance. If needed, the initial emergency team response could be supported by utilizing all of the men power and material resources that could be spared from the AEC's operations to cope with the emergency.

The emergency capabilities include radiation monitoring of personnel, the environment and materials; emergency decontamination necessary to protect health and safety; medical advice on the handling and treatment of people injured or exposed to radiation or both; emergency laboratory analytical services needed to provide information on personnel radiation exposure or radiation hazards; and resources such as transportation, special equipment and emergency communications. This radiological emergency capability is most applicable to accidents resulting from peaceful atomic energy activities but could be used in connection with the Commission's post-attack role in the National Plan for Civil Defense and Defense Mobilization to the extent that the capabilities still existed and were not needed at AEC facilities. Through an agreement with the Department of Defense the AEC can receive assistance from the DOD radiological emergency capabilities in nuclear weapon accidents and accidents involving explosive material in other ways. This is a mutual agreement that applies only during peacetime operations.

ENCLOSURE IV

EMERGENCY RADIATION TEAM

An Emergency Radiobiology Team established jointly by the AEC, DOD and DHEW in 1956 is currently being updated. This team is intended to be prepared to handle emergencies resulting in the radiation exposure of a number of individuals such as occurred in March of 1954 when 250 persons in the Marshall Islands were exposed to fallout from weapons testing. Six tons of special equipment is maintained, packaged and ready for rapid shipment from Field Command DASA, Sandia Base, Albuquerque, New Mexico. Although this team and equipment was originally for use outside the United States, it is intended to establish this capability for use within the continental limits of the United States as well as elsewhere. This Emergency Radiobiology Team would not be expected to be of significant value in the post-nuclear war situation but could be of considerable use following a serious radiological accident during peacetime.

ENCLOSURE V

CONTAMINATION PROCEDURES APPLICABLE TO PERSONNEL

Definitions Used

Situation #1 - Nuclear War with all the population affected. Exposures on both internal and external with marked disruption of all transportation, communication, and medical facilities.

Situation #2 - Windscale-like event of less than nationwide scope. Main hazard is not external radiation but ingestion or inhalation of the radioactivity.

Situation #3 - A criticality accident involving a limited area but the hazard is mainly external exposure.

Situation #4 - As for #3 but area even more limited.

Situation #5 - Excessive hot spots from fallout.

ENCLOSURE V (CONTINUED)

ELEVATION	CONSIDERATIONS	QUESTION No.
1 2 3 4 5		
X X X X -	Symptomatic treatment of individuals subjected to external radiation.	
X - X X -	Platelet and bone marrow infusions in cases of severe exposure to ionizing radiation.	
- X - - X	Use of KI, KCNS, K ClO_4 to block thyroid for uptake of radioiodine.	
- X - - X if necessary	Chelating agents for removal and/or prevention of deposition of radionuclides in the body. DTPA, EDTA.	

SITUATION **QUESTION 1b**

1	2	3	4	5	
X	X	X	X	X	Symptomatic treatment
X	X	X	X	X	Bone marrow and other formed blood element transfusions. Includes storage facilities for such elements.
X	X	-	-	X	Use of thyroid blocking agents, and high levels of stable calcium.
X	X	-	-	X if needed	Radioelement elimination by use of chelating agents DTPA, EDTA.
X	X	-	-	-	Use of protective respiratory equipment.

PROGRAMS OF RESEARCH THAT CAN BE RELATED DIRECTLY TO CONTINGENCY PREPAREDNESS

Area of Research		Yearly Expenditure (1962)
Radioelement elimination from the body		$ 434,520
Retention of Sr^{90} in the Body	$132,399	
Retention of Cs^{137} in the Body	37,336	
Thyroid Blocking	48,970	
Radioelement elimination from foods		74,600
Bone Marrow (Including platelet and erythropoietic factors)		1,712,400
Chemical Protectants		244,500
Respiratory Equipment		49,850
Tissue Banks		19,200
Miscellaneous		54,600
	TOTAL	$2,339,100

FORM AEC-204
(6-47)

DATE:

INDEX: MH&S-3-Radiation

[redacted]

TO:

FROM:

SUMMARY: AEC 981/29: EYE BURNS - NUCLEAR TEST IN PACIFIC. Memo to the General Manager from the Director, Division of Operational Safety with re to eye injuries sustained by two enlisted men who viewed a nuclear detonation over Johnston Island.

FILED:

INDEXER: MH&S-16-5-Accidents and Accident Prevention

REMARKS: date of paper: 12-7-62
date of memo: 11-27-62

U. S. ATOMIC ENERGY COMMISSION

CORRESPONDENCE REFERENCE FORM

12-7-62

☆ U. S. GOVERNMENT PRINTING OFFICE—1955—382605

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February 25, 1963

ATOMIC ENERGY COMMISSION

SUMMARY NOTES OF MEETING WITH THE DEPARTMENT OF NAVY OFFICIALS

Tuesday, December 4, 1962, 3:15 p.m., Room 1113-B
D. C. Office

Commissioners	Staff
Glenn T. Seaborg, Chairman	Clifford K. Beck
Leland J. Haworth	James F. Gibson
James T. Ramey	James H. Hill
John G. Palfrey	John C. Hoyle
	Dwight A. Ink
Director of Regulation	Peter A. Lara
	Robert Lowenstein
Harold L. Price	Marvin M. Mann
	James R. Yore
General Counsel	
	Department of Navy Officials
Joseph F. Hennessey	
	Captain R. E. Riera
Secretary	Captain E. E. Conrad
	Commander A. D. Nicholson
W. B. McCool	Commander Paul Crutchfield

Mr. Ink introduced for consideration the topic of Safety Review of Port Operations of Nuclear Powered Naval Vessels. He said preliminary discussions had been conducted with Admiral Griffin who was unable to attend the meeting.

Captain Riera, in response to a question by the Chairman, said Fleet Operations is most interested in finding a way to facilitate the port operations of nuclear powered ships consistent with the maintenance of reasonable safety standards. He indicated his belief that the AEC draft procedures offer a reasonable beginning toward the accomplishment of these objectives. Commander Crutchfield

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said Naval Operations has been interested in the establishment of port entry criteria for some time. He expressed his belief that the proposed procedures seem to be viable, but noted the undue limitations which unreasonably restrictive criteria might impose on operations.

Mr. Ink said the draft letter to Secretary Korth focuses on a port entry plan developed within the Navy for each port. He explained the AEC clearly does not wish to have a repetitive process for each port visit a given ship might make. He said, however, changing conditions having safety significance for a port would have to be considered. He cited as an example how a seasonal change of wind might possibly affect the safety analysis of a specific port. Commissioner Palfrey said there are two streamlining aspects to the proposed safety review procedures: (1) a report would be required only on new or different conditions; and (2) provision would be made for periodic joint study between CNO personnel and the Commission.

Captain Conrad said a considerable amount of background data has been gathered for a number of ports. In this vein, he asked if the AEC could prepare an initial list of ports which at present are suitable for entry. Mr. Ink replied that the general criteria would have to be developed before such a list could be considered and that present procedures would govern in the interim until the new port criteria are developed and implemented. Commissioner Haworth said that past experience would be valuable in the preparation of the general criteria, however.

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Captain Riera said the Office of Naval Operations has a list of ports visited recurrently. San Juan and Holy Loch, while not home ports, are examples of listed ports.

Mr. Price said existing procedures would remain in effect until new port entry criteria can be established. He said the anticipated periodic reviews might be a route for changes in the list of ports.

In reply to a question by Commissioner Ramey, Mr. Beck said, with respect to recurring port operations, a list of ports has been developed in previous reviews and in connection with mutually agreed upon operating plans. He said different ports or plans would require additional arrangements. Mr. Ink reiterated that such a list of ports has no bearing on the proposed procedures at this time since there are many unknowns surrounding the establishment of the general criteria. Mr. Ink recognized that it would be operationally restrictive if criteria were narrowly established and meaningless in terms of safety if defined too broadly. Captain Riera, commenting on the Mediterranean cruise of the USS ENTERPRISE, said procedures at that time required negative reports in addition to reports on conditions of an increasing safety concern. He noted the restrictive nature of these procedures because of the negative report requirement.

In reply to a question by Commissioner Ramey, Commander Crutchfield said the November 25, 1958, Operations Plan 25 specified that a nuclear powered ship could operate only in home yards or ports and enumerated the determinations

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the CNO must make for additional operations. He said following a Fleet Commander's request for nuclear operation clearance, two offices within CNO, one of which is Atomic Energy Operations, must act on the request. Assuming approval by both, coordination is then needed with Admiral Rickover's group. The operations plan specifies that Admiral Rickover inform the Chairman, ACRS, of each proposed visit, receive any comments he might wish to make, and pass these comments, along with his own, to the Chief of Naval Operations. Commander Crutchfield said the CNO, after considering Admiral Rickover's recommendations, makes a decision on the Fleet Commander's request and notifies him by directive.

Commander Crutchfield said a new operations plan collates certain ports recurrently visited which Admiral Rickover has determined no longer require consultation. He said Fleet Commanders notify CNO of those ports entered under the order excluding home ports and yards at the end of each month. Commander Crutchfield said many ports are presently listed in the category, and he noted the new operations order had alleviated operational restraints considerably.

In response to a question by Commissioner Palfrey, Captain Riera indicated that the nuclear powered vessel problem is not entirely analogous to the ammunition ship problem. He said as Commanding Officer of the USS FORRESTAL, he was permitted to enter and dock in any port subject to the conditions that munitions aboard the vessel were not being handled or moved about. He said the ship carried

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thousands of tons of explosives and many nuclear weapons.

In reply to a question by Mr. Price regarding the procedures for ammunition ships, Captain Conrad and Captain Riera said there are criteria governing the handling of ammunition as opposed to criteria governing the handling of the ship, per se. Captain Conrad said once a ship is loaded with munitions, it is treated the same as any other ship. Mr. Price emphasized his understanding that there are definite regulations governing ammunition ships. Captain Riera said the regulations pertain to handling of ammunition rather than specifically to ammunition ships.

Mr. Ink indicated that it would be useful for CNO personnel to explain the kind of port review or analysis that is normally accomplished before a ship enters a port and asked if there might be something comparable to an aircraft flight plan in this regard. Captain Riera, in reply, said there is no plan really comparable to an aircraft flight plan in the operation of a vessel. He said when a port is notified of the expected arrival of a ship, anchorage and a pilot are assigned to her, and logistics assurance is provided. He added that this generally applies to any port irrespective of its being a foreign or domestic port with the exception that a foreign port requires diplomatic clearance.

Commissioner Palfrey, referring to the Commission's draft letter to Secretary Korth, said the AEC would be willing to assist the Department of the Navy in the establishment of criteria governing the port entry of its

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nuclear ships. He noted the importance of establishing specific criteria under which AEC's and Navy's responsibilities would be carried out. Captain Riera said that it is also operationally important to coordinate and consolidate existing instructions. Mr. Price said more is needed than the consolidation of instructions. Referring to the matters of population and population density, Mr. Price said a more specific type of provision setting forth the minimum distances between a ship and inhabited areas is needed. He said such a requirement might reduce the number of piers which could be utilized by a nuclear ship.

In reply to a question by the Chairman, Captain Riera said there is general belief that the proposed safety review procedures could be viable. Commissioner Ramey expressed his understanding that the existing procedures would govern the port operations of nuclear powered Naval ships until new criteria are implemented.

In reply to a question by Mr. Beck, Captain Riera said if military requirements necessitate setting aside the AEC recommendations regarding a specific port, the matter is normally resolved between the CNO and Admiral Rickover. In reply to a question by Commissioner Palfrey, Commander Nicholson said a monthly report is submitted to Admiral Rickover which indicates the ports entered, the time of entry, and the reason for the entry. He added that the USS BAINBRIDGE's entry into Newport, Rhode Island, was reported as necessary for loading of ASROC missiles.

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Captain Conrad, referring to paragraph 5 of the draft letter to Secretary Korth, proposed that a list presently approved by the Navy of recurrently entered ports be exempted from the report requirement in addition to home ports and yards. Mr. Ink distinguished the home port of a ship from all other ports, and Commissioner Haworth suggested the desirability of handling separately the Navy list of ports recurrently entered. Mr. Price noted that a portion of the AEC letter makes provision for later modification of the procedures.

W. B. McCool
Secretary

[redacted]

DEC 4 1962

[redacted]

CONFIRMED TO BE UNCLASSIFIED *
AUTHORITY: DOE - DP/MA
BY: N Hoppe DATE: 12/11/85

* With Attachment's Table of Contents only
by: JB Hahn 7/24/92

SUBJECT: LEVELS OF FALLOUT IN 1962

For your request, a short survey-type study has been made of possible levels of fallout in 1963. Section I represents the estimates of total and fission yields from U. S., U. K. and U. S. S. R. contributions up through December 25, 1962. The estimates of the yields (particularly fission fractions) of the U. S. S. R. detonations are not firm and may be subject to change. Section II, Attachment 01, is an estimate of the possible fallout level during 1963, from nuclear detonations of 1962, and from debris remaining in the atmosphere from previous years. Section III, Short-Lived Radionuclides, notes a possible problem from these materials. Tables IV through IX are included for information on the tropospheric fallout from nuclear experiments and testing during 1962.

A more complete study is being undertaken to better refine these data and their interpretations, as well as to include additional information required to make estimates of radiation doses to persons. Efforts in being made to complete this study as an early date as is feasible, consistent with the availability of reliable data; it may require as long as two to three months. A progress public release will be prepared, along with the more comprehensive report, for clearance with the Federal Radiation Council and release to the public.

ORIGINAL SIGNED BY
Nathan H. Woodruff

Nathan H. Woodruff, Director
Division of Operational Safety

Attachment:
Study - "Levels of Fallout in 1963"

cc: A. E. Luedecke, GM
E. J. Bloch, AGMD
C. L. Dunham, IM
A. W. Betts, MA
J. A. Kelly, PNE
Office of the Secretary (2)

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RWinzeller:rw	NWoodruff
/ /62	/ /62

[redacted]

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ESTIMATED FALLOUT IN 1963 FROM NUCLEAR WEAPONS TESTS

Sections

I. Fission Yields for United States, United Kingdom and USSR Tests

II. Strontium-90

III. Short-Lived Radionuclides

IV. Iodine-131

V. Fallout from Nuclear Weapons Tests at NTS (Summary Statements)

VI. Fallout from Atmospheric Nuclear Weapons Test in Pacific Area (Summary Statements)

VII. Fallout from Nuclear Tests at Nevada Test Site

VIII. Fallout from Atmospheric Nuclear Weapons Test in Pacific Area

IX. Radioactivity Released by Underground Experiment Near Carlsbad, New Mexico

[redacted]

MH-S-3

12

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Congress of the United States

JOINT COMMITTEE ON ATOMIC ENERGY

November 26, 1962

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Dr. Seaborg:

As you know, the Joint Committee on Atomic Energy maintains a continuous interest not only in advancing nuclear technology in the national interest, but also in assuring ourselves and the public that these programs are being conducted with due regard for the public health and welfare. Recent hearings conducted by the Committee have emphasized the belief that there is confusion in the public mind regarding the role that countermeasures aimed at the reduction of radiation hazards to man should occupy in the program. This confusion is particularly apparent in relation to the hazards from fallout associated with the testing of nuclear weapons.

The Committee therefore feels there is a need to review the status of information relating to possible countermeasures which are now operational, under development, or speculated that can reduce the hazards of radiation to man. In this evaluation, the Committee wishes to concentrate on countermeasures, other than radiation shielding such as provided for by fallout shelters, which can be utilized to counteract or alleviate a hazardous condition after it has occurred. Thus source control measures such as shielding for reactors and the limitation of atmospheric testing of nuclear weapons may be assumed to exist and that these source control measures will be used.

The Committee would appreciate receiving information on the activities now being conducted by your agency as they relate to the following three questions:

1. What countermeasure techniques or capabilities have been (a) developed and have been placed in an operational status for immediate use or (b) have been developed but are not at present available for use?

Copies filed:
in MH-S-3 Fallout
MH-S-3 Contamination
Dr. M-JCAE

11-27-62

2. What research projects or studies directly related to countermeasures are presently under investigation? Also please indicate the present expenditure level on these projects in dollars per year.

3. For what conditions would the countermeasures listed under items 1 and 2 above be both applicable and needed? For example would the particular countermeasure be most appropriate for nuclear war survival or recovery, nuclear accident involving a high level release of radioactivity to the environment, nuclear incident involving high levels of exposure to a large number or to a small number of individuals or for exposures from fallout from nuclear weapons testing?

In answering these questions, consideration should be given to measures, phenomena or mechanisms that can be used to control or influence the movement of environmental radioactivity from the time it enters the environment to the time of its deposition in a body organ. Similarly, consideration should be given to measures, phenomena, or mechanisms that could be used to mitigate or reduce the biological effect of an exposure.

In order to obtain a comprehensive summary of the status of efforts in this field we have also asked the Department of Health, Education and Welfare, Department of Agriculture, Department of Defense and Office of Emergency Planning for similar information.

We would appreciate receiving the above information by December 21, 1962.

Thank you for your assistance to the Joint Committee in this matter.

Sincerely yours,

Chet Holifield

Chet Holifield
Chairman

CLASSIFIED DOUCMENT CROSS-REFERENCE SHEET

DATE: 11/15/62

TO: Dwight A. DMR

FROM: Dr. Nathan H. Woodruff
Dr. Charles H. Reichardt

THIS CLASSIFIED DOUCMENT HAS BEEN REMOVED FROM THE FILES AND PLACED IN A CONSOLIDATED CLASSIFIED FOLDER OF THE SAME TITLE.

CLASSIFIED DOUCMENT CROSS-REFERENCE SHEET

DATE: 11/15/62

TO: Table I

FROM: Atmospheric Nuclear Test yields

THIS CLASSIFIED DOUCMENT HAS BEEN REMOVED FROM THE FILES AND PLACED IN A CONSOLIDATED CLASSIFIED FOLDER OF THE SAME TITLE.

CLASSIFIED DOUCMENT CROSS-REFERENCE SHEET

DATE: Undtd

TO: Strmlkins-90

FROM:

THIS CLASSIFIED DOUCMENT HAS BEEN REMOVED FROM THE FILES AND PLACED IN A CONSOLIDATED CLASSIFIED FOLDER OF THE SAME TITLE.

m/d.s. 3

FEDERAL RADIATION COUNCIL
EXECUTIVE OFFICE BUILDING
WASHINGTON 25, D.C.

November 9, 1962

MEMORANDUM FOR: Members, Federal Radiation Council

SUBJECT: Recommended Statement of "Current Policy Concerning Radioactive Iodine in Fallout" --- Transmittal of Final Draft

As you will recall from Council meetings in August and September, the Working Group had been directed to undertake the further examination of specific problems relating to increases of radioactivity in the environment, using as guidance the Council positions as outlined in correspondence with the Joint Committee on Atomic Energy on August 17 and 29 as well as in the position statement, adopted by the Council at its meeting on September 10.

In carrying out these instructions, the Working Group decided to divide this assignment into two stages: (1) a policy statement to meet the interim need for amplification of the position adopted by the Council in its statement of September 10 concerning radioactive iodine in fallout, and (2) a more comprehensive report on fallout, summarizing the known physical phenomena, the health implications, the present surveillance network, and discussing the applicability of possible countermeasures.

The Working Group has requested that I forward its final draft of the policy statement on radioactive iodine to you for comment and such courses of action which you might wish to recommend to the Chairman of the Council. Should the Council concur that a statement such as the attached draft would be suitable for release at this time, arrangements can be made for this action upon concurrence of all Council members.

T-2-6-11

To the best of my knowledge there are no major differences of opinion within the Working Group relative to this document.

I trust that you will forward your views on this directly to the Secretariat for summation and presentation to the Chairman.

James G. Terrill, Jr.
Chairman, Working Group

Attachment

Not for Release
For Discussion Only

WG/CR/8
11/8/62

[redacted]

RADIATION PROTECTION GUIDANCE FOR FEDERAL AGENCIES

Council Policy Concerning Radioactive Iodine in Fallout

This statement is being issued by the Federal Radiation Council to provide guidance to Federal agencies in conjunction with their radiation protection activities related to radioactive iodine in the environment from fallout.

In 1960 and 1961, the Federal Radiation Council recommended guidance for controlling the exposure of industrial workers and the public from radiation resulting from operations in the nuclear industry. In reaching these recommendations, the Council recognized the responsibility for defining measurable criteria within which the peaceful applications of nuclear energy could be safely developed. These permissive exposure guides, as given in the Council's first two reports, "Background Material for the Development of Radiation Protection Standards," were, and still are, considered to represent health risks so low as to be compatible with the natural development of society for generations to come. The philosophy on which these Guides were founded is in consonance with the

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philosophy of radiation protection as it has been developed over the past three decades by the National Committee on Radiation Protection and Measurements and the International Commission on Radiological Protection.

More recently, with increases in the amount of radioiodine from fallout appearing in the environment and food supplies of man, there has been concomitant interest in considering the need or desirability for instituting precautionary actions against exposure from this source of radiation. In protecting health, primary concern is directed toward the magnitude of exposure, its potential consequences compared to the radiation dose believed to produce medically significant injury, and the possibility of undesirable consequences associated with alternative measures which might be initiated to reduce potential exposure.

Iodine, radioactive and non-radioactive, characteristically tends to concentrate in the human thyroid. Radioactive iodine has the same biological effect on the thyroid regardless of the specific source of the iodine; as a medically indicated tracer administered

[redacted]

[redacted]

for diagnostic purposes; from a plant using or processing nuclear reactor fuels; or from tests of nuclear devices.

In considering health implications of thyroid irradiation, consultants to the Federal Radiation Council have concluded that radiation dose many times higher than the Radiation Protection Guide for the thyroid would be necessary to produce a detectable increase in adverse health effects --- specifically, thyroid cancer. Other biological effects, either somatic or genetic, are believed to be quantitatively even less important.

When sources of potential exposure which cannot be controlled at the point of origin are involved, and other means of exposure control may be indicated, full consideration must be given to the direct and indirect effects of such measures on the public, health, agriculture, industry and government. Such actions should be considered when it is believed that inherent health risks of a specific precautionary measure are less than potential health risks due to the exposure, but action should be instituted only when the total impact of the measure is less than the health risk due to exposure.

[redacted]

[redacted]

Radiation exposure from fallout from nuclear weapons tests in the range of existing guides for industrial application involves risks so slight that control measures may have a net adverse, rather than favorable, effect on public well-being. The Council believes that in situations where source control is practicable, the Guides should be applied as originally promulgated. In situations not subject to this control, however, such as resultant from [illegible] fallout, it is consistent with the general philosophy of Radiation Protection Guides to use different criteria in determining when specific precautionary measures should be instituted. For example, guidance designed to limit the controllable release of radioactive material into the environment are appropriately much lower than levels at which detectable health effects may result.

The Federal Radiation Council therefore recommends that the guidance outlined in the accompanying table be used specifically in assessing the need for control action for exposures from radioiodine in the environment due to the testing of nuclear weapons.

This guidance is intended for administrative use by Federal agencies in planning and implementing radiation protection pro-

[redacted]

[redacted]

grams in connection with radioactive iodine in fallout. Federal agencies are requested to provide assistance to State and local agencies in accordance with the guidance of the Council and to apprise the Council of their activities in this area.

As desirable as many believe it would be for the Council to designate specific control measures, it acts by providing guidance to the agencies of Government most directly involved in programs of this type in developing specific measures and operational criteria for determining when and how these should be effected. Those Federal agencies which deal most directly with the public should be prepared to develop the administrative and technical features of specific alternative measures which lie within their statutory responsibilities. For tasks which the agencies cannot undertake individually, the Council will assist in the development of coordinated plans.

* * * * * * *

[redacted]

[redacted]

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For Discussion Only

WG/CR/8
11-4-62
- 8 -

GUIDANCE FOR ASSESSMENT OF RADIOIODINE IN THE ENVIRONMENT FROM FALLOUT

	Annual Radioiodine* Intake (I-131)	Average Thyroid Dose Equivalent (Infant)	Risk Assessment	Indicated Action
(A)	36,500 μμc	0 - 0.5 Rem	Acceptable. Comparable with natural background	No protective action indicated. Surveillance and exposure evaluation maintained.
(B)	36,500 μμc to 365,000 μμc	0.5 - 5 Rems	Acceptable, with slightly increased risk. Health risk from radiation exposure is less than or comparable to overall effects associated with protective action.	Increased exposure evaluation. Technical advice and assistance provided by Federal agencies. Generally no protective action indicated.
(C)	Above 365,000 μμc	Above 5 Rems	Health risk increases in proportion to the magnitude of the exposure and the number of people exposed.	Appropriate protective actions. Feasible and available means of reducing exposure at State and local level indicated. Technical assistance and advice by Federal agencies.

* - Cumulative level over any period of 12 consecutive months.
- μμc --- micromicrocuries (unit of measurement of radioactivity)

[redacted]

Not for Release
For Discussion Only

WG/CR/8
11/8/62

[redacted]

RADIATION PROTECTION GUIDANCE FOR FEDERAL AGENCIES

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philosophy of radiation protection as it has been developed over the past three decades by the National Committee on Radiation Protection and Measurements and the International Commission on Radiological Protection.

More recently, with increases in the amount of radioiodine from fallout appearing in the environment and food supplies of man, there has been concomitant interest in considering the need or desirability for instituting precautionary actions against exposure from this source of radiation. In protecting health, primary concern is directed toward the magnitude of exposure, its potential consequences compared to the radiation dose believed to produce medically significant injury, and the possibility of undesirable consequences associated with alternative measures which might be initiated to reduce potential exposure.

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for diagnostic purposes; from a plant using or processing nuclear reactor fuels; or from tests of nuclear devices.

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When sources of potential exposure which cannot be controlled at the point of origin are involved, and other means of exposure control may be indicated, full consideration must be given to the direct and indirect effects of such measures on the public, health, agriculture, industry and government. Such actions should be considered when it is believed that inherent health risks of a specific precautionary measure are less than potential health risks due to the exposure, but action should be instituted only when the total impact of the measure is less than the health risk due to exposure.

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[redacted]

Radiation exposure from fallout from nuclear weapons tests in the range of existing guides for industrial application involves risks so slight that control measures may have a net adverse, rather than favorable, effect on public well-being. The Council believes that in situations where source control is practicable, the Guides should be applied as originally promulgated. In situations not subject to this control, however, such as resultant from fallout, it is consistent with the general philosophy of Radiation Protection Guides to use different criteria in determining when specific precautionary measures should be instituted. For example, guidance designed to limit the controllable release of radioactive material into the environment are appropriately much lower than levels at which detectable health effects may result.

The Federal Radiation Council therefore recommends that the guidance outlined in the accompanying table be used specifically in assessing the need for control action for exposures from radioiodine in the environment due to the testing of nuclear weapons.

This guidance is intended for administrative use by Federal agencies in planning and implementing radiation protection pro-

[redacted]

[redacted]

grams in connection with radioactive iodine in fallout. Federal agencies are requested to provide assistance to State and local agencies in accordance with the guidance of the Council and to apprise the Council of their activities in this area.

As desirable as many believe it would be for the Council to designate specific control measures, it acts by providing guidance to the agencies of Government most directly involved in programs of this type in developing specific measures and operational criteria for determining when and how these should be effected. Those Federal agencies which deal most directly with the public should be prepared to develop the administrative and technical features of specific alternative measures which lie within their statutory responsibilities. For tasks which the agencies cannot undertake individually, the Council will assist in the development of coordinated plans.

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11-9-62
- 6 -

GUIDANCE FOR ASSESSMENT OF RADIOIODINE IN THE ENVIRONMENT FROM FALLOUT

	Annual Radioiodine* Intake (I-131)	Average Thyroid Dose Equivalent (Infant)	Risk Assessment	Indicated Action
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(B)	36,500 μμc to 365,000 μμc	0.5 - 5 Rems	Acceptable, with slightly increased risk. Health risk from radiation exposure is less than or comparable to overall effects associated with protective action.	Increased exposure evaluation. Technical advice and assistance provided by Federal agencies. Generally no protective action indicated.
(C)	Above 365,000 μμc	Above 5 Rems	Health risk increases in proportion to the magnitude of the exposure and the number of people exposed.	Appropriate protective actions. Feasible and available means of reducing exposure at State and local level indicated. Technical assistance and advice by Federal agencies.

* - Cumulative level over any period of 12 consecutive months.
- μμc --- micromicrocuries (unit of measurement of radioactivity)

[redacted]

TM 0-S-3

UNCLASSIFIED

November 1, 1962

AEC 604/70

COPY NO. 77

ATOMIC ENERGY COMMISSION

ENVIRONMENTAL RADIOIODINE PROBLEM

Note by the Secretary

The General Manager has requested that the attached memorandum from the Director, Division of Biology and Medicine, be circulated for the information of the Commission.

W. B. McCool
Secretary

AEC 604/70

DISTRIBUTION	COPY NO.	DISTRIBUTION	COPY NO.
Secretary	1	Technical Information	42
Commissioners	2 - 6,83	Inspection	43
General Manager	7 - 8	Military Application	44
Dir. of Regulation	9	Operational Safety	45
Deputy Dir. of Regulation	10	Peaceful Nuclear Expl.	46
Deputy Gen. Mgr.	11	Production	47 - 50
Asst. Gen. Mgr.	12	Radiation Standards	51
Asst. GM-Plans & Prod.	13	Reactor Development	52 - 60
Asst. GM Operations	14	Manager, Naval Reactors	61
Asst. Gen. Mgr. R&D	15	Research	62 - 63
Asst. Gen. Mgr. Adm.	16	Albuquerque Oprns.	64 - 66
General Counsel	17 - 21	Hanford Oprns.	67
Biology & Medicine	22 - 31	Idaho Oprns.	68 - 69
Congr. Liaison	32	Nevada Oprns.	70 - 71
Contracts	33 - 35	Savannah River Oprns.	72 - 73
Controller	36 - 38	D. C. Office	74 - 76
Laboratory Program	39	Secretariat	77 - 82
Public Information	40 - 41		

X-TM 0-S-3 Radioactive Fallout

11-1-62

UNCLASSIFIED

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : A. R. Luedecke, General Manager
Through S. G. English, AGMRD

DATE: October 24, 1962

FROM : Charles L. Dunham, M.D., Director
Division of Biology and Medicine

SUBJECT: ENVIRONMENTAL RADIOIODINE PROBLEM

Attached for your information is a preliminary plan for intensified research on the environmental radioiodine problem. This is a first step in translating into action the discussions on this topic which Division staff members have had during the past month with yourself, Commissioner Haworth, Mr. Ink, Dr. English, Dr. Dunning, Dr. Tompkins, and Mr. Kelly.

After the discussion on September 20, it was agreed that the Division of Biology and Medicine, with consideration for the needs and interests of Mr. Kelly, as well as of Drs. Western and Woodruff, would develop such a plan. In order to do this on a satisfactory basis, it will of course be necessary to arrange with various AEC laboratories and other contractors for their participation in the work, and will probably require about three months for development of a definitive plan. This plan will be presented to the Commission when completed.

This memorandum is an interim report on a preliminary plan developed by the Staff of the Division of Biology and Medicine. It is subject to changes which will undoubtedly occur as program details are discussed with the laboratories and contractors concerned. This preliminary plan also does not indicate program levels or costs, but such data will be included in the plan to be submitted. In the meantime, we will be taking specific steps to carry out such portions of the work as can be done under current programs. These actions will be carried out within the fund levels currently provided for the Biology and Medicine program for FY 1963.

Attachment
As noted above

UNCLASSIFIED

PRELIMINARY PLAN FOR INTENSIFIED RESEARCH ON THE ENVIRONMENTAL RADIOIODINE PROBLEM

The Problem. To improve the basis for predicting the creation, distribution through the atmosphere, movement through food chains, uptake in people, and, therefore, also the subsequent biological effects of radioiodine to be produced by any proposed program for the testing of nuclear weapons, or as a result of other peaceful or military uses of atomic energy.

In the early period of testing of nuclear weapons it was believed that where the external gamma radiation exposure was acceptable, internal exposures would be acceptable. With increasing knowledge of fallout phenomena and radiation effects, internal exposures resulting from specific fallout radionuclides were given greater attention and were considered as possibly more important than was believed earlier. With the subsequent reduction of acceptable levels of internal deposition of some nuclides, greater emphasis was made on measurements of these nuclides. The greater detail in knowledge of fallout radioiodine which resulted from increased environmental measurement, led to the suspicion that radioiodine could be responsible for a larger portion of the potential human dose due to fallout and that the potential dose from radioiodine might become a limiting factor if current radiation protection guides were applied.

Because of the 8-day half-life of I^{131} which places severe limitations on its detailed study, as compared with longer-lived components of fallout, much information which is needed to estimate its potential dose is lacking. These estimates generally require at least approximations or knowledge of the following:

a. Yield and circumstances of release of the radioisotopes of iodine and their precursors.

b. The characteristics of deposition of radioiodine, including chemical and physical interactions with other materials in the atmosphere.

c. The movement of radioiodine through food chains.

d. The deposition in and retention by man from ingestion of radioiodine in foods and from its inhalation.

Knowledge is needed also of the biological effects of radioiodine deposited in human tissues. Experimental work on this aspect of the problem is not proposed herein but a sound investigation of this subject needs to be made.

Probably this could be done best by assembling from the literature and from knowledgeable experts the most reliable information which can be brought to bear upon the relation of the radiation dose produced by radioiodine deposited and the biological injury created thereby.

Information has been and continues to be obtained in regard to all of the above through various research programs. Because of this, dose estimates are possible although their adequacy is limited by current knowledge in these areas and the applicability of this knowledge to fall-out situations. The program being considered here has as its primary purpose the improvement of the basic information necessary to provide better estimates of potential biological hazards of radioiodine. It appears that an intensified program in this area of research is urgently required.

Outline of Program. From the technical viewpoint, it is proposed that the following four parallel approaches be taken:

(1) More analysis of past data from the areas which have been exposed to radioiodine from weapons tests or other nuclear operations.

(2) More thoroughly prepared field measurement programs in connection with future releases of radioiodine to the atmosphere including:

(a) Atmospheric weapons test if any

(b) Plowshare tests

(c) Rover tests

(d) Routine waste disposal at Hanford, Savannah River and Idaho Falls.

(3) Design studies of field experiments which would be feasible if special tests could be conducted in which all controllable aspects of the radio-iodine release were dictated by the requirements of the experiment.

(4) Studies conducted under controlled laboratory conditions and not requiring environmental contamination, notably those related to human thyroid uptake from milk, total diet and air.

From the standpoint of program administration the following four categories of actions are proposed:

(1) Augmentation of going projects

(2) Additional laboratory projects

(3) A permanent facility for studies at the Nevada Test Site

(4) A major new centrally coordinated program.

These four proposed lines of action are discussed below.

1. Augmentation of going projects. As mentioned above current studies are being conducted which attempt to refine our knowledge of radioiodine as it is related to nuclear operations. The individual projects are listed in ANNEX A. These studies are being conducted at major Commission installations and in the off-site research contracts program. A number of these studies are capable of augmentation which would assist the overall program in some areas. It is proposed to analyze these and through discussion of the problems with investigators, utilize these existing projects as far as possible for this purpose. Other fallout studies are being conducted which would assist the program if studies of radioiodine were included. Since most of these studies now in progress involve long-lived radionuclides, alterations will be necessary in these projects for inclusion of radioiodine studies. Attempts will be made to modify or augment such projects at Colorado State University, the University of California at Los Angeles, and the University of Nevada where studies of longer-lived fallout nuclides are in progress. Modification of the fallout deposition program will be made to include additional radioiodine analyses commensurate with sampling and processing times. It is to be noted that field studies of fallout radioiodine are dependent on the timely deposition of fresh fission debris at specific locations. For this reason it is considered most efficient to obtain necessary geographical coverage by utilizing existing projects so far as possible, with the addition of suitable sampling and analysis instrumentation, and perhaps with the provision of some mobile sampling capability. It is proposed that this be accomplished, and to include radioiodine studies in new field projects where practical.

2. Additional laboratory projects. A number of radioiodine studies may be carried on in the laboratory as some existing studies are. Particularly, some studies, related to radiation effects and plant, animal and human metabolism of iodine (for example, human thyroid uptake from milk), may be conducted without actual fallout radioiodine. An effort will be made to increase the number of such studies especially in technical areas determined to be deficient with respect to requirements mentioned above. Possible projects for these studies are the University of Tennessee-AEC, Agricultural Research Laboratory, Cornell University, Hanford Laboratories,

University of California at Los Angeles, Colorado State University, and the U. S. Department of Agriculture.

3. A permanent facility for studies at the NTS. In connection with other aspects of the Fallout Studies Program it has become evident that planning and conducting fallout studies in connection with specific nuclear tests require a more efficient organization. Since most fallout studies must be conducted on a non-interference basis and with short planning times, it seems appropriate to investigate the feasibility of establishing an organization at the Nevada Test Site with the specific responsibility for planning and equipping for field studies associated with future tests. Such an organization could remain prepared for fallout studies and provide a cadre on which the studies would be based. During non-testing periods longer-term projects as well as preparations could be continued by this organization. This organization would include studies of fallout radioiodine as well as other nuclides in its program.

4. A major new centrally coordinated program. Since there are a large number of specialized technical areas involving the physical and chemical aspects of fallout radioiodine, especially those during and shortly after a nuclear event, it seems desirable to place the management and coordination of this portion of the program under a single major Commission facility. The UCLRL Livermore Laboratory has been suggested as one which could be asked to undertake the management of a radioiodine program. It is felt that this Laboratory is well qualified to take responsibility for those aspects of the radioiodine program in the general area of physical and chemical studies. The experience of the Laboratory in planning and conducting nuclear detonations, PLOWSHARE and other activities, evaluation of safety problems, analyzing nuclear debris for radionuclides and conducting various physical studies in the field provides it with unique capabilities which can be applied to the radioiodine problem.

Specific areas of study which would seem appropriate for management by a center located at the Livermore Laboratory are as follows:

a. Collect, review and evaluate all I^{131} data from past tests, especially shot SEDAN for which considerable data were obtained.

b. Develop a program of radioiodine studies in connection with future Plowshare experiments.

c. Plan and conduct theoretical and experimental studies of the yields and physical and chemical characteristics of fallout isotopes of iodine.

d. Plan and conduct studies of the history of radioiodine in the atmosphere and its deposition on vegetation.

e. Evaluate the possible need for conducting one or more nuclear detonations specifically for studies of fallout.

f. Assist and advise other research groups in planning and conducting field studies of fallout radioiodine.

It is estimated that substantial progress in developing a more definite plan to improve the fallout radioiodine program will be made within the next three months. A status paper will be submitted to the Commission within three months. Contacts with other agencies known to be intensifying their efforts on this problem will also be strengthened, if necessary, to provide adequate coordination of related efforts and avoid unnecessary duplication.

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ANNEX A

LIST OF RESEARCH PROJECTS WHICH INCLUDE STUDIES OF RADIOIODINE APPLICABLE TO FALLOUT

OFF-SITE PROJECTS

University of California (Berkeley). Soil Chemistry. (Includes iodine).

University of California (Berkeley). Studies on the Induction of Thyroid Cancer.

Colorado State University. A Study of the Food Chain Pattern of Strontium-90, Cesium-137 and Iodine-131 in a Wild Deep Population.

Columbia University. Pathologic Effects in Fishes Exposed to Radioactive Iodine from Fallout.

Cornell University. I. Fission Product Metabolism and Response in Laboratory and Domestic Animals. (Includes studies of seasonal effects of uptake of I^{131}, secretion into milk and the degree of concentration from plasma to milk; the effects on I^{131} metabolism of administration of stable iodine and the effects of feeding stable iodine; and the feasibility of feeding stable iodine to cows to reduce concentrations of I^{131} in milk)
II. Planning Study for Evaluation of Radioactive Contamination of Food Chain.

Duke University. Determination of the Extent of Root Distribution by Use of Radiotracer Techniques. (Includes movement of I^{131} in soils).

State University of Iowa. Radioiodine Studies of Human Fetal and Other Thyroids.

Isotopes, Incorporated. Interpretation of Westwood, N.J., Fallout Data (Includes analyses of precipitation collections for I-131)

Massachusetts General Hospital (Boston). Effect of Radioactive Iodine on Biology of the Thyroid Gland.

University of Michigan. Effect of I^{131} on the Fetus.

University of Minnesota. The Removal of Strontium Radioisotopes from Milk and Physiological Sites of Discrimination Between Strontium and Calcium (includes studies of intestinal absorption of iodine).

U. S. Naval Radiological Defense Laboratory. The Formation, Distribution and Characteristics of Radioactive Fallout.

New York University. Distribution of Radionuclides in Human Tissues (Includes I^{131} in normal living human beings and autopsy tissues).

Nuclear Science and Engineering Corporation (Pittsburgh). 1. Survey of Iodine-129 Concentrations and the Radiation Dose to Humans. 2. The Chemical and Physical States of Fission Product Iodine in Fallout.

University of Pittsburgh. Radioecology of Small Vertebrate Species under Natural Environments of Varying Stress (Includes injected I^{131}).

University of Tennessee (Memphis). Studies in Iodine Metabolism (Includes routine measurement of I^{131} in thyroids of swine, sheep, cattle and human beings from several locations).

Western Reserve University. A Study of the Physiological Function and Histochemical Changes of Thyroids Irradiated with Radioactive Iodine.

ON-SITE PROJECTS

Argonne National Laboratory. Exposure to Radioelements (Includes I^{131})

University of California at Los Angeles. 1. Radiation Ecology (includes studies of uptake and retention of I^{131} in desert and laboratory rodents) 2. Soil Plant Factors. (Includes studies of the chemistry in soils and the physiological processes influencing the uptake by plants of I^{131}). 3. Fate and Persistence Studies of Contaminated Environments (Includes studies of fallout I^{131} surface deposition, incorporation in plants and uptake in animals from nuclear tests at the Nevada Test Site). 4. Nuclide Metabolism in Man (Includes I^{131}).

Hanford Laboratories. 1. Iodine Contamination and its Removal from Vegetation. 2. Biological Effects of I^{131} in Sheep and Swine. 3. Toxicity and Metabolism of Inhaled Radioactive Particles (I^{131} vapor) in Rats and Dogs. 4. Study of I^{131} in thyroids of Wild Animals (Collections made in Alaska, California, Texas and on-site).

Health and Safety Laboratory. Studies of Radioactive Debris from Nuclear Tests and Natural Radioactivity (includes analyses of I^{131} in individual rain samples from the fallout deposition program, and identification of I^{131} by gamma spectroscopy on high altitude balloon flights and on filters collected by high altitude balloons).

Lawrence Radiation Laboratory. (Berkeley) Long-term Study in Humans on the Effects of Internal Irradiation from Therapeutically Administered Isotopes (Includes I^{131}).

Lovelace - U. S. AEC (Albuquerque) Biological Consequences of Inhaling Fission Products Singly and as Mixtures (Includes I-131).

University of Rochester (Therapeutic program only).

FORM AEC-204
(9-47)

DATE:

INDEX: MR&S-3-Radiation

[redacted]

TO:

FROM:

SUMMARY: AEC 811/110: IODINE-131 FROM SEDAN EVENT. Memo to the General Manager from the Director, Div. of Peaceful Nuclear Explosives with an attached copy of a preliminary report, by the Lawrence Radiation Laboratory, Livermore (LRL) analysing data on Iodine-131 from the Sedan event. The Sedan experiment involved the detonation of a 100 kt device buried at a depth of 635 feet in the desert alluvium at the Nevada Test Site.

FILED:

INDEXER: MR&A-12-Plowshare

REMARKS: date of paper: 10-15-62
date of memo: 10-1-62

U. S. ATOMIC ENERGY COMMISSION

CORRESPONDENCE REFERENCE FORM

10/15/62

☆U. S. GOVERNMENT PRINTING OFFICE—1955—[illegible]

M/H6 p.3 Reduction

UNCLASSIFIED

September 18, 1962

AEC 604/69

COPY NO. 62

ATOMIC ENERGY COMMISSION

FRC POSITION ON CURRENT FALLOUT LEVELS

Note by the Secretary

AEC 604/69

The Director of Regulation has requested that the attached FRC press release on current fallout levels be circulated for the information of the Commission.

W. B. McCool
Secretary

DISTRIBUTION	COPY NO.
Secretary	1
Commissioners	2 - 6,68
General Manager	7 - 8
Dir. of Regulation	9
Deputy Dir. of Regulation	10
Deputy Gen. Mgr.	11
Asst. Gen. Mgr.	12
Asst. GM-Plans & Prod.	13
Asst. GM Operations	14
Asst. Gen. Mgr. R&D	15
Asst. Gen. Mgr. Adm.	16
General Counsel	17 - 21
Biology & Medicine	22
Compliance	23 - 29
Congr. Liaison	30
Public Information	31 - 32
Inspection	33
Licensing & Regulation	34 - 35
Military Application	36
Operational Safety	37
Operations Analysis	38
Peaceful Nuclear Expl.	39
Production	40 - 43
Rad. Prot. Standards	44 - 48
Reactor Development	49 - 57
Manager, Naval Reactors	58
D. C. Office	59 - 61
Secretariat	62 - 67

X-O.M-7- FRL

9/18/62

UNCLASSIFIED

FEDERAL RADIATION COUNCIL
EXECUTIVE OFFICE BUILDING
WASHINGTON 25, D.C.

FEDERAL RADIATION COUNCIL
POSITION ON CURRENT FALLOUT LEVELS

Radiation protection guides prepared by the Federal Radiation Council and published in the Federal Register, September 26, 1961 established a graded series of appropriate actions related to three ranges of transient daily rates of intake of radioactive materials by exposed population groups. Some have interpreted this guidance as indicating that action in the form of preventive health measures must be taken when upper levels of Range II were reached.

An extensive national surveillance program provides the basis for a continual determination of the levels of radioactivity in air, water, soil, and milk and other foods. In some localities in the United States average annual intake values of radioactive iodine have approached the upper level of Range II and, in one locality, have slightly exceeded Range II. This had led to actions and proposed actions involving countermeasures or preventive health measures. The Federal Radiation Council does not recommend such actions under present circumstances.

Although some evidence has recently become available that the risks associated with exposures within the levels expressed by the guides for radioactive iodine may be even less than had been anticipated, it is not proposed at this time to change the guides. They were primarily devised for the industrial field and one of the most important reasons for their selection, the relative feasibility of compliance, still exists.

The Council believes, based on competent scientific advice, that any possible health risk which may be associated with exposures even many times above the guide levels would not result in a detectable increase in the incidence of disease.

The Radiation Protection Guides are not a dividing line between safety and danger in actual radiation situations nor are they alone intended to set a limit at which protective action should be taken or to indicate what kind of action should be taken. As applied to fallout, guides can be used as an indication of when there is a need for detailed evaluation of possible exposure risks and when there is a need to consider whether any protective action should be taken under all the relevant circumstances.

The Council believes that individual fallout situations require individual evaluation before specific action is taken. Such an evaluation must involve a careful examination of the source and magnitude and duration of the probable exposure levels as well as the health significance of these probable exposures balanced against the total impact of health protection measures.

Radiation exposures anywhere near the guides involve risks so slight that countermeasures may have a net adverse rather than favorable effect on the public well-being. The judgment as to when to take action and what kind of action to take to decrease exposure levels involves consideration of all factors.

The Federal Radiation Council recognizes the need for additional guidance related to fallout. The Council has directed appropriate Federal agencies to keep it continuously advised on the fallout situation, particularly with respect to local situations requiring evaluation. The Council, acting through its member agencies will, when requested, provide consultation

and technical assistance in the event that there is concern about fallout levels in any part of the country.

In addition, the Federal Radiation Council will prepare a report on fallout summarizing the known physical phenomena, the health implications, the present surveillance network, and discussing the applicability of possible countermeasures. The Council, in consultation with experts within and outside the Government, including members of the National Academy of Sciences' Committees on Biological Effects of Atomic Radiation and the National Committee on Radiation Protection and Measurements, is continually examining the criteria upon which action involving preventive health measures might properly be taken. From time to time, as in the past, the Council will issue reports in this area to assist responsible authorities and to inform the public.

* * * * * *

MHS.3

UNCLASSIFIED

September 17, 1962

AEC 604/68

COPY NO. 67

AEC 604/68

ATOMIC ENERGY COMMISSION

APPLICATION OF RADIATION PROTECTION STANDARDS

Note by the Secretary

The Office of the Chairman has requested that the attached JCAE press release and enclosures be circulated for the information of the Commission.

W. B. McCool

Secretary

DISTRIBUTION	COPY NO.	DISTRIBUTION	COPY NO.
Secretary	1	Public Information	31 - 32
Commissioners	2 - 6,73	Inspection	33
General Manager	7 - 8	Licensing & Regulation	34 - 35
Dir. of Regulation	9	Military Application	36
Deputy Dir. of Regulation	10	Operational Safety	37
Deputy Gen. Mgr.	11	Operations Analysis	38
Asst. Gen. Mgr.	12	Peaceful Nuclear Expl.	39
Asst. GM-Plans & Prod.	13	Production	40 - 43
Asst. GM Operations	14	Radiation Standards	44 - 49
Asst. Gen. Mgr. R&D	15	Raw Materials	50 - 51
Asst. Gen. Mgr. Adm.	16	Reactor Development	52 - 60
General Counsel	17 - 21	Manager, Naval Reactors	61
Biology & Medicine	22	Researoh	62 - 63
Compliance	23 - 29	D. C. Office	64 - 66
Congr. Liaison	30	Secretariat	67 - 72

X-Gen.-7-JCAE

9-17-62

UNCLASSIFIED

From the Office of the Joint Committee on Atomic Energy

For Release August 23, 1962
Thursday A.M. papers

EXCHANGE OF LETTERS CONCERNING APPLICATION OF RADIATION PROTECTION STANDARDS BETWEEN JOINT COMMITTEE AND FEDERAL RADIATION COUNCIL RELEASED BY JOINT COMMITTEE ON ATOMIC ENERGY

An exchange of letters between the Joint Committee on Atomic Energy and the Federal Radiation Council on major unresolved questions concerning the applications of radiation protection standards were released today by Congressman Chet Holifield, Chairman of the Joint Committee on Atomic Energy, and Congressman Melvin Price, Chairman, Subcommittee on Research, Development and Radiation.

Following testimony by Surgeon General Luther Terry at the Joint Committee hearings on "Radiation Standards, Including Fallout" held June 4-7, 1962, the Joint Committee requested the Federal Radiation Council to clarify its position on the criteria being used to determine when undesirable levels of radioactive debris from fallout were reached. This important question was posed by the Joint Committee as early as its 1959 hearings on "Fallout From Nuclear Weapons Tests."

On June 18, 1962 Chairman Holifield and Congressman Price wrote to Chairman Ribicoff of the Federal Radiation Council requesting information concerning (1) the role of the FRC's Radiation Protection Guides (RPG), particularly in relation to iodine-131; and (2) what Federal agencies were responsible for invoking protective countermeasures in the event radiation levels became unduly high. The need for resolving these matters was indicated as "increased by the recent resumption of atmospheric nuclear tests by the Soviet Union and the United States."

The first question in the letter of June 18 was concerned with whether the numerical values in the Radiation Protection Guides establish the sole or principal criteria for evaluating undesirable levels of radiation from fallout. Secondly, if so, are these numerical values sufficient to indicate when and what action is appropriate to protect public health? Thirdly, if not, is further or supplementary criteria needed and whose responsibility is it to develop and implement such criteria? An additional request was made in the Joint Committee letter of June 18, concerning the views of the FRC on the current status of legal authority and responsibility for invoking countermeasures or taking any other action should radioactivity from fallout reach undesirable levels.

On August 16, 1962 Congressmen Holifield and Price sent a letter to the FRC to further supplement the letter of June 18, 1962. The letter stated in part:

> "The urgency of this review is pointed up by the recent resumption of atmospheric nuclear testing by the Soviet Union and reports of sharp increases in radioiodine levels in Nevada and Utah from U.S. tests. The latter situation, as you know, caused local public health officials in Utah to invoke plans for the diversion of

fresh milk into forms carrying lower levels of radioactivity."

"We do not imply that the current levels of radioactivity have reached a danger point. Indeed, we are satisfied that they are apparently within the current acceptable limits of the Radiation Protection Guides. However, we are not convinced that these Guides presently apply to fallout, nor that they should apply to fallout as presently set forth....."

"Thus, there is a necessity to clarify the meaning of the Radiation Protection Guides in order that they may be understood by the public and by those officials of the Government who will have the responsibility for invoking countermeasures in the event radioactivity levels reach undesirable proportions."

The Federal Radiation Council under the chairmanship of Chairman Celebrezze replied by letter dated August 17, 1962. The letter pointed out the differences between fallout and other sources of radiation which the RPGs were developed to control, stating:

"As applied to fallout, the Guides can be used as an indication of when there is a need for detailed evaluation of possible exposure hazards and a need to consider whether any protective action should be taken under all the relevant circumstances.

"But once we are alerted to the need to consider protective action, the Guides do not tell us when to act or what to do. These judgments require careful consideration of local conditions and the impact of available health protection measures. The Council believes that individual fallout situations require individual evaluation before specific action is taken."

As a summary with respect to the Guides, the Council stated:

"The Guides are not intended to be a dividing line between safety and danger. We have assumed that there is some slight risk to health from any level of radiation exposure, however low, even at or below the low levels set by the Guides. At the same time we do not believe there is any risk of a major health hazard until exposure levels are many times above the Guide levels. For example, there is borne out in relation to iodine-131 by the report to the Federal Radiation Council of the National Academy of Sciences, 'Pathological Effects of Thyroid Irradiation,' July 1962."

As to responsibilities for invoking protective measures, the Council stated:

"Within the Federal Government, authority now exists under the Federal Food, Drug, and Cosmetic Act to control the shipment of adulterated food in interstate commerce. By definition, foodstuffs containing excessive radioactivity would be adulterated. States have the authority to control intrastate distribution or sale of

adulterated foods, which would include foodstuffs containing excessive amounts of radioactivity. State food and drug laws vary widely in their scope and adequacy with respect to the problem of radioactivity in foods. The Public Health Service has the general responsibility to recommend appropriate health protection measures to States and local authorities and to the general public."

Congressmen Holifield and Price stated that the Joint Committee would study the FRC letter to determine whether the answers were adequate, but indicated:

"We seem to be making some progress in clarifying this important subject."

Copies of the exchange of correspondence are attached.

Attachments:
(1) Letter from JCAE dated 6/18/62 to Chairman, Federal Radiation Council with letter dated 1/16/62 from Cong. Holifield to the President
(2) Letter dated 8/16/62 from JCAE to Jones, HEW
(3) Letter dated 8/17/62 from Chairman FRC to JCAE

UNCLASSIFIED

CONGRESS OF THE UNITED STATES
Joint Committee on Atomic Energy

June 18, 1962

Honorable Abraham Ribicoff
Chairman
Federal Radiation Council
Washington, D. C.

Dear Mr. Chairman:

In reviewing the record of our recent hearings on "Radiation Standards, Including Fallout," there are apparently a number of unresolved questions, which had also been left open after our 1960 hearings on "Radiation Protection Criteria and Standards." The need for resolving these matters is increased by the recent resumption of atmospheric nuclear tests by the Soviet Union and the United States.

Our first question concerns the relation between the Radiation Protection Guides (RPG) promulgated by the Federal Radiation Council and the incidence of radioactive fallout as a result of nuclear weapons testing.

At the 1960 hearings, Dr. Chadwick, then secretary of the FRC, was asked by Mr. Holifield whether the new RPGs applied to "problems which may develop in relation to fallout . . ." His response was:

> "Sir, as indicated in the testimony, special problems would require special consideration by the Council."

When requested by the Committee to further clarify this matter, the Federal Radiation Council commented as follows:

> " . . . The Council is aware that the numerical values of the Radiation Protection Guides and Radioactivity Guides may also be interpreted to apply to normal peacetime situations in contrast to 'normal peacetime operations.' When used in this way, the Guides may be considered to define environmental levels consistent with normal peacetime situations based on the levels of environmental radioactivity regardless of its source. In this sense, the graded series of ranges related to the intake of radioactive materials provided in Report No. 2 may be taken to indicate the general conditions under which special consideration must be given and possible corrective actions considered."

The testimony on this point at our recent hearings continued to be clouded. The testimony of Dr. Russell Morgan implied that countermeasures should be ordered when radiation doses reached,

or showed signs of reaching, the levels prescribed in the radiation protection guides. The thrust of the recent National Advisory Committee on Radiation (NACOR) report is to the same effect.

Surgeon General Terry's statement, in releasing the NACOR report, was as follows:

> "If daily intakes are above this level (Range II of the RPG) and into Range III and are likely to persist, then exceeding the RPG becomes a distinct possibility, and in such circumstances countermeasures are to be considered."

It is thus the implication of the Surgeon General's statement, the NACOR report, and Dr. Morgan's testimony, that the FRC's radiation protection guides may be applicable in determining when unacceptable concentrations of radioactive nuclides from fallout have been reached.

On the other hand, we have seen plain evidence from the Introduction to Report No. 1 of the Federal Radiation Council that, "Only peacetime uses of radiation which might affect the exposure of the civilian population are considered at this time." Report No. 2 repeated the statement contained in Report No. 1 that, "The guides recommended herein are appropriate for normal peacetime operations."

Furthermore, the guides have been repeatedly described as consistent with, and based on, the same evidence as NCRP levels and recommendations, which are universally acknowledged to be based on non-military activities.

Moreover, testimony at our hearings, particularly that of Dr. Gordon M. Dunning of AEC, emphasized that the RPGs are based on a balancing of risk against benefit in the context of peacetime operations and that to use them in deciding when to invoke countermeasures against fallout is an "improper use of those guides." Dr. Dunning emphasized that the questions of the applicability of the guides to fallout "should be clarified at once before there is further confusion and before there may be an ill-advised action taken by some regulatory body."

We deem it of utmost importance to have your response to the following questions:

(1) Are the numerical values of the radiation protection guides established by the Federal Radiation Council the sole or principal criteria now used in evaluating when undesirable levels of radioactive nuclides from fallout have been reached?

(2) If so, is this use of the present numerical values of the guides sufficient to indicate when and what action is appropriate to protect public health?

(3) If not, is the development of further or supplementary criteria needed; and if so, is it the responsibility of the Federal Radiation Council or of the Public Health Service or others to develop and implement such criteria?

You are undoubtedly aware that the Chairman of the Joint Committee, in a letter to the President dated January 16, 1962, suggested that the FRC should review the possible effect of fallout from proposed U.S. testing (copy attached). We, of course, do not necessarily believe that the FRC guides should constitute the criteria if they were not so intended. However, we do believe that all significant additions of radioactivity to the environment including fallout should be reviewed by the FRC and evaluated against appropriate standards.

The other important matter left open after our hearings is, where does the legal responsibility and authority lie for invoking countermeasures?

During the testimony of the Surgeon General, he was asked the following question by the Committee staff:

> "Does the Public Health Service have the legal authority to initiate such countermeasures as banning the sale of fresh milk and requiring special processes to decontaminate food stuffs?"

His reply was:

> "We certainly have the responsibility for the surveillance and for making the recommendations. I am not absolutely certain just exactly where our legal /authority is/ or how far our legal authority extends."

It was noted in the hearings that the actual implementation of countermeasures would have to be accomplished by state health authorities, but no indication was given as to whether the states have the necessary authority and means of administration to accomplish the countermeasures.

We believe it is extremely important that this matter be clarified, in order to alleviate public concern over the hazards of ionizing radiation and to minimize the possibility of uncordinated and ill-advised actions being taken should certain radionuclides reach undesirable levels in the environment.

We wish, therefore, to request your views on the current status of legal authority and responsibility for invoking countermeasures or taking any other action, including any recommendations you may have in this regard.

Because we regard these matters as being of considerable importance and urgency, we would request your consideration at the earliest possible date. To that end we would like to suggest that our respective staffs should meet together on June 21 or June 22 to explore these problems further.

Your cooperation is appreciated.

Sincerely yours,

/s/ Melvin Price
Melvin Price, Chairman
Subcommittee on Research,
Development and Radiation

/s/ Chet Holifield
Chet Holifield
Chairman

UNCLASSIFIED

JOINT COMMITTEE ON ATOMIC ENERGY
Congress of the United States

January 16, 1962

Dear Mr. President:

I would like to endorse the suggestion that our Staff Director, Jim Ramey, made to Mac Bundy and Adrian Fisher to the effect that prior to any formal decision or announcement by you on the resumption of atmospheric testing a review of the extent of the fallout hazard be made by the Federal Radiation Council. At the time of any such announcement of the resumption of atmospheric testing a "white paper" should be issued which would not only explain affirmatively why we are resuming testing but also explain the extent of the fallout hazard (which would be minimal).

As you know, there is still a great deal of confusion and misinformation on the fallout hazard from weapons testing. The Joint Committee's fallout hearings in 1957 and 1959, and our hearings on the radiation standards in 1960, helped to put these hazards in proper perspective. In the latter hearings several suggestions were made that any possible significant addition of radioactivity to the environment should be reviewed in advance by the Federal Radiation Council, even though it would fall within acceptable maximum limits. This would prevent various uses from gradually absorbing the present safety factor under our existing maximum permissible dosages. Such a review would be helpful to you in your evaluation of the hazards versus the benefits of resumption of atmospheric testing.

A "white paper" written in simple terms might have some effect on the scientific community as well as the public at large. We are presently considering the desirability of holding public hearings later in this year which would update our 1959 fallout and 1960 radiation standards hearings.

Following our executive hearings on Thursday and Friday, January 18 and 19, on the status of our plans and preparations for testing, we will probably wish to communicate with you further.

Sincerely yours,

/s/ Chet Holifield
Chet Holifield
Chairman

The President
The White House

UNCLASSIFIED

CONGRESS OF THE UNITED STATES
Joint Committee on Atomic Energy

August 14, 1962

Mr. Boisfeuillet Jones
Special Assistant to the Secretary
(Health and Medical Affairs)
Department of Health, Education, and Welfare
Washington 25, D. C.

Dear Mr. Jones:

This is with further reference to our letter of June 18, 1962 to Secretary Ribicoff concerning the need for a re-evaluation of the Radiation Protection Guides established by the Federal Radiation Council and a further examination of the administrative means and legal authority for invoking countermeasures.

The urgency of this review is pointed up by the recent resumption of atmospheric nuclear testing by the Soviet Union and reports of sharp increases in radioiodine levels in Nevada and Utah from U. S. tests. The latter situation, as you know, caused local public health officials in Utah to invoke plans for the diversion of fresh milk into forms carrying lower levels of radioactivity. Recent newspaper reports state that this action by the Utah officials "came as a complete surprise to the United States Public Health Service" and was not coordinated with appropriate Federal officials.

You will recall that in our letter of June 18 .

> "We believe that it is extremely important that this matter be clarified, in order to alleviate public concern over the hazards of ionizing radiation and to minimize the possibility of uncoordinated and ill-advised actions being taken should certain radionuclides reach undesirable levels in the environment."

The recent events in Utah demonstrate the very real importance of our earlier admonition. Moreover, in view of the resumption of Soviet atmospheric testing, we believe that incidents such as this may likely occur in the future in widely-scattered portions of the United States. It is therefore important that the Federal Radiation Council proceed without delay with the consideration called for in our letter of June 18.

We do not imply that the current levels of radioactivity have reached a danger point. Indeed, we are satisfied that they are apparently within the current acceptable limits of the Radiation Protection Guides. However, we are not convinced that these Guides presently apply to fallout, nor that they should apply to fallout as presently set forth. We are heartened by the recent panel report of the National Academy of Sciences which indicates that no case of thyroid cancer ascribable to radioactive iodine has been found in man.

Thus, there is a necessity to clarify the meaning of the Radiation Protection Guides in order that they may be understood by the public and by those officials of the Government who will have the responsibility for invoking countermeasures in the event radioactivity levels reach undesirable proportions. We do not want to see another "cranberry" emergency develop as a result of Government inertia or ill-timed action. Moreover, the authority under which these public officials act must have a clear legal basis, and efficient administrative machinery must be available to assure that any action taken will be prompt and well-considered.

We hope that these matters will receive your prompt attention.

Sincerely yours,

/s/ Chet Holifield

Chet Holifield
Chairman

/s/ Melvin Price

Melvin Price, Chairman
Subcommittee on Research,
Development and Radiation

UNCLASSIFIED

FEDERAL RADIATION COUNCIL
Executive Office Building
Washington 25, D.C.

August 17, 1962

Dear Mr. Chairman:

Your letter of June 18, 1962, points out that following the recent hearings of the Subcommittee on Research, Development and Radiation of the Joint Committee on Atomic Energy, there were unresolved questions concerning the application of radiation protection standards. Following the questions are comments of the Council.

No. 1: Are the numerical values of the Radiation Protection Guides established by the Federal Radiation Council the sole or principal criteria now used in evaluating when undesirable levels of radioactive nuclides from fallout have been reached?

No. 2: If so, is this use of the present numerical values of the Guides sufficient to indicate when and what action is appropriate to protect public health?

Comments on First Two Questions: No, the Guides are not the sole criteria used in evaluating the significance of fallout.

Since there has been widespread misunderstanding concerning these Guides, it may be useful to explain how they were developed and how they are to be used.

As you know, to be prudent we assume that there is always some slight risk to health from any level of radiation exposure, however low. Hence, setting basic radiation protection guidance involves a balancing between the requirements of total health protection (which, ideally, would tolerate no exposure) and the promotion of the use of radiation and atomic energy to achieve worthwhile benefits (which may involve exposure). With this principle in mind, the Guides were originally developed for application as guidelines for the protection of radiation workers and the general public against exposures which might result during "normal peacetime operations" in connection with the industrial use of ionizing radiation. In this connection, as noted in Chairman Ribicoff's letter of June 1 to you transmitting "Comments on the Major Unresolved Questions Concerning the Federal Radiation Council" the term "normal peacetime operations" referred specifically to the peaceful applications of nuclear technology where the primary control is placed on the design and use of the source. Since the numerical values in the Guides were designed for the regulation of a continuing industry, they were of necessity set so low that the upper limit of Range II can be considered to fall well within levels of exposure acceptable for a lifetime. Furthermore, to provide the maximum margin of safety, the upper limits of Range II were related to the lowest possible level at which it was believed that nuclear industrial technology could be developed.

It is necessary to watch the build-up of exposure levels as radiation exposures occur. A one year cumulative total has been recommended for this purpose. Obviously, this one-year span is an arbitrary measure, and no special significance should be attached to the precise cumulative exposure at the end of a 365 day period. Far more relevant are the sources of the exposure, their frequency, and their likelihood of continuing.

The Guides are not intended to be a dividing line between safety and danger in actual radiation situations. Nor are they intended to set a line at which protective action should be taken or to indicate what kind of action should be taken. Some actions might in some circumstances be appropriate at levels below the Guides. Other actions might be completely inappropriate and even harmful except at levels many times above the Guide levels.

While the Guides were not specifically designed for fallout situations, they have some relevance for the assessment of fallout conditions. There is, of course, an essential difference between environmental radioactivity resulting from a long-term or permanent industrial operation and that related to intermittent production from individual weapons tests or series of weapons tests. With the former, it is predictable that introduction of radioisotopes into the environment will persist at a known rate throughout the life of the source. On the other hand, weapons tests are likely to be sporadic in nature and the radioactivity produced will rise at the time of testing and decline at varying rates for different isotopes after conclusion of a test or series of tests. While "normal peacetime operations," for which the Guides were recommended as appropriate, imply that environmental radioactivity will persist at a predetermined level throughout the human lifetime, that from fallout is likely to be extremely variable.

As applied to fallout, the Guides can be used as an indication of when there is a need for detailed evaluation of possible exposure hazards and a need to consider whether any protective action should be taken under all the relevant circumstances.

But once we are alerted to the need to consider protective action, the Guides do not tell us when to act or what to do. These judgments require careful consideration of local conditions and the impact of available health protection measures. The Council believes that individual fallout situations require individual evaluation before specific action is taken. Such an evaluation must involve a careful examination of the source and magnitude and duration of the probable exposure levels as well as a careful evaluation of the health significance of these probable exposures, and national security considerations are inevitably involved. The judgment as to when to take action and what kind of action to take to decrease exposure levels involves consideration of all of these factors. The Guides have some relevance for making this judgment, but they do not and were never intended to provide the sole basis for deciding how and when to act. It must be kept in mind that radiation exposures anywhere near

the Guides involve risks so slight that countermeasures which themselves involve any slight hazard may have a net adverse rather than favorable effect on the public well-being.

In summary then, the Guides are not intended to be a dividing line between safety and danger. We have assumed that there is some slight risk to health from any level of radiation exposure, however low, even at or below the low levels set by the Guides. At the same time we do not believe there is any risk of a major health hazard until exposure levels are many times above the Guide levels. For example, this is borne out in relation to iodine-131 by the report to the Federal Radiation Council of the National Academy of Sciences, "Pathological Effects of Thyroid Irradiation," July 1962.

No. 3: If not is the development of further or supplementary criteria needed and if so is it the responsibility of the Federal Radiation Council or the Public Health Service or others to develop and implement such criteria?

Comment: There is a continuing need for the development of guidance in this field. In accordance with Public Law 86-373, "The Council shall advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all Federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with States." The appropriate Federal agencies will develop specific modes of action in accordance with such guidance.

Your letter of June 18 mentioned another important matter left open after the hearings, that of the legal responsibility and authority for invoking countermeasures.

Within the Federal Government, authority now exists under the Federal Food, Drug, and Cosmetic Act to control the shipment of adulterated food in interstate commerce. By definition, foodstuffs containing excessive radioactivity would be adulterated.

States have the authority to control intrastate distribution or sale of adulterated foods, which would include foodstuffs containing excessive amounts of radioactivity. State food and drug laws vary widely in their scope and adequacy with respect to the problem of radioactivity in foods. The Public Health Service has the general responsibility to recommend appropriate health protection measures to States and local authorities and to the general public.

In closing, on behalf of the Council, I should like to acknowledge the Joint Committee's responsibile efforts to delineate problems relating to fallout requiring further study and clarification, and in promoting more widespread public understanding of the issues involved.

Sincerely yours,

/s/ Anthony J. Celebrezze
Anthony J. Celebrezze
Chairman

The Honorable Chet Holifield
Chairman, Joint Committee on
Atomic Energy
Congress of the United States
Washington 25, D.C.

The Honorable Melvin Price
Chairman, Subcommittee on Research,
Development and Radiation

7m 10-5-3

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Heads of Divisions and Offices, HQ
Managers of Field Offices

DATE: August 31, 1962

FROM : A. R. Luedecke, General Manager

SUBJECT: PROPOSED RADIATION SAFETY AND HEALTH STANDARDS ON FEDERAL SUPPLY CONTRACTS

OS:ISFP:RBS

Attached for your comments are copies of a proposed amendment to 41 CFR, Part 50-204*. Please submit them by September 30, 1962 to the Director, Division of Operational Safety, Headquarters.

BACKGROUND

Federal Supply Contractors subject to provisions of the Walsh-Healey Public Contracts Act (41 U.S.C. 35 & 38) are required to comply with safety and health standards in 41 CFR, Part 50-204. Since these standards largely duplicate those already imposed on the same contractors by AEC (operating under authority of the Atomic Energy Act of 1954), the AEC and the Department of Labor are working on a proposed agreement whereby the AEC would accept from the Department of Labor the latter's responsibility for administering provisions of 41 CFR, Part 50-204 insofar as these apply to designated AEC Federal Supply Contractors.

Adoption of the proposed subject amendment would extend the scope of existing safety and health standards covered by 41 CFR, Part 50-204 to include radiation safety aspects and is therefore of particular interest to AEC.

Attachment:
Proposed Amendment

* The Labor Department has verbally advised that the second from the top line of the third column on page 1 should be changed from "3 thousand electron volts" to "3 million electron volts".

Copy filed: PTC-1-Reg. Rad Protn. Reg

8-31-62

PART 50-204 - RADIATION SAFETY AND HEALTH STANDARDS

(Reprinted from the Federal Register of August 17, 1962)

Arthur J. Goldberg, Secretary

Clarence T. Lundquist, *Administrator*

DEPARTMENT OF LABOR

Division of Public Contracts

[41 CFR Part 50-204]

RADIATION SAFETY AND HEALTH STANDARDS

Safety and health standards for Federal supply contracts are expressed in 41 CFR Part 50-204. Radiation Standards are not among them because the requisite examination of the hazards involved in exposure to radiation was in progress when these regulations were promulgated. On the basis of this examination, I propose to establish the radiation standards hereinafter set forth.

Consideration has been given to the recommendations of the National Committee on Radiation Protection (National Bureau of Standards Handbooks 59 and 69) and the Radiation Guidance for Federal Agencies recommended by the Federal Radiation Council (26 F.R. 4402). The proposed standards are similar to pertinent parts of the Atomic Energy Commission's standards for protection against radiation (10 CFR Part 20). As the proposed standards are minimum standards for safe working conditions for employees engaged in the performance of Federal supply contracts, as required by section 1(c) of the Walsh-Healey Public Contracts Act, they do not include details as to generally recognized standards for safety practices or methods of determining compliance with the standards contained in these regulations. This does not detract from the desirability of complying with these other standards, nor will compliance with the standards expressed in these regulations relieve anyone from any obligation to comply with any more strict standard.

It should be noted that, to the extent these proposals may be adopted, their scope and application will be delineated by 41 CFR 50-204.1.

Now, therefore, pursuant to sections 1 and 4 of the Walsh-Healey Public Contracts Act (41 U.S.C. 35 and 38) it is hereby proposed that 41 CFR, Part 50-204 be amended by adding to the end thereof the centerhead and new sections set forth below.

Interested persons may submit written statements of data, views or arguments regarding the proposal. They should be filed with the Administrator of the Wage and Hour and Public Contracts Divisions, United States Department of Labor, Constitution Avenue and 14th Street NW., Washington 25, D.C., within 60 days after this document is published in the FEDERAL REGISTER.

The proposed regulations read as follows:

RADIATION

§ 50-204.305 Units of radiation dose.

(a) "Dose", as used in this part, is the quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body. When the regulations in this part specify a dose during a period of time, the dose means the total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time. Several different units of dose are in current use. Definitions of units as used in this part are set forth in paragraphs (b) and (c) of this section.

(b) The rad, as used in this part, is a measure of the dose of any ionizing radiation to body tissues in terms of the energy absorbed per unit mass of the tissue. One rad is the dose corresponding to the absorption of 100 ergs per gram of tissue. (One millirad (mrad) =0.001 rad.)

(c) The rem, as used in this part, is a measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of one roentgen (r) of X-rays. (One millirem (mrem) =0.001 rem.) The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions of irradiation. For the purpose of the regulations in this part, any of the following is considered to be equivalent to a dose of one rem:

(1) A dose of 1 r due to X- or gamma radiation;

(2) A dose of 1 rad due to X-, gamma, or beta radiation;

(3) A dose of 0.1 rad due to neutrons or high energy protons;

(4) A dose of 0.05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye.

§ 50-204.306 Exposure to radiation.

(a) Except as provided in paragraph (b) of this section, no employer shall permit any employee to receive in any period of one calendar quarter from any sources of radiation in the employer's possession or control, a dose in excess of the limits specified in the following table:

	Rems per calendar quarter
1. Skin, at basal layer of epidermis, of the hands, forearms, feet or ankles	18.75
2. Whole body	[1] 1.25
Gonads	1.25
Active blood-forming organs	1.25
Head and trunk	1.25
Lens of the eye	1.25
Skin of whole body	7.50

[1] For exposures of the whole body to X or gamma rays up to 3 thousand electron volts, this condition may be assumed to be met if the "air dose" does not exceed 1.25 roentgens provided the dose to the gonads does not exceed 1.25 rem. "Air dose" means that the dose is measured by an appropriate instrument in air in the region of highest dosage rate to be occupied by an individual without the presence of the human body or other absorbing and scattering material.

(b) Employees may receive doses to the whole body greater than those permitted under paragraph (a) of this section, provided:

(1) During any calendar quarter the dose to the whole body shall not exceed 3 rems; and

(2) The dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed 5(N-18) rems where "N" equals the individual's age in years at his last birthday; and

(3) The contractor maintains adequate past and current exposure records which show that the addition of such a dose will not cause the individual to exceed his age-prorated allowance.

(c) No contractor shall permit any employee who is under 18 years of age to receive in any period of one calendar quarter a dose in excess of 10 percent of the limits specified in the table in paragraph (a) of this section. (See also requirements of Hazardous Order No. 6 (29 CFR 4.57) issued pursuant to the Fair Labor Standards Act of 1938.)

§ 50-204.307 Exposure to airborne radioactive material.

No employer shall permit any employee to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in the following table, nor shall an employer permit any employee who is under 18 years of age to be exposed to airborne radioactive material in an average concentration in excess of 10 percent of such limits. The limits given are for exposure to the concentrations specified for 40 hours in any workweek of 7 consecutive days. In any such period where the number of hours of exposure is less than 40, the limits specified in the table may be increased proportionately. In any such period where the number of hours of exposure is greater than 40, the limits specified in the table shall be decreased proportionately.

CONCENTRATIONS IN AIR ABOVE NATURAL BACKGROUND

Element (atomic number)	Isotope [1]		Microcuries per milliliter (μc/ml)
Antimony (51)	Sb 122	S	2×10^{-7}
	Sb 124	I	1×10^{-7}
	Sb 125	S	2×10^{-7}
		I	2×10^{-7}
Argon (18)	A37	Sub [2]	5×10^{-3}
	A41	Sub	6×10^{-8}
Bismuth (83)	Bi 206	S	2×10^{-7}
		I	1×10^{-7}
	Bi 207	S	2×10^{-7}
		I	1×10^{-7}
	Bi 210	S	6×10^{-9}
		I	6×10^{-7}
	Bi 212	S	1×10^{-7}
		I	2×10^{-7}
Calcium (20)	Ca 45	S	3×10^{-7}
		I	1×10^{-7}
	Ca 47	S	2×10^{-7}
		I	2×10^{-7}
Carbon (6)	C 14	S	4×10^{-6}
	(CO$_2$)	Sub	5×10^{-5}
Cadmium (48)	Cd 109	S	1×10^{-7}
		I	3×10^{-7}
	Cd 115m	S	4×10^{-7}
		I	6×10^{-7}
	Cd 115	S	4×10^{-7}
		I	1×10^{-6}
	Cd 117m	S	5×10^{-7}
		I	9×10^{-7}
	Cd 117	S	4×10^{-7}
		I	2×10^{-6}
	Cd 127	S	6×10^{-7}
		I	1×10^{-6}
Cobalt (27)	Co 57	S	3×10^{-6}
		I	2×10^{-6}
	Co 58m	S	2×10^{-6}
		I	9×10^{-6}
	Co 58	S	3×10^{-7}
		I	5×10^{-7}
	Co 60	S	3×10^{-7}
		I	9×10^{-8}
Gold (79)	Au 194	S	1×10^{-6}
		I	6×10^{-7}
	Au 198	S	3×10^{-7}
		I	2×10^{-7}
	Au 199	S	1×10^{-6}
		I	8×10^{-7}
Hydrogen (1)	H3	S	5×10^{-6}
		Sub	2×10^{-5}
Iodine (53)	I 126	S	3×10^{-9}
		I	3×10^{-8}
	I 129	S	2×10^{-9}
		I	7×10^{-8}
	I 131	S	9×10^{-8}
		I	8×10^{-8}
	I 132	S	2×10^{-7}
		I	9×10^{-7}
	I 133	S	3×10^{-7}
		I	2×10^{-7}
	I 134	S	6×10^{-7}
		I	3×10^{-7}
	I 135	S	1×10^{-7}
		I	4×10^{-7}
Iridium (77)	Ir 190	S	1×10^{-7}
		I	4×10^{-7}
	Ir 192	S	1×10^{-7}
		I	2×10^{-7}
	Ir 194	S	2×10^{-7}
		I	7×10^{-7}
Iron (26)	Fe 55	S	9×10^{-7}
		I	1×10^{-6}
	Fe 59	S	1×10^{-7}
		I	5×10^{-8}
Krypton [3] (36)	Kr 85m	Sub	6×10^{-6}
	Kr 85	Sub	1×10^{-5}
	Kr 87	Sub	1×10^{-7}
Lead (82)	Pb 203	S	3×10^{-7}
		I	2×10^{-7}
	Pb 210	S	1×10^{-10}
		I	2×10^{-10}
	Pb 212	S	2×10^{-7}
		I	2×10^{-7}
Neptunium (93)	Np 237	S	4×10^{-13}
		I	1×10^{-12}
	Np 239	S	6×10^{-7}
		I	7×10^{-7}
Phosphorus (15)	P 32	S	7×10^{-7}
		I	6×10^{-7}
Polonium (84)	Po 208	S	2×10^{-10}
		I	2×10^{-10}
	Po 209	S	2×10^{-10}
		I	4×10^{-10}
	Po 210	S	2×10^{-10}
		I	4×10^{-10}
	Po 211	S	6×10^{-10}
		I	4×10^{-9}
	Po 212	S	2×10^{-10}
		I	4×10^{-10}
Polonium (84)	Po 210	S	5×10^{-10}
		I	2×10^{-9}
Radium (88)	Ra 223	S	2×10^{-9}
		I	2×10^{-9}
	Ra 224	S	6×10^{-9}
		I	7×10^{-9}
	Ra 226	S	3×10^{-11}
		I	6×10^{-11}
	Ra 228	S	7×10^{-11}
		I	4×10^{-10}

See footnotes at end of table.

CONCENTRATIONS IN AIR ABOVE NATURAL BACKGROUND—Continued

Element (atomic number)	Isotope [1]		Microcuries per milliliter (μc/ml)
Radon (86)	Rn 220	S	3×10^{-6}
		I	
	Rn 222	S	4×10^{-7}
Strontium (38)	Sr 85m	S	4×10^{-6}
		I	3×10^{-6}
	Sr 85	S	2×10^{-7}
		I	1×10^{-7}
	Sr 89	S	3×10^{-8}
		I	4×10^{-8}
Thallium (81)	Tl 200	S	3×10^{-7}
		I	1×10^{-6}
	Tl 201	S	2×10^{-6}
		I	8×10^{-7}
	Tl 202	S	6×10^{-7}
		I	2×10^{-6}
	Tl 204	S	6×10^{-7}
		I	3×10^{-6}
Thorium (90)	Th 228	S	9×10^{-13}
		I	5×10^{-12}
	Th 230	S	2×10^{-12}
		I	10^{-11}
	Th 232	S	3×10^{-13}
		I	3×10^{-12}
	Th natural	S	5×10^{-13}
		I	5×10^{-12}
	Th 234	S	6×10^{-7}
		I	5×10^{-7}
Uranium (92)	U 230	S	3×10^{-12}
		I	1×10^{-11}
	U 232	S	1×10^{-12}
		I	8×10^{-12}
	U 233	S	5×10^{-12}
		I	1×10^{-11}
	U 234	S	6×10^{-12}
		I	1×10^{-11}
	U 235	S	5×10^{-12}
		I	1×10^{-11}
	U 236	S	6×10^{-12}
		I	1×10^{-11}
	U 238	S	7×10^{-12}
		I	1×10^{-11}
	U-natural	S	7×10^{-12}
		I	6×10^{-11}
Xenon (54)	Xe 131m	Sub	3×10^{-4}
	Xe 133	Sub	1×10^{-4}
	Xe 135	Sub	4×10^{-4}

[1] Soluble (S); Insoluble (I).

[2] "Sub" means that values given are for submersion in an infinite cloud of gaseous material.

NOTE: In any case where there is a mixture in air of more than one radionuclide, the limiting values for purposes of the above table should be determined as follows:

1. If the identity and concentration of each radionuclide in the mixture are known, the limiting values should be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit otherwise established in the above table for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

EXAMPLE: If radionuclides A, B, and C are present in concentrations C_A, C_B, and C_C, and if the applicable maximum permissible concentrations are MPC_A, and MPC_B, and MPC_C respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{MPC_A}+\frac{C_B}{MPC_B}+\frac{C_C}{MPC_C}\leq 1$$

2. If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of the above table shall be: 1×10^{-12}

3. If the conditions specified below are met, the corresponding values specified below may be used in lieu of that specified in paragraph 2 above.

Element (atomic number) and isotope	Air (μc/ml)
If it is known that alpha-emitters and Sr 90, I 129, Pb 210, Ac 227, Ra 228, Pa 230, Pu 242 and Bk 249 are not present.	3×10^{-12}
If it is known that alpha-emitters and Pb 210, Ac 227, Ra 226, and Pu 241 are not present.	2×10^{-11}
If it is known that alpha-emitters and Ac 227 are not present.	1×10^{-11}
If it is known that Ac 227, Th 230, Pa 231, Pu 239, Pu 239, Pu 240, Pu 242, and Cf 249 are not present.	3×10^{-11}
If Pa 231, Pu 239, Pu 240, Pu 242 and Cf 249 are not present.	2×10^{-10}

4. If the mixture or radionuclides consists of uranium and its daughter products in ore dust prior to chemical processing of the uranium ore, the values specified below may be used in lieu of those determined in accordance with paragraph 1 above or those specified in paragraphs 2 and 3 above.

1×10^{-10} μc/ml gross alpha activity; or 2.8×10^{-3} μc/ml natural uranium; or 75 micrograms natural uranium per cubic meter of air.

§ 50-204.308 Precautionary procedures.

(a) Every employer shall supply appropriate personnel monitoring equipment, such as film, badges, pocket chambers, pocket dosimeters, or film rings, to, and require the use of such equipment by:

(1) Each individual who enters an area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25 percent of the applicable value specified in paragraph (a) of § 50-204.306; and

(2) Each individual under 18 years of age who enters an area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 5 percent of the applicable value specified in paragraph (a) of § 50-204.306.

(b) Every employer shall make such surveys as may be necessary for him to comply with the regulations in this part. "Survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present.

§ 50-204.309 Records.

(a) Every employer shall maintain records of the radiation exposure of all individuals for whom personnel monitoring is required under § 50-204.308(a) and advise each of his employees of his individual exposure on request.

(b) Every employer shall maintain records in the same units used in the table in § 50-204.307 showing the results of surveys required by § 50-204.308(b).

§ 50-204.310 Application for variations.

(a) In accordance with the policy expressed in the Federal Radiation Council's memorandum concerning radiation protection guidance for Federal agencies (25 F.R. 4402), the Administrator of the Wage and Hour and Public Contracts Divisions may from time to time grant permission to employers to vary from the limitations contained in §§ 50-204.306 and 50-204.307 when the extent of variation is clearly specified and it is demonstrated to his satisfaction that (1) such variation is necessary to obtain a beneficial use of radiation or atomic energy; (2) such benefit is of sufficient value to warrant the variation, (3) employees will not be exposed to an undue hazard, and (4) appropriate action will be taken to protect the health and safety of such employees.

(b) Applications for such variations should be filed with the Administrator of the Wage and Hour and Public Contracts Divisions, United States Department of Labor, 14th Street and Constitution Avenue NW., Washington 25, D.C.

(Secs. 1 and 4, 49 Stat. 2036 and 2038; 41 U.S.C. 35 and 38)

Signed at Washington, D.C., this 10th day of August 1962.

ARTHUR J. GOLDBERG,
Secretary of Labor.

[F.R. Doc. 62-8202; Filed, Aug. 16, 1962; 8:45 a.m.]

MH.S.30

Great Lakes Petroleum Services

A DIVISION OF GREAT LAKES CARBON CORPORATION

EXECUTIVE OFFICES: 18 EAST 48th STREET, NEW YORK 17, N.Y.

PLEASE ADDRESS REPLY TO
P.O. Box 2050
Houston 1, Texas

August 31, 1962

Dr. Seaborg, Commissioner
U.S. Atomic Energy Commission
Washington 25, D.C.

Dear Dr. Seaborg:

I recently received a visit from Dr. Donald E. Barber of the University of Michigan who is doing a study of occupational radiation exposures. We discussed radiation exposure and the methods we use at this company involving radioactive materials. He outlined his concern with the increasingly stringent regulations placed on isotope users by the U.S. Atomic Energy Commission. I hope that the following expression of my opinion on the complexity of the licensing and regulation will be of interest to you.

This company operates in four states with seven mobile service units, equipped to use radioactive sources in a variety of techniques that can be generally classified as oil well logging. In this application the sealed sources contained in a measuring instrument of special design are lowered into an oil well for the purpose of evaluating subsurface formations. We have approximately 10 men qualified to handle sealed radioactive sources. The source most used is plutonium beryllium with an activity of 5 curies. 150 millicurie Cobalt 60 and Cesium 137 sources are also used. Our personnel radiation exposure records indicate that none of our operators received radiation doses in excess of .5 rem per calendar quarter. I understand from conversations with other members of our industry that exposures of this level are typical for all operators of radioactive well logging equipment.

I have been associated with well logging operations since 1952, and have observed very little change in the procedures involved. The number and quality of experienced operators has increased over the years as has our own knowledge of handling high intensity radioactive sources. However, we find that the time spent in satisfying the Atomic Energy Commission of our ability to carry on these well established procedures with safety to our personnel and the public has increased considerably during the past 10 years. We are currently awaiting renewal of our special Nuclear Material License originally designated as SNM-270. The Commission requested additional information which was not included in the application for the original license. The total amount of time required to compile this requested information in a form suitable for presentation to the Commission exceeded 40 hours. I believe that some of the

Continued - - -

22-15-8

information requested, in view of our history of negligible radiation exposure, was completely unnecessary.

An example of what I consider to be a superfluous question is as follows:

> "Please provide a more detailed description of your method for determining the dose rate from the neutron sources at field operating positions using the Landsverk L-49 dosimeter. These measurements should be confirmed by air-distance calculations, showing the relative distances and the calculated neutron fluxes. At what frequency are the dosimeters calibrated?"

Prior to posing this question, the Commission had been provided with sketches of the operating procedure, showing the location of the operator relative to the source and logging instrument during the source installation procedure. The dose rates measured with the Landsverk dosimeter had also been provided. I fail to find any useful purpose in going through a neutron dose rate calculation under these circumstances. For the source in question the dose rate in air at one meter is approximately 10 millirem per hour. Mr. R. L. Layfield of the division of licensing and regulation acknowledged in a phone conversation that he was aware of the relatively low exposure rates due to this source under the conditions of use. However, he subsequently placed before us the above quoted question and requested a reply.

There are no doubt radioisotope applications which require extreme care to avoid over-exposure as the result of changing source strength and conditions of use. However, in oil well logging it has been proven by long experience, without accident, that source strength, procedures and exposure rates are invariant. Under these conditions I feel sure you will agree that less detailed information is required to adequately establish an operator's competency in safe-handling of the material.

Many of the smaller companies engaged in well logging are frank to admit that they will under all possible circumstances avoid the use of Atomic Energy Commission licensed material because they wish to avoid the "red tape" involved in obtaining and maintaining the license. Unfortunately, some of these companies, while avoiding the trouble of obtaining an AEC license, also overlook their responsibilities in the safe-handling of unlicensed sources such as radium. It is possible that the overly stringent requirements of the Commission may be contributing to a safety hazard by forcing some users to design their equipment around radium sources for which there are virtually no controls.

Supervision of the use of radioactive materials by a Government Agency is unquestionable essential. On more than one occasion in the past

Continued - -.-

our own Isotope Program has been significantly improved by following the suggestions of Commission inspectors. However, I believe the optimum level of regulation has been exceeded. For a company, such as ours, an even more troublesome situation may arise in the future as the different states acquire responsibility for regulating usage of radioactive materials.

I hope that you are somewhat sympathetic to this point of view and will find my comments of some small help.

Yours very truly,

GREAT LAKES PETROLEUM SERVICES

Glenn E. Fryer
Chief Electronics Engineer

GEF:kh

FEDERAL RADIATION COUNCIL
Executive Office Building
Washington 25, D. C.

AUG 29 1962

Dear Messrs. Chairmen:

In reply to your letter of August 16 to Mr. Boisfeuillet Jones concerning the Radiation Protection Guides promulgated by the Federal Radiation Council, I believe that the letter I sent to you on August 17 sets forth the Council's position and discusses the questions which the Committee had previously raised in some further detail.

The Council recognizes that premature action has been taken in some areas to reduce the intake of iodine-131, which action the Council would not have recommended under its interpretation of the Guides. The Council would like to emphasize this point by reiteration of its position outlined in its letter of August 17 to you. There, we stated that "... there has been widespread misunderstanding concerning these Guides ...". We went on to point out that they "... are not intended to set a line at which protective action should be taken or to indicate what kind of action should be taken."

The Council is continuing its review of the overall radiation protection problem, including fallout. To assure the best possible scientific advice and its presentation in such form as to be easily and thoroughly understood, representatives of the Council are meeting with non-Federal scientists, including representatives of the National Academy of Sciences and of the National Committee on Radiation Protection and Measurements. We believe that these efforts, in the form of special studies, will do much to clarify the issues and provide additional guidance for protective action.

The Council will, of course, continue to keep you apprised of significant developments.

Sincerely yours,

Anthony J. Celebrezze
Chairman

The Honorable Chet Holifield
Chairman, Joint Committee on Atomic Energy
Congress of the United States
Washington 25, D. C.

The Honorable Melvin Price
Chairman, Subcommittee on Research,
Development and Radiation

Attachment 3

OFFICIAL USE ONLY

OPTIONAL FORM NO. 10
5010-104
UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: August 23, 1962
(Revised August 27, 1962)

FROM : Harold D. Anamosa, Acting Secretary

SUBJECT: PROPOSED LETTER TO SENATOR BENNETT

SYMBOL: SECY:JCH

1. At Information Meeting 188 on August 21, 1962, Commissioner Haworth requested the proposed letter to Senator Wallace F. Bennett of Utah be redrafted to more accurately explain the Federal Radiation Council's guides and their meaning.

2. We were subsequently informed that the Division of Operational Safety has rewritten the letter and submitted it to the General Manager on August 23, 1962.

cc:
Chairman
Commissioner Haworth
General Manager
Deputy General Manager
Director of Regulation
Deputy Director of Regulation
Assistant General Manager
Asst. Gen. Mgr. for Operations
Director, Radiation Protection Standards
Director, Operational Safety
General Counsel

OFFICIAL USE ONLY

MNS-3

8

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON 25, D. C.

27 August 1962

Dear Dr. Seaborg:

Attached is a draft of the statement which has been prepared for use in Mr. Gilpatric's appearance before the JCAE Subcommittee on Research, Development and Radiation on 5 September 1962. Mr. Gilpatric has asked that I send a copy to you.

Sincerely,

William D Houser

WILLIAM D. HOUSER
Captain, USN
Military Assistant

Honorable Glenn T. Seaborg
Chairman
Atomic Energy Commission
Washington 25, D. C.

8-27-62

August 24, 1962

Draft of Statement for Mr. Gilpatric before JCAE
on September 5, 1962

Mr. Price, Gentlemen:

In considering the management and coordination of nuclear power developments for use in space, we have several current projects and considerable past experience to guide us. As you know, the NOVER nuclear rocket project was originally a joint Air Force - AEC program until the DOD portion was transferred to NASA. At present, SNAP-2 (a 2 Kw turboelectric unit) and SNAP-10A, (a 500 watt thermoelectric unit) - both reactor powered - are being developed by the AEC for the Air Force. SNAP-3, a small radioactive isotope-powered, thermoelectric unit, is being developed for the Navy. Two preliminary models of SNAP-3 are now operating satisfactorily in navigation satellites, and a somewhat larger unit is under development for the same purpose. There is also the SNAPSHOT program, in which experimental and test models of SNAP-10A and SNAP-2 will be test flown in Air Force satellites.

DOD - AEC coordination of these SNAP projects and the SNAPSHOT program is handled under the General Agreement on Aerospace Nuclear Power dated 8 September 1961. This agreement provides that the AEC shall have complete responsibility for developing both the nuclear energy source and conversion equipment when the device is designed as an integral unit, and that installing the unit in the flight vehicles and conducting flight tests shall be the responsibility of the DOD. It also provides that, in future developments, special arrangements may be worked out for a different division of responsibility if there is not an integral design, or if special design features must be incorporated in the carrier vehicle. In either case, the AEC assumes

responsibility for the safety and performance of the nuclear power sources through all phases of development and flight testing.

If special agreements are made for specific applications, "These separate agreements will cover specific organization procedures and agency responsibilities, including funding, facilities support, and the detailing of Department of Defense or Atomic Energy Commission personnel to organizations with research, development or test responsibilities".

The General Agreement, itself, provides that DOD personnel, selected by the Department and approved by the Commission, will be stationed with the AEC for duty on aerospace nuclear power projects as members of the AEC headquarters or field staffs, and that normal administrative support and clerical assistance will be furnished by the AEC. This has been done, and the present SNAP developments covered by specific DOD requirements are being handled by the joint group.

To further delineate and specify the respective responsibilities of the two agencies in the SNAPSHOT and similar space power unit testing programs, a supplementary agreement has just been worked out by the staffs of the two agencies. This agreement was forwarded to Dr. Seaborg on August 14 by the Chairman of the Military Liaison Committee, who signed it on behalf of the DOD.

The development of higher power units, such as the Air Force SPUR concept and the AEC SNAP-50 concept, to provide space power in the 100 kilowatt to 1 megawatt range, is now being actively studied by the Commission and the Air Force to determine what, if any, special agreement may be required. The Air Force certainly has a potential, but at

present, non-specific requirement for electrical energy in this power range. Possible uses are in radar surveillance and mapping, high powered communications and electronic countermeasures, or electrical propulsion for orbital station keeping or maneuvering. NASA is also interested in space power units of this size, as well as in the multi-megawatt range for deep space exploration.

It is my belief that because of the similar interests of the two user agencies in the space power field, and the unique capabilities and responsibilities of the AEC in the nuclear area, the relationships of NASA and the DOD with the AEC in such developments should be as nearly identical as possible. I further suggest that, at least until such time as NASA or the DOD has a specific requirement for a particular space power unit, the research and development on all components should be the prime responsibility of the AEC, and that the bulk of the funding should be provided by the Commission.

Several of the present Assistant Directors and Branch Chiefs in the AEC Division of Reactor Development are military officers. It would seem appropriate that the head of the AEC office responsible for large space power units should be an Air Force officer and that he should also have responsibility for the direct supporting work in the Air Force, possibly through another Air Force officer who would be one of his deputies. Likewise, he should have a NASA deputy who would follow the direct supporting work in NASA. With such an arrangement, I believe the obviously difficult task of mating the power unit with the space vehicle provided by the user agency could be accomplished with minimum trouble and confusion.

It seems to me particularly important that most of the funds should be allocated to a single agency, especially in the early stages of component research and development, where it is recognized by all concerned that substantial advances will be required in the state of the art in high temperature materials, metal-lubricated bearings, metallic vapor turbines, electrical generators, heat exchangers, and boilers and condensers for use in a zero gravity environment - as well as in high temperature, long lived reactors. This will ensure an orderly and well balanced program over the ten or twelve years that will probably be required for such a development, and should avoid many of the difficulties that plagued the Aircraft Nuclear Propulsion project.

In some respects, the development of high power, light weight nuclear space power units closely parallels the ANP development. The latter involved radical advances in the state of the art; did not have a specifically defined user requirement, and hence had to compete in each budget cycle with more pressing immediate requirements; and because of the many and fascinating technical problems, it tended to generate strong proponents and opponents in the various technical areas. All of these factors will appear in the space power program and its over-all cost will be comparable to ANP. If the project could be put under a single, competent, consolidated management group many of these difficulties could be solved before they become serious.

MH+P 3-Radiation

6

AUG 24 1962

Dear Senator Bennett:

This is in reply to your letter of August 6, 1962, concerning a letter from Mr. Gene W. Miller wherein he raises some questions on radioactive fallout in milk in Utah.

The Federal Radiation Council's Guides were developed primarily for use by a continuing industry in restricting releases of its radioactive effluents to the general environment outside of its controlled areas. Obviously, Guides recommended for this purpose are substantially lower than those associated with a hazard to the health of the public. Also, account must be taken of the difference between the continuing industrial release of radioactivity envisioned by the Guides and the sporadic, widely-varying release of radioactivity from testing.

Furthermore, these Guides were of necessity set so low that they can be considered to fall well within levels of exposures set for a lifetime. Since the real problem of concern is the lifetime dose, it is necessary to watch the build-up of exposure levels as radiation exposures occur. A one-year cumulative total has been recommended for this purpose. Obviously, this one-year span is an arbitrary measure, and no special significance should be attached to the precise cumulative exposure at the end of a 365-day period. Far more relevant are the sources of the exposure, their frequency, and their likelihood of continuing.

Specifically, the Federal Radiation Council's Radiation Protection Guide for radiation doses to the thyroids of individuals in the general population is 1.5 rem per year. (The corresponding value of permissible doses for the thyroids of adults in the atomic energy industry is 30 rem per year.) This criterion of 1.5 rem per year is based on the most sensitive segment of the population, i.e., children, and corresponds to an annual intake of 109,500 micromicrocuries of iodine-131. Recognizing that it would not be physically possible to monitor all persons in the

Info Mtg 1962

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country, the Federal Radiation Council stipulated that the technique may be used of monitoring suitable samples of the whole population, in which case the average has been set at 36, 500 micromicrocuries of iodine-131 per year (a factor of 1/3) since a spread in the data above and below the average would be expected.

As already noted, the criteria of 1.5 rem per year to the thyroids of individuals and 0.5 rem per year for a suitable sample of the whole population are lifetime Guides. Therefore, there should not be undue alarm if the values were exceeded in some years, especially for such short-lived radionuclides as iodine-131, with a half-life of only eight days. Actually, the adult thyroid receives a radiation dose of only about one-tenth that of the child, even if he ingests the same amount of iodine-131 (because of the increased size of the adult thyroid).

The average value of 36, 500 micromicrocuries per yearly intake is for children, based on the assumption that a young child drinks one liter of milk per day. As a child grows older, he might drink more than this amount but his thyroid gland would increase in size. An adult would have to drink several liters of milk per day to receive the same exposure to his thyroid as would a young child with a smaller thyroid drinking one liter of the same milk.

The above radiation doses may be placed in perspective quickly by a summary statement made in Pathological Effects of Thyroid Irradiation, A Report of a Panel of Experts from the Committees on Biological Effects of Atomic Radiation: National Academy of Sciences-National Research Council, July, 1962, ". . . There is no evidence at hand, except for one doubtful case in a child, that any of the treatments for hyperthyroidism has produced a thyroid cancer, although doses have ranged from a few thousand rads upward. . . " (a few thousand rads roughly corresponds to 100, 000, 000 micromicrocuries).

The amount (activity) of iodine-131 in fallout debris is very much greater than strontium-90 for the first weeks following a nuclear detonation. Thus, relatively large amounts of iodine-131 may be found when the contribution of strontium-90 is quite small. The latest measurements in milk (May, 1962) for the Salt Lake City

area showed only 7 strontium units, while the national average was 14 strontium units. The relatively fresh fallout that occurred this July in the Salt Lake City area should contribute only a small increment to this strontium value.

As you know, precautionary measures were taken by the State and City health officials in the Salt Lake City area consisting of placing some milk producers on dry feed and diverting others to manufactured milk products. Such actions did represent awareness and alertness to these problems, even though the situation was far from hazardous. The technical discussions that followed in Salt Lake City on August 7 and 8, 1962, where the Commission was privileged to be represented, helped clarify the data and their interpretations. As the Chairman of the State Board of Health stated, in effect, at a public meeting on August 8th, there had been no health hazard, but that it had appeared wise to take precautionary measures until the situation could be studied more thoroughly. To this end, the Chairman of the State Board of Health proposed to form a state radiation safety committee, not only for fallout but for all sources of man-made radiations such as X-ray machines.

If I can be of further assistance, please let me know.

Sincerely yours,

(SIGNED) ROBERT E. WILSON

Robert E. Wilson
Acting Chairman

The Honorable Wallace F. Bennett
United States Senate

bcc: Chairman (2)
GM (1)
AGMO (1)
Cong. L. (2)
Admin. Of., OS (1)

Retyped in Ofc of the Chairman

UNCLASSIFIED

August 10, 1962

AEC 604/67

COPY NO. 67

AEC 604/67

ATOMIC ENERGY COMMISSION

AEC ANNUAL REPORTING REQUIREMENTS TO FEDERAL RADIATION COUNCIL

Note by the Acting Secretary

The Director, Office of Radiation Standards, has requested that the attached letter to the Honorable Anthony J. Celebrezze, Chairman, Federal Radiation Council, be circulated for the information of the Commission.

Harold D. Anamosa

Acting Secretary

DISTRIBUTION	COPY NO.	DISTRIBUTION	COPY NO.
Secretary	1	Public Information	31 - 32
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Dir. of Regulation	9	Military Application	36
Deputy Dir. of Regulation	10	Operational Safety	37
Deputy Gen. Mgr.	11	Operations Analysis	38
Asst. Gen. Mgr.	12	Peaceful Nuclear Expl.	39
Asst. GM-Plans & Prod.	13	Production	40 - 43
Asst. GM Operations	14	Radiation Standards	44 - 49
Asst. Gen. Mgr. R&D	15	Raw Materials	50 - 51
Asst. Gen. Mgr. Adm.	16	Reactor Development	52 - 60
General Counsel	17 - 21	Manager, Naval Reactors	61
Biology & Medicine	22	Research	62 - 63
Compliance	23 - 29	D. C. Office	64 - 66
Congr. Liaison	30	Secretariat	67 - 72

8.10.62

UNCLASSIFIED

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C.

August 6, 1962

Dear Mr. Celebrezze:

This report is in response to the Federal Radiation Council Memorandum for the President, dated September 2, 1960, requesting each Federal Agency to report by August 1 of each year as to the status of any operating criteria or regulations revised, adopted, or promulgated during the previous year under the Radiation Protection Guidance for Federal Agencies promulgated by the President, and as to any such criteria or regulations involving levels in excess of the FRC guidance. The Atomic Energy Commission has made no such revisions in its regulations during the past year.

Since our report of last year, the Federal Radiation Council has issued, in a Memorandum approved by the President, September 20, 1961, and in its Report No. 2, guidance "designed to limit exposure of members of population groups to radiation from radioactive materials deposited in the body as a result of their occurrence in the environment." In addition to recommendations covering general principles, this guidance provides specific recommendations for radium-226, iodine-131, strontium-90, and strontium-89 which differ in at least two respects from those of the International Commission on Radiological Protection and Measurements and the National Committee on Radiation Protection. Quantitative guidance levels are expressed in terms of rates of intake rather than in terms of concentrations in water and air, and the levels given for iodine-131 and, to a lesser extent, for strontium-89 are more restrictive.

The staff of the Commission has given considerable thought to the problems involved in the formulation of regulations and operating criteria which might best meet the intent of the FRC guidance. However, the guidance given by the Council is not directly translatable into operational and regulatory limits. The guidance provided by the FRC is in terms of total intake by the members of "suitable samples" of affected population groups. The criteria used by the AEC in operating its own facilities have been in terms of concentrations in the environs. Legal considerations in the regulatory control of the release of radioactive materials to the environment by users licensed by the AEC has led us to specify concentrations (and, in some cases, quantities) in which the materials are released.

A preliminary review by our staff of the quantities and conditions of handling of iodine-131 and strontium-89 by AEC licensees indicated no immediate need for the revision of existing regulations. Environmental monitoring in the vicinities of AEC-owned facilities, where in some cases far greater quantities are involved, indicate that average concentrations of iodine-131 and strontium-89 are well within the guidance provided by the Federal Radiation Council. The Nevada Test Site is a possible exception which is discussed below.

The above considerations will be reflected in the next revisions of the Commission's regulations and operating directives dealing with this subject. Copies of these will be furnished the Council when issued.

In the case of the Nevada Test Site, although levels of iodine-131 averaged over the past 12 months are within the guidance provided by the FRC, continuing levels in milk may result in a 12-consecutive-month intake above that recommended by the FRC for normal peacetime operations. Essentially all of this is from nuclear weapons testing, partly from U.S. tests at the Nevada Test Site and in the Pacific and partly from the U.S.S.R. tests. It is the understanding of the Commission that the Federal Radiation Council is currently reviewing the applicability of their guides to other than "normal peacetime operations," such as nuclear weapons tests.

In connection with the weapons tests held this year at the Nevada Test Site, the Commission has continued the use of the following offsite exposure criteria, adopted in 1955:

> "The basic guide for radiation exposure to offsite populations from weapons tests at the Nevada Test Site is 3.9 roentgens estimated dose per year. Every reasonable effort should be made to keep the radiation exposures as low as possible, but for planning purposes, if unanticipated yet credible circumstances could result in estimated doses in excess of 3.9 roentgens per year, then the detonations should be postponed until more favorable conditions prevail. Any past radiation exposures, from either nuclear weapons tests or other activities at the Nevada Test Site, would be included in estimating the total potential exposure from any given detonation."

The purpose of this guide is to assist the Nevada Test Site Organization in its determination to fire, or not, a nuclear device under a particular set of weather conditions. Even with the best predictions of potential radioactive contamination, there is necessarily some degree of uncertainty as to the results. They are instructed to use rather pessimistic but credible assumptions in estimating the potential exposure to populations offsite. If this estimate exceeds 3.9 roentgens for a calendar year, then the detonation is postponed until more favorable conditions prevail. Every feasible effort will, of course, be made to keep radiation exposures to a minimum. Great care will be exercised to minimize the possibility that any given community might approach 3.9 roentgens in any year through a repetition of fallout events, or that relatively large population areas, such as Las Vegas, would be in the predicted sector of fallout.

Sincerely yours,

/s/

Glenn T. Seaborg
Chairman

Honorable Anthony J. Celebrezze
Chairman
Federal Radiation Council
Room 597 Executive Office Building
Washington 25, D. C.

AUG 8 1962

Dear Mr. Holifield:

In your letter of June 25, 1962, you invited us to comment on questions raised in your letter of June 18, 1962 to Secretary Ribicoff as Chairman of the Federal Radiation Council.

We agree that these questions should be resolved as rapidly as feasible. Copies of your letter to Secretary Ribicoff were circulated to members of the Council on June 22, 1962, and the subject of applicability of Federal Radiation Council guides to fallout from weapons testing was discussed at a meeting of the Council on June 27, 1962. However, because of the many conflicting considerations involved and the wide range of views stemming in part from the varied responsibilities of the members of the Council, this meeting afforded opportunity for little more than an exchange of views between members of the Council.

The manner in which some of these questions relate to current activities and policies of the Federal government and to problems of public and international relations may make it all the more difficult to completely resolve these questions in the immediate future. It is perhaps premature for me, as a member of the Council, unilaterally to express a position on the subject at this time. I cannot be certain to what extent my views and those of the Commission may be tempered by further discussion with other members of the Council. However, the views of the Commission, as well as those of other members of the Council, are being considered in the preparation of the Council's reply to your letter.

Sincerely yours,

D C OFFICE
OFFICE OF THE SECRETARY
DOCUMENT CONTROL STATION

(Signed) Glenn T. Seaborg

Chairman

Honorable Chet Holifield
Chairman, Joint Committee on Atomic Energy
Congress of the United States

Rewritten ORS
8/7/62

ORS:DIR

FWestern:mf
8/7/62

Distribution:
Chairman (2)
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Secretariat (1)
OGC (1) DOS (1)
DRM (1) DPI (1) Cong Liais(2)

FORM AEC-204
(8-47)

DATE:

INDEX: MH&S-3-Radiation

[redacted]

TO:

FROM:

SUMMARY: AEC 811/106: PRELIMINARY HEALTH AND SAFETY REPORT - PROJECT SEDAN. Memo from Division of Operational Safety with attached data which outlines the health and safety information relative to the Sedan event and are subject to revision upon receipt of the final report from the Nevada Operations Office. A separate report re the impact of the Sedan event upon milk supplies is being peppared.

FILED:

INDEXER: MR&A-9-1-Non-Military Uses of Atomic Weapons

REMARKS: date of paper: 8-2-62
date of memo: 7-25-62

U. S. ATOMIC ENERGY COMMISSION

CORRESPONDENCE REFERENCE FORM

☆ U. S. GOVERNMENT PRINTING OFFICE—1955—362666

PM-5-3

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8/1/62
OUO

2. Iodine Content in Utah Milk

Mr. Ink reported that the iodine content in milk in the State of Utah has increased. He stated that the radioactivity is within acceptable limits, and commented that Senator Bennett may be in touch with the Commission to ask whether further tests will contribute to the problem.

8-1-62

[redacted]

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: July 20, 1962

FROM : W. B. McCool, Secretary

SUBJECT: PROPOSED PRESS RELEASE ON THE IODINE PROBLEM

SYMBOL: SECY:JCH

1. At Information Meeting 176 on July 13, 1962, the Commission discussed a proposed press announcement re iodine exposure and requested appropriate revisions for their review at an early date.

2. At Information Meeting 177 on July 18, 1962, the Commission approved, subject to further review, a proposed statement re iodine 131 in the Public Health Service "Radiological Health Data" publication.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Asst. to the Gen. Mgr.
Director, Public Information

CONFIRMED TO BE UNCLASSIFIED
AUTHORITY: DOE - DP/80
BY: J Hoppe DATE: 12/11/85
by: JB Hahn 2/24/86

[redacted]

7-26-62

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OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: July 19, 1962

FROM : W. B. McCool, Secretary

SUBJECT: ADVICE TO FEDERAL RADIATION COUNCIL RE CRITERIA FOR OFF-SITE RADIATION LEVELS AT NTS

SYMBOL: SECY:JCH

1. At Information Meeting 176 on July 13, 1962, the Commissioners agreed that the AEC should advise the Federal Radiation Council on criteria for off-site radiation levels at the Nevada Test Site in the forthcoming annual report to the FRC rather than by separate letter.

2. The Office of the Secretary was subsequently informed by the Office of Radiation Standards that this matter would be given attention in the annual report to the FRC.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Asst. to the Gen. Mgr.

7-19-62

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