MEDICINE, HEALTH, & SAFETY 3- RADIATION Vol. 8

Vol. 8- Correspondence beginning with 7-17-64 to 12-31-65

MH&S 3- RADIATION

	Date	To	From	Class	Pgs.	No.	To	From	Class
1	8-7-64	Ruthenium-106	et						
2	8-12-64	AEC 604/88							
3	8-18-64	AEC 604/89 National Council on Radiation on Protection measurements	et						
4	9-10-64	AEC 604/90	et						
5	10-20-64	**Niue Island, NZ Thyroid Disease in Rongelap Islanders**	vee						
6	10-30-64	**Sat. Even. Post Anaktuvuk Pass, Alaska Whole Body Counter Team to Alaska**	vee						
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8	4-26-65	H.R.6961	et						
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11	9-9-65	**Utah Epidemiology Studies in Southwestern Utah**	vee						

7MH-S-3

DEC 30 1965

MEMORANDUM TO: CHAIRMAN SEABORG
COMMISSIONER RALPHEY
COMMISSIONER HAMEY
COMMISSIONER TAPE

THROUGH GENERAL MANAGER

SUBJECT: ARTICLE ENTITLED "CESIUM 137 BODY BURDENS OF ALASKAN MEN, SPRING 1965," IN NOVEMBER ISSUE OF PUBLIC HEALTH REPORTS

Public Health Reports is a journal put out monthly by the NEW USPHS and carries a variety of miscellaneous articles on activities in public health of the USPHS.

The article in question, "Cesium 137 Body Burdens of Alaskan Men, Spring, 1965," received considerable publicity recently. The press highlighted a statement to the effect that levels of cesium 137 in Alaska in noncaribou eaters were still four times those in the conterminous states. Unfortunately, unless the article were read rather carefully it does not become apparent that the studies were largely confined to five small communities, namely: Bethel, Kanakanak, Kotzebue, Mount Edgecumbe, and Tanana, where approximately 30 men each were sampled. There were 30 individuals sampled in Anchorage. The article does not indicate anything about the dietary habits or the ethnic background of the individuals other than that the men were divided into those who ate "caribou" and those who did not. For the purposes of this study, caribou and reindeer were used synonymously.

There appeared to be statistically meaningful differences between the levels of cesium 137 in those who ate "caribou" and those who did not. The exceptions were Mount Edgecumbe, where no one ate "caribou" meat, and Kotzebue, where everyone ate "caribou" meat, and at Tanana, where 83 percent were "noncaribou" eaters. The mean level in "caribou" eaters at Tanana was 57 nanocuries while that in the "noncaribou" eaters was 13 nanocuries. Thus more than half of the villagers were in the exception class. The mean level for "noncaribou" eaters in this Alaskan study was 20 nanocuries.

12-30-65

The value used for the mean level in the conterminous system was 12.5 nanocuries. There were some individuals eating Sitka deer but no "caribou who had levels up to 130 nanocuries (Mount Edgecumbe). There is no information on how much Sitka deer was eaten by other "non-caribou" eating groups. It is clearly indicated in the summary that the current average levels are well below the levels of the FRC Radiation Protection Guides.

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

cc: GM
AGMRD
Secretariat (2) ✓
D.Ink, AGM

MHoS-3

COMMONWEALTH OF PENNSYLVANIA
OA-533 6-64

ROUTE SLIP

Washington Office
Commonwealth of Pennsylvania
Suite 302; 1029 K Street, N.W.
Washington, D. C. 20006
296-8582 293-8523

SUBJECT
C. Ross Fluke
410 25th Street
Altoona, Pennsylvania

TO Dr. Glenn T. Seaborg, Chairman
Atomic Energy Commission

DATE SENT December 21, 1965

DATE TO RETURN

FROM James E. Van Zandt
Special Representative of the Governor

PURPOSE	☐ CIRCULATE	INITIAL	DATE
☐ APPROVAL			
☐ AS REQUESTED			
☒ COMMENT			
☐ INFORMATION			
☐ NOTE AND FILE			
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REMARKS

Please advise me relative to the attached.

☐ OVER

410-25th St
Altoona Pa
16602

December 17, 1965

Mr. James E. Van Zandt,
Special Representative
of the Governor
1629 K Street, N. W. - Suite 602
Washington, D. C. 20006

Dear Mr. Van Zandt:

Enclosed please find copy of an article which appeared in the December 9, 1965, issue of the Morrisons Cove Herald, subject: Red Cross Worker dies 19 years after atomic blast.

From the contents of the article it looks to me that there has been a neglect on the part of official or other authorities during her trying days, months and years until the time of her death, is it now too late to do her honor.

The reading of this article has deeply touched me and I cannot but help to believe that you will likewise be touched and perhaps may feel it wise to bring this matter to the attention of one or more authorities.

Sincerely,

C. Ross Fluke

MORRISONS COVE HERALD - DECEMBER 9, 1965

RED CROSS WORKER DIES 19 YEARS AFTER ATOMIC BLAST

Louise Brumbaugh gave her life in service of others--literally.

The former Red Cross hospital worker died at 9 a. m. yesterday at the home of her mother in Loysburg.

She was exposed to radiation from an atomic bomb in the South Pacific 19 years ago, where she was working to protect others from the danger.

It was in 1946, after seeing the horrible results of war in Europe, the South Pacific, Japan and China that she helped evacuate weeping natives from the Bikini atoll before it was blasted by an atomic bomb.

Her mother, Mrs. Oscar L. Brumbaugh, said that a calcium deficiency developed which resulted in the complete deterioration of three vertebrae near the base of the spine.

Although forced by the disability to retire from the civil service post she filled since the war, she received no financial assistance from the government to cover the costs of her final illness.

A sister commented:

"She served as a guinea pig and now seems to be as forgotten as one."

Miss Brumbaugh graduated from Replogle High School at New Enterprise, then received her bachelor's degree at Millersville State Teachers' College in 1934.

She first worked as a representative of the Department of Public Assistance in Bedford County and about 1940 became a hospital worker for the American Red Cross.

Her mother recalled that she was first assigned to Florida, then worked in an Atlanta hospital among war amputees. She then was assigned as a Red Cross hospital worker during the war in the South Pacific. Mrs. Brumbaugh said before her daughter died:

"Louise has been so active her whole life, serving others. She told me, for example, of a boy in an army hospital in the Marshall Islands. The doctors said he would never return home. On his birthday, Louise baked him a cake and decorated it with candles. He was so appreciative of someone showing an interest in him that he began to fight for his life. He got well and returned home. The doctors said they attributed his recovery to her."

After the war, Miss Brumbaugh became a civilian employe in the Army Special Services, serving as a club director, to bring recreation and entertainment to boys in various military camps, her mother said.

When Mrs. Brumbaugh visited her at Fort Lee, a soldier told her mother:

"Where does Miss B. get all her energy? She is always doing something to make life a little better for someone."

But finally, the effects of her radiation exposure began to take their toll. Over a year ago, she returned to her home in Loysburg where her condition had continued to grow worse. During recent days, she ate no food and slept most of the time, unable to sit up in bed.

Her sister, Mrs. Glenn Pressel of Loysburg, said that, miraculously, the intense pain caused by pinched nerves in the spine had abated. Her once vigorous body was wasted away and even the jaws hung loosely because of the bone deterioration.

Three years ago, Miss Brumbaugh told of her experiences with the bomb, in a widely distributed interview.

She was stationed on the Pacific island of Kwajalein when the U.S. conducted atomic tests on nearby Bikini Atoll.

Before the first bombs were exploded, Bikini and two other atolls had been completely evacuated of the native Marshallese. Kwajalein, headquarters for the Marshall Islands, and the take-off point for the B-29 Bombers which would carry the bomb, was evacuated also. It was feared that a tidal wave might engulf the island as a result of the explosion on Bikini, 200 miles away.

When the sun rose on July 1, 1940, the only persons, left on Kwajalein were a nurse, a doctor and bomber maintenance crews, and Miss Brumbaugh. She said in the interview:

"We watched the bombers take off. The sun was shining and it was a beautiful sight, but we didn't know then if we would live or die.

"We didn't go to bed at all the night before. We were up all night evacuating the military who had remained on Kwajalein until the last moment."

Previously, she had worked several weeks helping evacuate the Marshallese from the endangered areas. She remembered:

"It was heartbreaking for the natives. Most of them were crying. They had been on the islands for generations and did not want to leave.

"We waded out neck-deep in water helping them board the LSTs. They took all their possessions--pigs, goats, out-rigger canoes."

On the wall of the Brumbaugh living room is a large photo of Miss Brumbaugh talking to two native women clad in Mother Hubbards. One carries a pet cat and one a prized craw fish. Weeks after the evacuation, a photographer presented the unposed picture as a surprise gift.

Miss Brumbaugh said it was not her idea to remain on Kwajalein during the tests. "I was ordered to remain there. I guess they thought if we were not all blown up we'd be able to administer some assistance to the crews who serviced the planes."

The only visible result of the first explosion was that water rose about a foot. There was no tidal wave. The mushroom cloud was not visible.

After the second blast at Bikini, set off underwater among old ships, the wrecked, radioactive hulks were towed into Kwajelein harbor.

Navy men swarmed over the ships with Geiger counters. Miss Brumbaugh said, "Many of them were overexposed. Then, we didn't know as much about radiation and its effects as we do now."

She and a party of friends went swimming in the lagoon where the ships were anchored only 100 yards away.

"Then we discovered to our horror that the water in the

lagoon was heavily polluted. The ships were still disbursing radiation."

Miss Brumbaugh had been sent to Kwajalein for four months, but it was a full year before she returned home. Then the reception was cold.

"We were on a ship that had been used as a hospital lab for radiation tests. When we came into Honolulu harbor, they went over our ship with a Geiger counter and discovered that we were completely polluted. They didn't want us there."

In San Francisco, the reception was the same.

In her interview three years ago Miss Brumbaugh said that she did not know if she too did not suffer from an overdose of radiation. She made regular trips each six months for 15 years to Walter Reed Hospital where she was among the "prized guinea pig" patients undergoing continuing checks for possible ill-effects from radiation.

Now, however, the effects are known. And doctors, friends and family were helpless.

Her mother said that in recent months, as the calcium disintegrated, her daughter walked bent over farther and farther. The family physician told her that he could not understand how Louise was able to walk at all, but she had an indomitable spirit.

For a long while she refused the medication intended to relieve her pain. She wanted to know how her condition was developing, she said.

Now, her family has seen the price of radiation on one human guinea pig. They say they can't understand how one who gave her life in service should be forgotten when she can give no more.

Louise Brumbaugh was born July 24, 1912, a daughter of Oscar L. and Hazel (Plummer) Brumbaugh.

She leaves her mother, a sister, Mrs. Glenn Pressel of Loysburg, a brother, Robert, of Santa Ana, Calif., four neices and three nephews. She was a member of the Loysburg Methodist Church.

Friends will be received at the Gerald Weaver Funeral Home in Woodbury from 2 to 4 and 7 to 9 p. m. today. Services will be held at the funeral home at 10 a. m. Friday, in charge of her pastor, the Rev. J. R. Hackenberry. Burial will be in the Bedford Memorial Cemetery.

oooOooo

NH+S-3

UNITED STATES GOVERNMENT

Memorandum

Copy - Germantown

TO : File

DATE: December 20, 1965

FROM : Gordon Fowler

SUBJECT: SUPPLEMENTARY MATERIAL RELATING TO THE BRIEFING ON THYROID STUDIES PRESENTED AT MEETING 2165 ON DECEMBER 13, 1965

Attached is supplementary material prepared by the Division of Biology and Medicine, which relates to the briefing presented at Meeting 2165 on December 13, 1965 on thyroid studies being conducted in Washington County, Utah.

Attachment:
as noted above

cy filed O-M-6 Briefing

12-20-65

In 1963 the Division of Radiological Health of the Public Health Service began two separate studies in the states of Utah and Nevada. The first was a study of the records of all thyroid surgery that had been performed in the two states during the period of 1948 to 1962. This involved a search of the records of about a dozen individual pathologists who served the two states. This study is now in midstream, although from a preliminary examination of the 1200 surgical reports, it seems unlikely that there will be any significant trends with respect to thyroid pathology in the fallout area. It is intended that this data be completed for presentation at the International Cancer Congress in Tokyo next October.

The second study was a survey of leukemia rates as derived from death certificates in the two states. This study is nearing completion. A copy of a preliminary tabulation of this material is in the Division of Biology and Medicine.

In the early part of 1965 three separate groups from the PHS who had interest in a survey of a previously irradiated population combined efforts and made plans for a survey of school children in Washington County Utah. The three groups were as follows: the first was a group of geneticists who were interested in testing for genetic traits in the Washington County sample; the second was a group from the Dental Institute who were interested in the possibility of detecting dental changes related to irradiation, and the third was a group led by Dr. Thomas London of the National Institute of Metabolic Diseases. Dr. London had developed a technique for objectively quantitating changes in the thyroid gland as found by examination . Because of the previous interest of the Division of Radiological Health in the possibility of thyroid abnormalities in the Washington County area, it was agreed that Dr. London together with six physicians chosen

by the Public Health Service would accompany the survey group and include in the examination of the school children an evaluation of the thyroid glands in this population.

The population to be examined was to consist of all children of the County between the ages of 12 and 18 years. The lower level, age 12, was chosen because of the dentists' interest in examining permanent teeth. The examination was adopted as part of the school examination program so that the eligible high school children were examined. The total number of children examined in Washington County was about 1700 (and not 2000 as reported previously).

A control population was sought and for this purpose Safford, Arizona, was chosen. This population was chosen because it was thought to match in many respects the Washington County population which is strongly Morman in character. The examination in Safford differed from that in Washington County in that it was not mandatory; the children's parents were offered the examination on a voluntary basis. About one-third of these children refused examination. Most of the children who refused examination were members of the Mexican population who comprise about 40 percent of the Safford population, a fact which evidently had not been previously recognized. The examinations themselves took place in late September, the six physicians assembling in St. George for an orientation session, half of them then going off to Safford, Arizona. Halfway through the examination the two teams of physicians switched locations, that each of the physician teams examined half of the population of children in each area.

It should be pointed out that although the study in Utah has been associated with the town of St. George, the population examined was actually that of Washington County, of which the population of St. George is about one-half.

There are two smaller communities, Hurricane and Enterprise, which together comprise about 30% of the population of Washington County.

Of the six physicians who participated in the examination, four were Public Health Service Officers, one was a Resident Physician from the University of Utah School of Medicine, and the sixth was a physician chosen by Dr. Reiss and his associates in St. Louis who have shown interest in the Utah population. The examination procedure was as follows: Each of the children was examined individually by three different physicians. The physician graded the child's thyroid with respect to three different criteria, visible enlargement, palpable enlargement, and nodularity. A grade of zero reflected absence of enlargment or absence of nodularity. A grade of two indicated definite enlargement or nodularity. A grade of one indicated a questionable finding.

Of the 1700 or so children so examined in Washington County, 70 or more were found to have a combined score for nodularity of two or more and 38 were found to have a combined score for nodularity of three or more. Of these 38 children, 35 were then reexamined by the total group of six physicians, who assigned a priority of one, two or three, depending upon the degree of suspicion of lesions. Eleven children were given a priority score of one. It's of interest that of these eleven persons seven have not been permanent residents of Utah, and four were long-time residents of Washington County. One of the eleven high school students is an elderly mother who is completing her high school education. (See accompanying table)

The 70 children who have been given a score for nodularity of two or more by the first group of examiners were then reexamined by the group of three experts chosen for the purpose by the Surgeon General. This group of experts

selected nine of the Utah children for hospitalization. Five or six of these had been among the eleven selected as most strongly suspicious by the previous PHS team. Residential histories on these 9 children are not yet available but should be within the next several days. The data collected by the second group of experts is now being prepared as a report which will be submitted to the Surgeon General probably in January. The recommendation of these experts was that the nine children selected as having highly suspicious lesions be hospitalized at the University of Utah Medical School in Salt Lake City. The first two children were hospitalized last week and it is expected that all nine persons will be hospitalized within the next month. The expenses of these hospitalizations will be born by the Division of Radiological Health paid through the Utah State Department of Public Health under the Crippled Children's Services provisions of that Department. It is expected that all of these children will have a surgical biopsy of the thyroid gland although this decision will rest with the attending staff who will first consider diagnostic test.

The team of experts also recommended that an additional 18 children in Washington County and 16 children in Safford have diagnostic blood test done and be examined once again in May of next year.

No dietary nor residential history was obtained from any of the examined population in either locality with the following exception: 35 of thechildren with suspicious lesions in Washington County (those with a score of 3 or more) were questioned by one of the physicians as to length of residence in Washington County and with respect to source and quantity of milk. A questionnaire has been devised which will be used by public health nurses to survey the entire 70 families in Washington County whose children were found to have suspicious lesions. This will include the 9 children to be hospitalized. Collection of

this material is essentially complete and should be available soon.

The second expert committee has been appointed by the Surgeon General, this a group of three biostatisticians. The first meeting of this group together with Ed Weiss of the DRH was held last Friday. The major recommendation of this group was that the new questionnaire be completed by all 1700 members of the Washington County population. This is not yet begun, nor is it yet certain what group of persons will be used to collect the questionnaire information. He is considering the use of school teachers either from the high schools or a local junior college. I have also learned that members of this committee were disturbed about certain aspects of the study, namely, reports from the expert clinicians who found an unusual incidence of thyroiditis among the Safford children as well as the different racial composition of the Safford children.

The study is in its early stages. The prospects for completion are such that one probably cannot hope for a final report for at least another year.

PHS Survey

	Washington Co. Utah (1700 Students)	Graham Co. Arizona (1400 Students)
One out of three physicians believe nodules present	70	25
Two out of three physicians believe nodules present	38	10
Six out of six physicians believe nodules present	18	0
"First Priority"	11*	0

* Of these 11 children, only 4 were life long residents of Washington County; the others were recent entrants either from other parts of the state or from out of state.

Thyroid Expert Survey

	Washington Co. Utah	Graham Co. Arizona
Examined	70	25
Recommended for hospitalization	9*	0
Recommended for blood tests and follow-up examination	18	15

* Of these 9 children, 5 or 6 are from the group of 11 identified as "first priority" above. Residential history is not yet available on those not yet included, but will be next week.

Background Material on Thyroid Neoplasms

The following notes are offered as background material for an understanding of the thyroid disease now being studied among irradiated children.

1. What are thyroid nodules?

   These are lumps that are felt by the examining physician in the thyroid gland. They may be single or multiple. Since the thyroid gland lies buried beneath the skin, the nodule must be at least one centimeter in diameter before it can be felt, but this will depend on the experience of the physician, the location of the nodule within the gland and the amount of fat overlying the gland.

2. How common are these nodules?

   No one really knows the answer to this crucial question. In one study, the heart study at Framingham, 4% of the population examined had noduler thyroid glands. There are certainly regional differences.

   Thyroid glands have been examined in autopsy series and here, the frequency of nodules is as high as 50%[1].

3. Why are nodules of concern?

   Most nodules are benign adenomas, some are cancers. The percentage of solitary nodules that are malignant appears to be about 20%, whether at surgery[2,3] or at autopsy[1].

   If one considers this latter figure, 20% of nodules being malignant, and remembering that about half of the autopsies demonstrated nodules, then it appears that about 10% of all persons dying have thyroid carcinomas.

   Yet, death due to carcinoma is rare[4], probably less than 1/100,000 deaths. The implication is that the vast majority of thyroid carcinomas are benign, and although they fulfill the pathologists criterion of malignancy, do not produce clinical disease.

4. Can the pathologist distinguish the "benign" carcinomas from those that produce death?

   Yes, those that are benign show well differentiated cellular structure. These are called papillary. They are usually found in younger persons. Those that are highly malignant are undifferentiated, i.e., cells show little resemblance to normal cellular morphology. These are called anaplastic carcinomas.

5. Do the adenomas or the papillary carcinomas ever become anaplastic carcinomas?

The answer to this is not known, but if it happens, it must happen very rarely because of the great number of the former and the rarity of the latter.

References

1. Mortensen, J.D.; Woolner, L.B.; and Bennett, W.A.: Gross and Microscopic Findings in Clinically Normal Thyroid Glands, J. Clin. Endocr. 15:1270-1280 (Oct) 1955.

2. Cole, W.H.; Slaughter, D.P.; and Rossiter, L.J.: Potential Dangers of Nontoxic Nodular Goiter, JAMA 127:883-888 (April 7) 1945.

3. Sloan, L.W. and Frantz, V.K.: Thyroid Cancer: Clinical Aspects in Thyroid, New York: Paul B. Hoeber, Inc., 1955, pp 375-395.

4. Sokal, J.E.: "Incidence of Thyroid Cancer and Problem of Malignancy in Nodular Goiter", in Clinical Endocrinology, I, New York: Grune & Stratton, Inc., 1960, pp 168-178.

[redacted] MHTS-3-

Copy - Germantown

OPTIONAL FORM NO. 10
5010-104
UNITED STATES GOVERNMENT

Memorandum

Reference & Reproduction Branch

TO : C. L. Dunham, Director
Division of Biology & Medicine

DATE: December 15, 1965

FROM : W. B. McCool, Secretary *Original signed W. B. McCool*

SUBJECT: THYROID STUDIES IN THE FALLOUT AREA OF UTAH BY THE USPHS

SECY:GF

1. At Meeting 2165 on December 14, 1965, the Commission noted the studies would be continued to obtain more definitive results.

2. The General Manager has directed you to the required action.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Exec. Asst. to Gen. Mgr.
Asst. Gen. Mgr. for R&D
Asst. Gen. Mgr. for Operations
General Counsel
Director, Operational Safety
Director, Congressional Relations
Director, Public Information

CONFIRMED TO BE UNCLASSIFIED
AUTHORITY: DOE - DP/OC
BY: H. Hoppe DATE: 12/1/85
By: J. Ahl 1/24/86

a/f filed 0-M-6

[redacted]

12-15-65

7m/d. S 3

DEC 8 1965

Dear Wallace:

I am writing in response to your letter of November 19, 1965, asking that the Atomic Energy Commission consider transferring $1,000,000 to assist the U. S. Public Health Service in its studies of thyroid disease among St. George, Utah, and Safford, Arizona, children.

We are following these studies with great interest and are in close contact with the Public Health Service. It is our understanding that the Public Health Service is in the process of developing further plans and needs for resources, but has not requested transfer of AEC funds for the current work. Both agencies are examining the need for further studies. Staff members of the Public Health Service and the AEC have been in close contact in exchange of information and discussion of the matter since its earliest stages. We have assured the Public Health Service of our full cooperation and that we will assist them actively in any way we can in the performance of the studies.

Cordially,

/s/

Chairman

Honorable Wallace F. Bennett
United States Senate

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MNTS - 3. Radiation

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AEC 604/92

December 8, 1965

COPY NO. 23

ATOMIC ENERGY COMMISSION

INFORMATION MEETING ITEM

THYROID STUDIES IN THE FALLOUT AREA OF UTAH BY THE USPHS

AEC 604/92

Note by the Secretary

The General Manager has requested that the attached report by the Director, Division of Biology and Medicine, be circulated for Commission consideration at an early Information Meeting. The report is in response to a memorandum of November 22, 1965 from Commissioner Ramey.

W. B. McCool

Secretary

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[redacted]

ATOMIC ENERGY COMMISSION

THYROID STUDIES IN THE FALLOUT AREA OF UTAH BY THE PUBLIC HEALTH SERVICE

Report to the General Manager by the
Director, Division of Biology and Medicine

Following the publication of a news report in The Washington Post of November 15, 1965, regarding thyroid studies in the fallout area of Utah by the Public Health Service, Commissioner Ramey requested staff briefing which follows:

The article, by Mr. Howard Simons, reported the following:

1. Of 2,000 children between the ages of 10 and 18 studied in St. George, Utah, by a team of medical experts, hospitalization has been recommended for nine and blood studies for 18.

2. No children in the control population at Safford, Arizona, have been recommended for hospitalization, but 16 will have their blood tested.

3. The experts were identified as Dr. Brown M. Dobyns of Western Reserve Medical School, Dr. Raymond F. Keating, Jr., of the Mayo Clinic, and Dr. Joseph E. Rall of the National Institutes of Health.

4. Although no relationship between ingestion of fallout nuclides of iodine and thyroid abnormalities has yet been established, recent evidence such as that from the Marshallese accidentally exposed to fallout in 1954 suggests a causal effect.

BACKGROUND

In the spring of 1963, the Division of Operational Safety requested

Dr. Donald R. Chadwick, Chief, Division of Radiological Health, USPHS, to undertake a study of potential thyroid cancer in Utah, and he agreed to do so. This request was subsequently pursued by Chairman Price in the Congressional Hearings of 1963. These studies, funded by the National Dental Institute, were initiated this year.

Initially, two teams of three physicians each conducted the preliminary examinations between September 17 and October 11 of this year. During the survey the physicians switched areas so that in each group, half would be done by each team. After the preliminary screening a consensus clinic was held to determine how many positive identifications could be concurred in by all six physicians. The results were:

	Washington County, Utah (2000 students)	Graham County, Ariz. (1400 students)
One out of three physicians believe nodules present	70	25
Two out of three physicians believe nodules present	38	10
Six out of six physicians believe nodules present	18	0

At a meeting of the Federal Radiation Council on October 26, this material was discussed and it was recommended that:

a. The Department of Health, Education, and Welfare proceed with the PHS proposal to have the children examined by expert medical consultants.

b. The proposed press release be drafted in the form of a progress report. The release should stress the preliminary status of the study and point out the inability to draw conclusions from the present information.

c. The Staff of the Joint Committee on Atomic Energy be briefed on the subject.

d. The release be issued simultaneously in Washington and Utah.

e. Further public statements on the project by the Department be made contingent on the Department's determination that either positive or negative conclusions can be reported.

On October 28, 1965, DHEW released to the press a preliminary announcement of the findings as described above. (Attachment 1).

During the next phase of the program, the PHS called in a panel of three experts (as named in the Simons' article) to examine the 70 students in Utah and the 25 in Arizona. The panel carried out these examinations in mid-November.

When these physicians and nurses returned to Salt Lake City, they were met by newsmen but refused to make public statements, undoubtedly influenced by the recommendation of the FRC as outlined above.

Dr. Carlyle Thompson, Director of Health of the State of Utah, was also approached by reporters and also refused to answer questions about thyroid abnormalities found. He did, however, divulge the numbers of children who were to be hospitalized. This information was then published in the Deseret News (Salt Lake City) from which it was subsequently picked up by United Press International. This, we understand, became the source from which the Washington Post article of November 15 was written.

Subsequently, a letter was received by Dr. Dunham, dated November 29,

1965, from Mr. James G. Terrill of the Division of Radiological Health, PHS, confirming the data reported in the Washington Post and containing the following paragraph:

> The thyroid experts returned to their respective homes about November 18 or 19 and during the week of November 22-26 our Research Branch has been preparing a summary of all of the data collected for the review of the expert committee. It is anticipated that the expert group may make a written report to the Division by December 15 if there are no sharp differences involved. As soon as the written report is received, you will be informed of any conclusions, apparent disagreements, etc. that may exist between the experts.

At the 15th session of UNSCEAR in Geneva on Friday, November 19, Dr. Chadwick advised Dr. Dunham that just prior to his (Chadwick's) departure from the States for Geneva on November 17, he had heard by telephone that the three specialist consultants had finished their examination of the 95 suspect children in the two towns and had found in the St. George group what they agreed were four with benign thyroid nodules, one of which has a 20% chance of being malignant and one other with a 50% chance of being malignant. A fifth child was found to have a thyroglossal duct cyst (a not uncommon congenital anomaly). A sixth child had some other condition, not a thyroid tumor.

Certain features of the Utah studies are worthy of comment:

1. The amount of radiation to which the thyroid glands of the St. George children were exposed is unknown as no measurements were made at the time. One estimate of exposure suggests 120 to 440 rads; a second estimate was 68 rads with an uncertainty factor of 4. These are the estimates of Drs. Mays and Knapp quoted in the Congressional Hearings of 1963 (Fallout, Radiation Standards and Countermeasures, p. 554).

Both of these estimates were based on attempted extrapolation from other data, such as external gamma dose rates three feet above the ground, and suffer severe limitations of credibility.

2. In addition to these uncertainties with respect to the mean exposure of thyroid glands among the children of St. George, we have no information whatsoever about potentially much higher (or lower) doses that might have been received by individual children living on farms consuming milk from their own cows rather than from the pooled city milk supply. Nor do we know whether the children now found to have thyroid abnormalities are from the former or the latter areas.

3. The Division of Operational Safety has requested NV to have the PHS-Nevada (under a current Memorandum of Understanding) obtain the necessary physical data to match the medical data. For example, about 80 percent of all of the fallout in southern Utah occurred within a few months in 1953 and, in fact, two-thirds of all the fallout resulted from one explosion on May 19, 1953. It is critical, therefore, to determine if the children in question were or were not present during the specific periods of time.

4. The problem of arriving at valid statistical conclusions of prevalence rates of thyroid abnormality in such small populations as those in St. George and Safford are probably insurmountable.

5. Data on the prevalence of thyroid nodules in normal human populations do not exist. In the absence of such data, interpretation of the effects of radioiodine ingestion on the thyroid gland must remain tentative.

That radionuclides of iodine can induce late effects of the thyroid seems to be reasonably well established: 75 percent of the Rongelap children exposed to fallout in 1954 have developed thyroid abnormalities. What remains a major research problem is the dose-response relationship, i.e., what dosage to a human population will produce what percent of late complications of the thyroid. The effect of simultaneous whole body radiation presents an additional unsolved problem.

6. The relationship of the benign thyroid adenoma (which is probably the cause of the majority of the thyroid abnormalities which are being found in Utah and among the Marshallese) to thyroid cancer is not clear. The usual presumption is that the former may progress to the latter, although this is not proven.

ATTACHMENT I

U. S. Department of
Health, Education, and Welfare
Public Health Service
Washington, D.C. 20201

FOR RELEASE A.M. PAPERS
Thursday, October 28, 1965

A progress report on a study of thyroid conditions in approximately 2000 Washington County, Utah, school children and a group of about 1400 students in Graham County, Arizona, was given today by Dr. G. D. C. Thompson, Utah State Health Director, at a regular meeting of the Utah State Board of Health. The report was made public simultaneously by the Public Health Service, U.S. Department of Health, Education, and Welfare, which is conducting the study in cooperation with the State.

The study is part of a long-term investigation to determine whether a statistically meaningful relationship might exist between certain health defects, which may occur naturally, and exposures to radiation. The information being gathered includes such data as family history of thyroid abnormalities; residence history; and exposure to medical and dental radiation as well as exposure to fallout from the Nuclear Test Site in Nevada which might have been received in the 1950s.

The report is as follows:

> Preliminary physical examinations of the thyroid glands of students in both communities by a team of physicians organized by the Public Health Service began September 17, 1965, and were completed October 11. Each student was examined independently by three physicians.
>
> At least one physician in each instance was of the opinion that thyroid nodules or small lumps, might be present in 70 of the Utah students and in 25 of the Arizona group.

The data are not yet complete enough to warrant drawing any conclusions from the apparent difference in the incidence of nodules in the two groups. Nor do we have any statistical data on the incidence of thyroid nodules in the general population.

A panel of three nationally recognized medical experts on the thyroid gland has been appointed to conduct further study on the 95 cases.

Commenting on the progress report, Surgeon General William H. Stewart of the Public Health Service made the following statement:

"In this preliminary phase it is not possible to assess the medical significance of these findings. We need to determine first, the significance of the thyroid nodules which may be present; and second, what further diagnostic or therapeutic procedures are indicated.

"Among the abnormalities which may be associated with thyroid nodules are non-toxic goiter, inflammatory diseases of the thyroid, and either benign or malignant tumors."

Dr. Stewart said the Public Health Service has called together a panel of nationally known medical authorities on the thyroid gland for further study of the two groups. They will conduct their study in mid-November and will determine whether further diagnostic procedures are required. Family physicians, parents and health authorities will be advised concerning each individual situation.

Members of the panel are: Dr. Raymond F. Keating, Jr., Mayo Clinic; Dr. Brown M. Dobyns, Cleveland General Hospital; and Dr. Joseph E. Rall, National Institutes of Health.

The Surgeon General said it would be difficult to ascribe a definitive cause to any thyroid abnormalities found in the study since thyroid

irregularities may occur naturally and information about the patterns of their occurrence is inadequate.

"For this reason additional information remains to be collected. This will include: the history of goiter among families of the students; the history of their residence during the 1950s; dietary habits; present medical status with particular reference to endocrine disorders; and history of radiation exposure of any sort, including medical diagnosis or treatment, or fallout.

"Because of the lack of information about the normal incidence of thyroid abnormalities such as nodules, definitive conclusions cannot be drawn. To help fill this gap and provide baseline information we are investigating the possibility of conducting similar studies of the thyroid in other communities."

ZMA 5-3

UNIVERSITY OF CALIFORNIA

Bio-Medical Division L-613
LAWRENCE RADIATION LABORATORY
P. O. BOX 808
LIVERMORE, CALIFORNIA 94551

December 6, 1965

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

Dear Doctor Seaborg:

This is a copy of the memo to Dr. Dunham, being sent you as per your request.

Sincerely yours,

John W. Gofman

JWG:ms

Enc.

12-7-65

LIVERMORE: LAWRENCE RADIATION LABORATORY
ROOM: 310 BLDG.: T-113

December 6, 1965

MEMO

TO: Charles L. Dunham, M.D., Director
Division of Biology and Medicine
U.S. Atomic Energy Commission
Washington, D. C.

FROM: John Gofman and Arthur Tamplin
University of California
Lawrence Radiation Laboratory
Livermore, California

SUBJECT: The Problem of Potential Thyroid Pathology in Washington County, Utah

Dear Chuck:

As you are, of course, well aware, we have been deeply interested in learning all we can relevant to the issues of dosimetry from weapons tests and possible effects of any doses of radiation that may be received.

Recently, as a result of the U.S.P.H.S. announcement of the thyroid nodule study in St. George, Utah and Safford, Arizona, the director of L.R.L., Dr. May, requested that we brief the laboratory directors on this entire problem and express some opinion concerning the final likely outcome of studies in St. George, Utah. One of us (Arthur Tamplin) had already been engaged in efforts concerning thyroid dosages from weapons tests, a full report of which will be sent to you in the early future(1). The other of us (John Gofman) reported to the directors that it was quite likely that the Utah situation will look worse before it ever gets to look better.

Dr. May was quite disturbed to hear that there existed a possibility that the worst news might yet be ahead of us and discussed some of our estimates with Chairman Seaborg. Dr. Seaborg, in turn, requested that Dr. May get us to

send you the basis for our concern and send him a copy of such material. This is the background for this memo to you.

We have noted that numerous references in the press and in other media have indicated that government officials lean in the direction of being critical of the Utah-Arizona studies and in the direction of finding numerous possible answers for the observations, alternative to radioiodine.

We prefer to view the entire question in a wholly different manner, disregarding, for the moment, the details of the current U.S.P.H.S. studies, and focussing attention upon 3 questions:

(a) What dose of radiation was delivered to thyroids of children in St. George, Utah?

(b) At such dosage, is cancer of the thyroid to be expected in any appreciable number of children?

(c) If cancer of the thyroid is to be expected, will it be possible to conduct unequivocal studies to demonstrate that cancer of the thyroid is or is not occurring there and that the findings are or are not related to radioiodine ingestion?

(a) What Dose of Radiation was Delivered to Thyroids of Children in St. George, Utah?

Directly, of course, we shall never know, since no thyroid or milk I^{131} measurements were made in the 1951 through 1955 period, when the probable exposure occurred. However, the possibility for reconstructing the dosimetry to individuals seem to be as good as was the case for

for Hiroshima, although clearly the uncertainties involved are of a very different nature.

It appears that children in St. George, Utah during 1953, and between the ages of 0-5 years, drinking a liter of fresh milk per day, must have accumulated a most probable dose of 1200 rads to their thyroids from radioiodine. The uncertainty in the estimate is not likely to be more than a factor of 2. The basis for this estimate is given in the attached pages, excerpted from the forthcoming report referenced above (1).

(b) At such dosage, is Cancer of the Thyroid to be expected in any appreciable number of children in the St. George area?

At present, the only evidence in humans concerning radiation induction of thyroid cancer arises

(a) from several studies of x-irradiated children

(b) from the study of the Rongelapese exposed to fallout. Unfortunately, the Rongelapese data are obscured by the fact that the exposure was a mixture of internal radioiodine exposure plus external total body irradiation.

(c) the relatively few cases reported concerning hyperthyroid children treated with radioiodine.

The x-irradiated children (group a) are by no means representative of the population-at-large, nor of the children in St. George, Utah. Further, tissues other than thyroid were in the radiation field. Lastly, the rate of exposure by x-rays was different from that for radioiodine deposited in the gland.

The hyperthyroid children (group c) are clearly non-representative, already having known thyroid pathology. Furthermore, the dosages are much higher than those relevant for St. George.

It would seem that the x-ray data, (group b) inadequate as they are, represent our best guide at this stage. You are, of course, familiar with the final estimate of the U.N.S.C.E.A.R.[2], placing the risk at between 0.5 and 1.5 cases/10^6/year/Rad, with the risk operating over 15 to 20 years, for doses in the range of 100-300 Rads. The Federal Radiation Council has not seen fit to argue this estimate.

The middle point of the x-ray data leads to an estimate of a lifetime incidence of about 15 cases of thyroid cancer per 10^6 exposed children per rad to the thyroid, for the 100-300 rad exposure range. Our problem this time is not over extrapolating to low doses, but rather extrapolating to high doses.

We are mindful of the Dolphin and Beach[3] suggestion that x-rays may be 10 times as effective as I^{131} in carcinogenic power. Considering the dependence upon data in the rat and the tenuous nature of their arguments, we don't believe that this suggestion offers a reliable basis for reducing our estimate of the likely outcome in Utah.

Therefore, assuming x-rays and I^{131} to be equally carcinogenic per rad absorbed, we have

Expected incidence of thyroid cancer at St. George = (Risk) x (Dose) x (No.Exposed)

$$= \frac{15}{10^6} \times 1200 \times 2000$$

= 36 expected cases of thyroid cancer

While we hope this estimate is too high, as realists, we will not be surprised if it is just right or even if it is low by a factor or two.

(c) If Cancer of the Thyroid is to be expected, will it be possible to conduct unequivocal studies to demonstrate that cancer of the thyroid is or is not occurring and that it is or is not related to radioiodine ingestion?

How perfectly the present study is being carried out, or how accurately the findings will be reported by the current investigators is really not the most relevant issue. Least profitable would be debates concerning what ultimately will be minor epidemiologic issues.

The point we are making is that options are available to ascertain the truth unequivocally. Two such study options are the following:

(1) Determine the incidence of thyroid nodules in the parents of all children in St. George, Utah. This incidence should then be compared with that in the children. Since the thyroid gland of the parents should have been 10 times larger at the exposure time than that of the 0-5 year old children, the dosage to the parents' thyroids should have been 1/10 as large. If the children

show a higher incidence than their parents now, it will indeed be difficult to blame heredity, geography, climate, iodine supply, etc. If the children show the same or a lower incidence than the parents, it might be argued that the parents have had a longer period in which to develop nodules, and that, at a comparable age, the incidence in the children will possibly exceed that in the parents. Therefore, a second study is also suggested.

(2) Based upon the dosimetry estimated to be detailed in[1], it appears that

Children, 0-5 years of age in 1953 in Salt Lake City, Utah received of the order of 100 rads or less than 1/10 the St. George dosage;

Children, 0-5 years of age in 1953 in Albuquerque, N. M. received half the Salt Lake City dosage;

Children, 0-5 years of age in 1953 in Safford, Arizona or Los Angeles, California received less than 1/10 the Salt Lake City dosage.

Therefore, the incidence ratio for children to parents now for these additional communities should be compared with the ratio for St. George, Utah. In view of the very large range of estimated dosage thus encompassed, a dose-effect relationship operating on this incidence ratio will probably not be equivocal.

Of course, such studies will only refer to thyroid nodules. Resolution of the implication with respect to cancer requires biopsy, time, or both.

References:

(1) Tamplin, A. and Fisher, L. Estimation of Dosage Delivered to Thyroids of Children for Nuclear Device Tests in Nevada during the Years 1952 through 1955 (Tumbler-Snapper, Upshot-Knothole, and Teapot Series) UCRL In Print

(2) Report of the United Nations Scientific Committee on the Effects of Atomic Radiation. III. Thyroid Neoplasms, p 91093. Also Table XVI. "Thyroid Cancer Following Therapeutic Irradiation" p 105, General Assembly. Official Records: Nineteenth Session, Supp. No. 14 (A/5814) 1964

(3) Dolphin, G. W. and Beach, S. A. "The Relationship between radiation dose delivered to the thyroids of children and the subsequent development of malignant tumors." Health Physics 9, 1385-1390, 1963.

copies to:

Dr. Glenn T. Seaborg, Chairman, U.S.A.E.C.
Dr. Michael May, LRL, Livermore
Dr. Roger Batzel, LRL, Livermore

This is an excerpt from a more extensive report that is now in the final stages of preparation:

ESTIMATION OF DOSAGE DELIVERED TO THYROIDS OF CHILDREN THROUGHOUT THE UNITED STATES FROM NUCLEAR DEVICE TESTS IN NEVADA DURING THE YEARS 1952 THROUGH 1955 (TUMBLER-SNAPPER, UPSHOT-KNOTHOLE, AND TEAPOT SERIES)

Arthur R. Tamplin
H. Leonard Fisher

The estimation of the dosage at St. George, Utah, is based upon the open-field gamma dose rate at H + 24 hr.. The entire Virgin River Valley was selected for this analysis. Figure 1 is a map of the Nevada-Utah area. The Virgin River Valley includes the towns of Glendale Junction, Bunkerville, and Mesquite, Nevada, as well as St. George and Hurricane, Utah. The Valley has a total population of some 9,000.

Table I presents the data abstracted from the Off-Site Radiological Safety Reports (1-3) and is arranged in chronological order by test shot. The value recorded is the open-field gamma dose rate at H + 24 hr (that is, 24 hr after the explosion). If the data were given for some time other than H + 24 hr, they were corrected to this time using the $T^{-1.2}$ decay law.

ANALYTICAL METHOD

The major route of entry to man for fallout iodine in the United States is through cow milk. Therefore, the dosage estimates in this report are based upon cow milk as the sole source of the iodine. Thus, the overall approach involves converting the mr/hr to $\mu Ci(I\text{-}131)/m^2$, calculating the resultant concentration in cow milk, and finally, converting this into an estimate of the dosage to a two gram infant thyroid.

mr/hr to $\mu Ci(I\text{-}131)/m^2$

It has been shown for this series of tests that 1 mr/hr is equivalent to 100 μCi (fission products)/m^2 at distances up to 160 miles from ground zero (4). At 24 hr I-131 represents approximately 1 per cent of the total activity of unfractionated fission products. This leads to the coversion at H + 24 hr:

$$1 \text{ mr/hr} = 1 \ \mu Ci(I\text{-}131)/m^2$$

Concentration in Cow Milk

The estimation of the concentration of I-131 in cow milk involves 3 factors: (1) The amount of forage ingested by the cow per day, (2) the half-life of I-131 on the forage, and (3) the fraction of the daily dosage secreted in cow milk. The latter factor includes the biological availability of fallout iodine.

Conversion to μCi/cow day

It has been shown in a previous report from this Laboratory (5) that a reasonable estimate of the actual area producing forage consumed by a cow on pasture in one day is 45 m^2. Other estimates have been higher. Garner (6) assumes 160 m^2/day. However, in order to obtain correspondence with milk data, he assumes 25% retention of fallout on edible herbage. Hence, his values give 160 (.25) or 40 m^2. The 25% figure represents poor pasture utilization rather than fallout retention. When cows are fed by green-chop methods, this utilized area factor is reduced to 30 m^2/day because of better pasture management and higher yields of forage per acre. In the subsequent analysis, the figure 45 m^2/cow-day will be used. This, of course, will be an overestimate in areas where green-chop feedings is used. When stored feed is employed, essentially no fallout iodine reaches the milk. In many areas, dairy herds may be on stored feed well into March. This has not been taken into account in the estimates shown in Figure 1.

The daily dose ingested by the cow will thus be determined:

$$\left(\frac{\mu Ci(I\text{-}131)}{m^2}\right)\left(\frac{45\ m^2}{cow\text{-}day}\right)$$

Half-life on Forage

The subject of the half-life of radionuclides on plants has been reviewed in a previous report from this Laboratory (7). It was shown that the average half-life for I-131 is about 5 days with a range of 4 to 6 days. A half-life of 5 days is used in this analysis.

Concentration in Cow Milk

Another report from this laboratory reviews the secretion of iodine in cow milk (8). It demonstrates that, for the average case, the I-131 concentration in cow milk is given by:

$$C_M = (0.011)\ I_o\ (e^{-0.139t} - e^{-0.346t})$$

where

C_M = concentration in μCi/l,

I_o = μCi/cow-day on the first day of contamination,

0.139 = rate corresponding to the 5 day half-life on plants,

0.346 = rate corresponding to the 2 day half-life observed for I-131 in the blood and milk,

and

0.011 = fraction of the daily ingested dosage secreted per liter of milk.

t = time in days post contamination.

The above equation is based upon the finding that approximately 1% of the daily dose appears per liter of milk at equilibrium. This figure may be too low since the data indicate that a value approaching 1.5%/liter might be more appropriate during the spring months. However, the lower value has been used in the analysis.

I_o in the above equation is given:

$$\left(\frac{\mu Ci(I\text{-}131)}{m^2}\right)\left(\frac{45\ m^2}{cow\text{-}day}\right) \quad (0.8)$$

The factor 0.8 represents the biological availability of fallout iodine as determined for debris from a tower shot in the Buffalo Series of tests conducted by the British (9).

Estimation of Infant Thyroid Dosage

The estimation of infant thyroid dosage will depend upon 4 factors: (1) The daily intake of I-131, (2) the fraction of the intake incorporated in the thyroid gland, (3) the half-life of I-131 in the thyroid, and (4) the weight of the thyroid gland.

For this report, the intake of I-131 is assumed to result solely from milk and the infant or child is usually assumed to consume 1 liter of milk per day. This estimate has been used in these analyses. Quite likely, most infants that are bottle fed would be receiving can milk in their formula rather than fresh cow milk. Hence, it may be more reasonable to apply these estimates to children that are 1 year old or older.

Reasonable estimates of the other factors are:

30% uptake by the thyroid gland of the daily ingested I-131,

7.5 days for the effective half-life in the gland,

2 grams for the weight of the gland for children from 1 to 5 years old.

These are the assumptions that have usually been applied to human thyroid dosage calculations, and a review of this subject by a member of this Laboratory indicates that they are in substantial agreement with experimental evidence (10).

Using these assumptions, the total I-131 in the gland (C_T) at any time is given by integration of the following equation:

$$\frac{dC_T}{dt} = 0.3C_M - 0.092C_T$$

Substituting for C_M and integration yields:

$$C_T = (0.275)\ I_o\ (-0.254e^{-0.139t} + 0.047e^{-0.346t} + 0.207e^{-0.092t})$$

The total integrated concentration in the gland (μCi-days) is given by the area under the curve for the above equation. This leads to:

$(\mu Ci\text{-days/thyroid}) = 0.16I_o$.

This can be converted to dosage to a 2 gram thyroid using relationship, 1 μCi-day/g = 10 rad and substituting for I_o:

$$Rad = 30\ (\mu Ci(I\text{-}131)/m^2).$$

ESTIMATED DOSAGE AT ST. GEORGE

Inspection of Table I indicates that the entire Virgin River Valley area was contaminated by this series of shots rather than some localized hot-spot. Furthermore, it appears reasonable to assume that the entire valley was contaminated to the extent of 40 mr/hr at 24 hr. Shots Annie and Harry contaminated the Utah area and shot Simon contaminated the Nevada area. This leads to an estimated dosage of 1200 rad to the thyroids of children in this area.

COMPARISON WITH FIELD STUDIES

$\mu Ci/m^2$ to μCi/l

The conversion of $\mu Ci(I\text{-}131)/m^2$ to μCi(I-131)l contains an assumed value of $Kg(forage)/m^2$. In this report it is assumed to be 0.2 Kg/m^2 on a dry weight basis or approximately 0.6 Kg/m^2 on a wet weight basis.

It is further assumed that all of the fallout is retained on the plants in a pasture. This has been shown to be substantially correct for pastures (11) except for larger particles (12). Thus, except for large particles (this will be discussed subsequently), the following relationship should apply for a commercial dairy herd pasture:

$\mu Ci/Kg(forage) = \mu Ci/m^2/Kg(forage/m^2)$

Since the daily intake by a cow is nearly independent of the yield/m^2 for commercial dairys (about 9 Kg/day), the daily intake of I-131 and hence the level in milk will be inversely proportional to the Kg/m^2. This can be illustrated by the following data from the St. Louis milkshed (13):

	Fertilized Pasture	Unfertilized Pasture
Kg/m^2	0.696	0.336
pCi/m^2	552	540
pCi/Kg	794	1590
pCi/l	69	163
$pCi/m^2/pCi/l$	8.0	3.3

The assumption used in this report gives a value of 6.0 for $\mu Ci/m^2/pCi/l$. The data from the Windscale accident gives an average value of 11 for this ratio. Thus, it can be seen that the analysis in this report leads to values in the middle of this range. In fact, it agrees quite well with the St. Louis data that represent measurements within the United States on fallout from nuclear explosives.

The Small Boy Data

Knapp (14) reports values for the ratio, $\mu Ci/m^2/\mu Ci/l$, in the Alamo and Caliente, Nevada, area, following the Small Boy Test in July, 1962. These values range from 14 to 40 at Alamo with a best estimate of 30. In Caliente,

they range from 3.3 to 14 with a best estimate of 8. The Caliente data is in substantial agreement with the value of 6 in this report but the Alamo ratio is a factor of 5 higher.

There are a number of possible explanations for the wide range found for this ratio in this study both at Alamo and Caliente. One of the most convincing is that the estimates are based upon open-field gamma dose rates in the range of 0.1 mr/hr. At this range the measurement error is quite large. In addition, the pasturage in this area is quite sparse and it is reasonable to assume that many of these cows were on supplemental stored feed.

Another possible explanation for these high ratios is that the fallout was associated with larger particles that are not retained on plants (14). This could possibly account for a part of the difference at Alamo. However, at distances of 100 miles and beyond, the measured particle diameters (4) suggest that they could result in a reduction of the estimated fallout on forage by only 25%.

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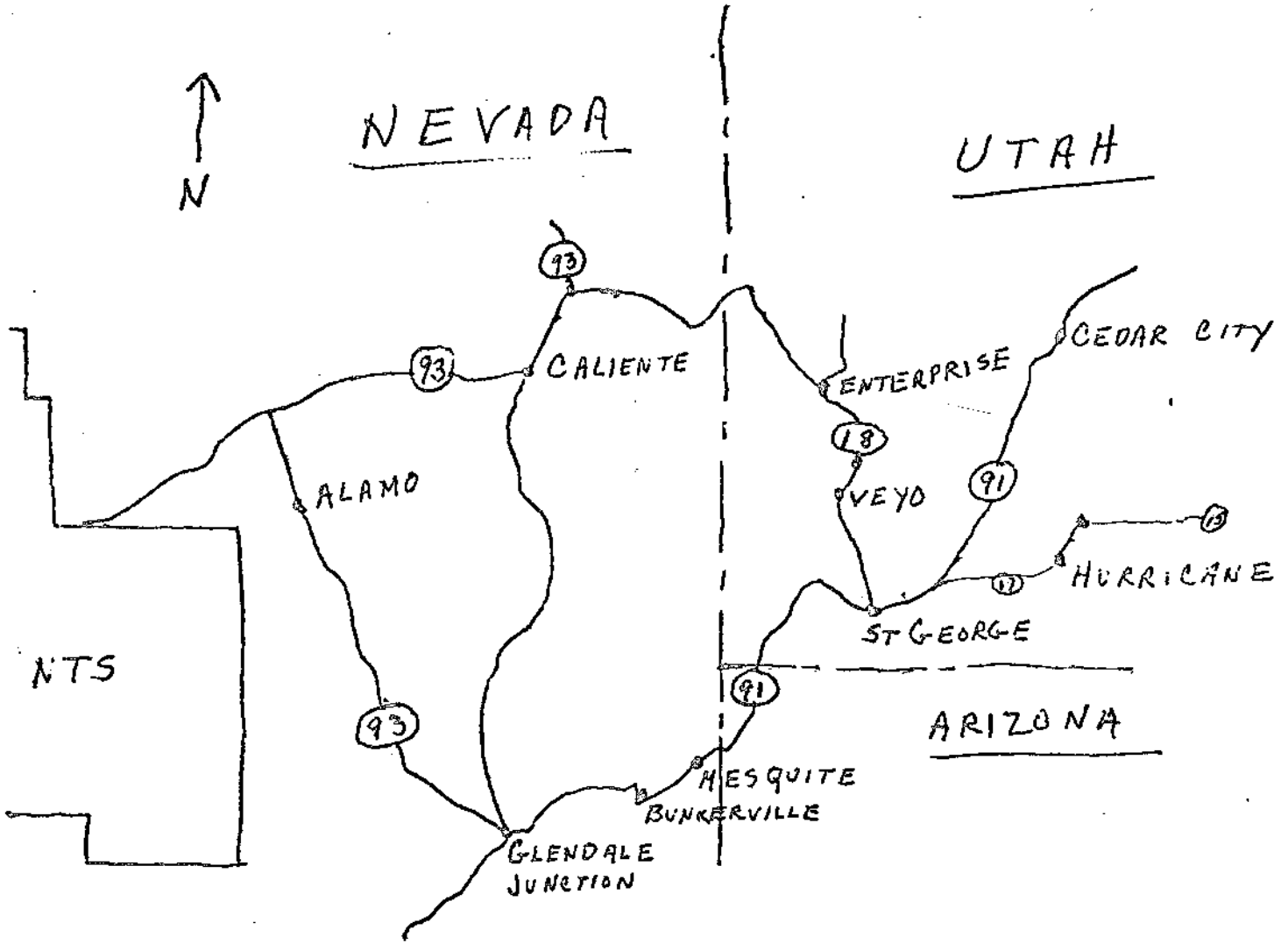

Fig. 1. Map of the Nevada-Utah area.

Table I. Off-site radiological safety data.

Sampling station	mr/hr at 24 hr
UPSHOT-KNOTHOLE SERIES	
Shot Annie (March 17, 1953)	
St. George, Utah	5.0
1 mile N. of St. George	18.0
4 miles N. of St. George	16.0
Hurricane, Utah	6.0
Shot Simon (April 25, 1953)	
Glendale Junction, Nev.	0.2
11 miles N. of Glendale Junction	4.0
13 miles N. of Glendale Junction	16.0
17 miles N. of Glendale Junction	40.0
19 miles N. of Glendale Junction	60.0
23 miles N. of Glendale Junction	40.0
30 miles N. of Glendale Junction	3.0
Bunkerville, Nev.	40.0
Mesquite, Nev.	14.0
24 miles W. of Mesquite	115.0
Shot Harry (May 19, 1953)	
Bunkerville, Nev.	1.5
Mesquite, Nev.	3.2
St. George, Utah	26.0
Hurricane, Utah	30.0
Veyo, Utah	22.0
Washington, Utah	13.0
TEAPOT SERIES	
Shot Tsela (March 1, 1955)	
St. George, Utah	1.8
Hurricane, Utah	0.8
Shot Zucchini (May 15, 1955)	
Glendale Junction, Nev.	4.0
Mesquite, Nev.	1.3
St. George, Utah	1.2

mN-15-3

[redacted]

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MAY 1962 EDITION
GSA GEN. REG. NO. 27

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: December 3, 1965

FROM : W. B. McCool, Secretary

SUBJECT: PUBLIC HEALTH SERVICE STUDY OF THYROID GLAND ABNORMALITIES

SECY:JCH

1. At Information Meeting 536 on December 1, 1965, the Commissioners requested:

a. AEC initiative regarding relief, if appropriate, to the children of St. George, Utah, reported by the Public Health Service to have thyroid abnormalities;

b. preparation of an analysis of alternatives for early consideration;

c. preparation for issuance of the facts and preparation of recommendations on the public relations aspects; and

d. preparation of interim reply to Senator Wallace Bennett's letter of November 19, 1965.

2. Commissioner Tape pointed out the need for careful coordination with other agencies.

3. It is our understanding the Assistant General Manager and the Division of Biology and Medicine are taking the required action.

cc:
Commissioners
General Manager
Deputy General Manager
Asst. General Manager
Exec. Asst. to Gen. Mgr.
Asst. Gen. Mgr. for Research & Dev.
Asst. Gen. Mgr. for Operations
General Counsel
Director, Operational Safety
Director, Biology & Medicine
Director, Public Information
Director, Congr. Relations
Director, Military Application
Controller

CONFIRMED TO BE UNCLASSIFIED
AUTHORITY: DOE - DP/OC
BY: L Hoppe DATE: 12/11/95
by: J Hahn 12/28/96

[redacted]

12-4-65

MH-S-3 [illegible]

R. E. Hollingsworth, General Manager
THRU: S. G. English, AGMRD

December 2, 1965

John R. Totter, Acting Director
Division of Biology and Medicine

THYROID STUDIES IN THE FALLOUT AREA OF UTAH BY THE USPHS

Attached for your review, and with the request that it be transmitted to the Secretariat for reproduction, is information on the above subject which was requested by Commissioner Ramey in his memorandum to you dated November 22 to be considered at an early Information Meeting. The information has been coordinated with the Division of Operational Safety.

Attachment
Information paper

cc: Dr. English, AGMRD
Secretariat (2)

* Info mtg 5-35

2.1.6.5

Md.S.3

[redacted]

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

Copy - Germantown
Reference & Reproduction Branch

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE November 30, 1965

FROM : W. B. McCool, Secretary

SUBJECT: PUBLIC HEALTH STUDY ON FALLOUT AND THYROID DAMAGE OF CHILDREN

SECY:JCH

1. At Information Meeting 535 on November 24, 1965, the Commissioners reviewed Commissioner Ramey's November 22 Memorandum regarding the recent Public Health Study on Fallout and Thyroid Damage of Children, and requested a background paper and briefing.

2. It is our understanding the Division of Biology and Medicine in coordination with the Division of Operational Safety is taking the required action.

cc:
Chairman
Commissioner Ramey
General Manager
Deputy General Manager
Asst. General Manager
Exec. Asst. to Gen. Mgr.
Asst. Gen. Mgr. for Research & Dev.
Asst. Gen. Mgr. for Operations
General Counsel
Director, Military Application
Director, Biology and Medicine
Director, Operational Safety
Director, Congressional Relations

Copy to file
Com. E. Bryson

[redacted]

11-30-65

[redacted] Mod. S 3

UNIVERSITY OF CALIFORNIA

LAWRENCE RADIATION LABORATORY
P. O. BOX 808
LIVERMORE, CALIFORNIA 94551

November 29, 1965

Dr. Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Glenn:

This letter contains a very brief summary of the analysis given me by John Gofman on the problem of possible thyroid cancer in St. George, Utah.

The estimates of dosage delivered by radioactive iodine to the thyroids of the children of St. George, Utah, who were less than five years old in 1953, vary between 500 and 2500 rads. A number of the order of 1000 rads currently appears most probable. This dosage was delivered to the thyroid by means of the milk. The dosage is estimated on the basis of yield, meteorological data and concentration in the milk and in the thyroid. Details will be given in a memo which we will send you at the end of this week.

No direct evidence seems to be available on the effect of such dosages. The data most likely to be relevant seem to be the incidence of cancer in people who were exposed as children to X-ray dosages to the thyroid of the order of 100 to 1000 rads. The quoted figures for lifetime incidence of cancer following such exposures range from 3 to 35 cases per 10^6 exposed children per rad. A figure of 15 cases per 10^6 children per rad has been used by several responsible groups.

Assuming 2000 children were exposed to 1000 rads to the thyroid, an incidence figure of 15 cases per 10^6 children per rad leads to 30 cases expected in St. George.

John Gofman cannot say, of course, that this number of cases will develop. He is well aware of the uncertainty inherent in taking an incidence figure based on X-ray dosage, where the X-rays were delivered in a hospital, at a high dose rate and not just to the thyroid but to neighboring parts of the body as well, and using it to deduce an expected incidence for similar dosages delivered to the population at large, at a lower dose rate, and by means of radioactive milk. He plans to discuss these uncertainties in his memo.

However, the possibility remains that the findings in St. George, Utah, and surrounding areas will get worse instead of better. A more detailed

11-30-65

[redacted]

[redacted]

study will clearly be needed to ascertain what the actual effects of the dosage were. John Gofman and his associates are working on the possible forms that such a study might take.

Very sincerely yours,

MMM:hrp

Michael M. May
Director
LRL, Livermore

[redacted]

M-0-5-3 Mr. McCool

Charles L. Dunham, Director
Division of Biology and Medicine

November 24, 1965

John V. Vinciguerra (Signed) John V. Vinciguerra
Executive Assistant to the General Manager

PUBLIC HEALTH STUDY ON FALLOUT AND THYROID DAMAGE OF CHILDREN

Attached is a copy of a memorandum of November 22, 1965 from Commissioner Ramey on the above subject.

At the Information Meeting this date Commissioner Ramey requested that staff brief the Commission regarding the problems set forth in the attached press clipping. Specifically, Commissioner Ramey wants to have a discussion of the merits of the allegations contained therein. He also requested that staff prepare a background memorandum which may be used as a basis for the Commission briefing. The General Manager has requested that you take the necessary action in coordination with Dr. Dunning to prepare the background information and to arrange with Mr. McCool for an appropriate briefing of the Commission.

c.c.: AGM
AGMR&D
AGMO
Secretary ✓
DGM
Cecil King

11-24-65

OFFICE ▶	EACM					
SURNAME ▶	VINCIGUERRA:dhk					
DATE ▶	11/24/65					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62701-3

mh-5-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON

November 22, 1965

MEMORANDUM FOR THE GENERAL MANAGER

SUBJECT: PUBLIC HEALTH STUDY ON FALLOUT AND THYROID DAMAGE OF CHILDREN

Attached is a copy of an article from the WASHINGTON POST which discusses a Public Health study on radioactive fallout and thyroid gland damage to children.

I would like to have this matter considered at an early Information Meeting.

J. T. R.

James T. Ramey
Commissioner

Attachment
clipping

cc: Commissioners
Secretary

11-22-65

11-15-65

Child Thyroid Victims Face Further Tests of Fallout Link

By Howard Simons
Washington Post Staff Writer

A team of medical experts has recommended that nine Utah children with thyroid gland abnormalities undergo further medical study at the Salt Lake City Medical Center.

The children are among 2000 between the ages of 10 to 18 who are being studied by the U.S. Public Health Service to determine if there is a link between fallout from atomic tests and thyroid gland damage.

In addition to the intensive hospital study of the nine children from St. George, Utah, which received a greater amount of fallout than the average American city, 18 more St. George youngsters will undergo blood tests.

No children in a companion study at Stafford, Ariz., which received less fallout than St. George, have been recommended for hospitalization yet, but 16 of the Arizona children will have their blood tested.

An informal source yesterday said that some of the Arizona children show thyroid abnormalities, too. Hospital study of these youngsters, he said, seems likely.

The recommendations for hospital studies and blood tests came from three thyroid gland experts sent to the two cities by the Public Health Service after preliminary findings showed a disproportionate number of thyroid abnormalities in the Utah children.

The specialists are Dr. Brown M. Dobyns of Western Reserve Medical School, Dr. Raymond F. Keating Jr., of the Mayo Clinic, and Dr. Joseph E. Rall of the National Institutes of Health. They have not yet made their formal report to PHS but it is expected to contain further recommendations for the Government's fallout-thyroid study.

The thyroid gland is particularly likely to get a large dose of radiation from fallout, especially from radioactive iodine for which the gland has an affinity.

In recent years, atomic experts have accumulated disturbing information linking radioiodine, which falls out shortly after an atmospheric atomic test, with thyroid abnormalities.

The most recent of these findings is a continuing study of Marshall Islanders accidentally bathed in large amounts of fallout in March 1954. The incidence of thyroid abnormalities among the affected Islanders has been climbing at a significant rate.

Though no such link or incidence has yet been established for American children who have absorbed radioactive iodine in food and drink, scientists have virtually no information on these possibilities.

WALLACE F. BENNETT
UTAH

TOM C. KOROLOGOS
ADMINISTRATIVE ASSISTANT

MHoS-3

United States Senate

WASHINGTON, D.C. 20510

COMMITTEES:
FINANCE
BANKING AND CURRENCY

JOINT COMMITTEES:
ATOMIC ENERGY
DEFENSE PRODUCTION

SELECT COMMITTEE:
STANDARDS AND CONDUCT

November 19, 1965

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

Dear Glenn:

As you know, the Public Health Service has been conducting a series of tests on Utah children with apparent thyroid gland abnormalities. They are among 2,000 between the ages of ten and eighteen who are being studied by the Health Service to determine whether there is a link between fallout from atomic tests and thyroid gland damage.

Current plans call for intensive hospital study of some nine or ten children from St. George, Utah. The Public Health Service has assigned a number of thyroid gland experts to the study in addition to the many administrators and other technicians necessarily involved. This excellent effort by the Health Service is obviously taxing its budget authorized last Congress.

In an effort to eliminate any appropriation problems which might arise and which might hamper the testing program, I am wondering if there is a possibility for the Atomic Energy Commission to earmark and transfer a total $1 million to the Public Health Service so that it can continue this program. The funds would be used to start the study in fiscal year 1966 and I am fairly certain there will be additional appropriations sought when the next budget reaches us. I am informed that in addition to studying the children involved in the intensive diagnostic work at the Utah Medical Center a possibility of treatment also exists which also is going to cost money and come from the Health Service budget.

Any assistance or information you can provide me on this matter will be appreciated.

Kindest personal regards,

Sincerely,

Wallace F. Bennett

WFB:ta
cc: G.D. Carlyle Thompson, M.D.
Surgeon General William H. Stewart

11-19-65

7M4.S-2

HARDY—WO 3-4949

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
Washington, D.C. 20201

FOR RELEASE IN A.M. PAPERS
Thursday, October 28, 1965

HEW-H25

A progress report on a study of thyroid conditions in approximately 2,000 Washington County, Utah, school children and a group of about 1,400 students in Graham County, Arizona, was given Wednesday by Dr. G. D. C. Thompson, Utah State Health Director, at a regular meeting of the Utah State Board of Health. The report was made public simultaneously by the Public Health Service, U.S. Department of Health, Education, and Welfare, which is conducting the study in cooperation with the State.

The study is part of a long-term investigation to determine whether a statistically meaningful relationship might exist between certain health defects, which may occur naturally, and exposures to radiation. The information being gathered includes such data as family history of thyroid abnormalities; residence history; and exposure to medical and dental radiation as well as exposure to fallout from the Nuclear Test Site in Nevada which might have been received in the 1950s.

The report is as follows:

> Preliminary physical examinations of the thyroid glands of students in both communities by a team of physicians organized by the Public Health Service began September 17, 1965, and were completed October 11. Each student was examined independently by three physicians.
>
> At least one physician in each instance was of the opinion that thyroid nodules or small lumps, might be present in 70 of the Utah students and in 25 of the Arizona group.
>
> The data are not yet complete enough to warrant drawing any conclusions from the apparent difference in the incidence of nodules in the two groups. Nor do we have any statistical data on the incidence of thyroid nodules in the general population.
>
> A panel of three nationally recognized medical experts on the thyroid gland has been appointed to conduct further study on the 95 cases.

Commenting on the progress report, Surgeon General William H. Stewart of

(More)

the Public Health Service made the following statement:

"In this preliminary phase it is not possible to assess the medical significance of these findings. We need to determine first, the significance of the thyroid nodules which may be present; and second, what further diagnostic or therapeutic procedures are indicated.

"Among the abnormalities which may be associated with thyroid nodules are non-toxic goiter, inflammatory diseases of the thyroid, and either benign or malignant tumors."

Dr. Stewart said the Public Health Service has called together a panel of nationally known medical authorities on the thyroid gland for further study of the two groups. They will determine whether further diagnostic procedures are required. Family physicians, parents and health authorities will be advised concerning each individual situation.

Members of the panel are: Dr. Raymond F. Keating, Jr., Mayo Clinic; Dr. Brown M. Dobyns, Cleveland General Hospital; and Dr. Joseph E. Rall, National Institutes of Health.

The Surgeon General said it would be difficult to ascribe a definitive cause to any thyroid abnormalities found in the study since thyroid irregularities may occur naturally and information about the patterns of their occurrence is inadequate.

"For this reason additional information remains to be collected. This will include: the history of goiter among families of the students; the history of their residence during the 1950s; dietary habits; present medical status with particular reference to endocrine disorders; and history of radiation exposure of any sort, including medical diagnosis or treatment, or fallout.

"Because of the lack of information about the normal incidence of thyroid abnormalities such as nodules, definitive conclusions cannot be drawn. To help fill this gap and provide baseline information we are undertaking similar studies of the thyroid in other communities."

# # #

Mid-S. 3

OCT 2 7 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER CAPP

SUBJECT: PHS ANNOUNCEMENT ON THYROID STUDIES IN NTS AREA

Public Health Service amended the last paragraph of subject announcement which I sent you today. The last paragraph should read as follows:

> "Because of the lack of information about the normal incidence of thyroid abnormalities such as nodules, definitive conclusions cannot be drawn. To help fill this gap and provide base line information, we are undertaking similar studies of the thyroid in other communities."

Signed
Duncan Clark

Duncan Clark, Director
Division of Public Information

cc: S. E. Hollingsworth, General Manager

bcc: Dwight Ink, AEC
H. C. Brown, AEC
B. English, AEC
H. J. Black, DOH
J. Parks, OGR
M. B. Nichol, NTO
C. L. Dunham, DOH
Gordon Dunning, GS

10-27-65

MH.S-3

OCT 27 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: PHS ANNOUNCEMENT ON THYROID STUDIES IN NTS AREA

Attached for your information is a copy of an announcement on the above subject which will be issued by the Public Health Service for release at 4 p.m. EDT today. PHS advises us that the announcement has been approved by the White House.

PHS will hold a background briefing at 1:30 p.m. today for about 10 newsmen who cover the agency regularly. The briefing will be conducted by the Surgeon General and Dr. Chadwick, Chief of the PHS Division of Radiological Health. We are advised that this briefing was requested by the White House. We will have an observer there.

The release time will coincide with a meeting of the Utah State Board of Health in Salt Lake City, at which the Utah State Health Officer will report on the status of the thyroid study. This meeting will be attended by news media representatives.

We anticipate questions from newsmen following the issuance of the material by PHS. We do not intend to comment on the health implications of the study, beyond pointing out that the PHS announcement indicates that it is too early to draw any conclusions. We plan to answer questions regarding the radiation history of the St. George area, drawing from material that has been released in the fallout hearings and elsewhere.

Duncan Clark, Director
Division of Public Information

Attachment

cc: R. E. Hollingsworth, General Manager

bcc: Dwight Ink, AGM
H. C. Brown, AGMA
S. English, AGMRD
E. J. Bloch, DGM
J. Burke, OGR
W. B. McCool, SECY
C. L. Dunham, B&M
Gordon Dunning, OS

OFFICE ▶	PI				
SURNAME ▶	DClark:mha				
DATE ▶	10/27/65				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62701-3

OCT 2 7 1965

A progress report on a study of thyroid conditions in approximately 2000 Washington County Utah school children and a group of about 1400 students in Graham County Arizona was given today by Dr. G. D. C. Thompson, Utah State Health Director, at a regular meeting of the Utah State Board of Health. The report was made public simultaneously by the Public Health Service, U. S. Department of Health, Education and Welfare, which is conducting the study in cooperation with the state.

The study is part of a long-term investigation to determine whether a statistically meaningful relationship might exist between certain health defects, which may occur naturally, and exposures to radiation. The information being gathered includes such data as family histories of thyroid abnormalities; residence histories; and exposure to medical and dental radiation as well as exposure to fallout from the nuclear test site in Nevada which might have been received in the 1950's.

The report is as follows:

> Preliminary physical examinations of the thryoid glands of students in both communities by a team of physicians organized by the Public Health Service began September 17, 1965 and were completed October 11. Each student was examined independently by three physicians.
>
> At least one physician in each instance was of the opinion that thryoid nodules or small lumps, might be present in

70 of the Utah students and in 25 of the Arizona group.

The data are not yet complete enough to warrant drawing any conclusions from the apparent difference in the incidence of nodules in the two groups. Nor do we have any statistical data on the incidence of thryoid nodules in the general population.

A panel of three nationally recognized medical experts on the thryoid gland has been appointed to conduct further study on the 95 cases.

Commenting on the progress report, Surgeon General William H. Stewart of the Public Health Service made the following statement:

"In the preliminary phase it is not possible to assess the medical significance of these findings. We need to determine first, the significance of the thryoid nodules which may be present; and second, what further diagnostic or therapeutic procedures are indicated.

"Among the abnormalities which may be associated with thyroid nodules are non-toxic goiter, inflamatory diseases of the thryoid, and either benign or malignant tumors."

Dr. Stewart said the Public Health Service has called together a panel of nationally-known medical authorities on the thryoid gland for further study of the two groups. They will conclude their study in mid-November and will determine whether further diagnostic procedures are required. Family physicians, and parents and health authorities

will be advised concerning each individual situation.

Members of the panel are: Dr. Raymond F. Keating, Jr., Mayo Clinic; Dr. Brown M. Dobyns, Cleveland General Hospital; and Dr. Joseph E. Rall, National Institutes of Health.

The Surgeon General said it would be difficult to ascribe a definitive cause to any thryoid abnormalities found in the study since thryoid irregularities may occur naturally and information about the patterns of their occurrence is inadequate.

"For this reason additional information remains to be collected. This will include: the history of goiter among families of the students; the history of the residence during the 1950's; dietary habits; present medical status with particular reference to endocrine disorders; and history of radiation exposure of any sort including medical diagnosis or treatment, or fallout.

"Because of the lack of information about the normal incidence of thryoid abnormalities such as nodules, definitive conclusions cannot be drawn. To help fill this gap and provide base line information, we are investigating the possibility of conducting similar studies of the thryoid in other communities."

###

M-5-3

NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS

4000 BRANDYWINE STREET, N. W.
SUITE 604
WASHINGTON, D. C. 20016

LAURISTON S. TAYLOR, PRESIDENT
SHIELDS WARREN, VICE PRESIDENT
W. ROGER NEY, EXECUTIVE DIRECTOR

October 19, 1965

NCRP

Dr. Glenn T. Seaborg
Chairman
United States Atomic Energy Commission
Washington, D.C. 20545

Dear Dr. Seaborg:

Dr. Taylor has asked me to reply to your letter of September 29, 1965 accepting collaborating status with the NCRP. First, let me say that we are very pleased that the United States Atomic Energy Commission has decided to enter into this relationship with the Council. I hope it will provide an effective mechanism for developing the type of relationship which the National Committee enjoyed in the past.

To perfect this relationship in accordance with the Council's policy, I am enclosing a list of the present members of the Council and would like to ask you to designate one or more NCRP members whom we might ask to help in maintaining liaison between the Atomic Energy Commission and the NCRP. I also would appreciate it if you would designate the Atomic Energy Commission personnel who will be concerned with liaison between the two organizations.

In implementation of the Council's policy, and as the first step in keeping the Atomic Energy Commission informed of NCRP activities, I am enclosing a copy of the NCRP Annual Report for 1964. You will be receiving other materials about our program from time to time. Also, on the occasion of the next membership election, we will request suggestions regarding individuals who might be considered for election to membership in the Council.

Again, let me say that we are pleased to have the United States Atomic Energy Commission among the collaborating organizations of the NCRP and look forward to a rewarding relationship.

Sincerely yours,

W. Roger Ney

W. Roger Ney
Executive Director

WRNey/egm
Encs.

10-19-65

NCRP

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(The Members are also members of the Board of Directors)

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UNCLASSIFIED

October 14, 1965

AEC 604/91

COPY NO. 26

AEC 604/91

ATOMIC ENERGY COMMISSION

USPHS SURVEY OF SCHOOL CHILDREN FOR THYROID TUMOR AND DENTAL ANOMALIES

Note by the Assistant Secretary

1. The attached report and memorandum of October 12, 1965 from the Director of Biology and Medicine are circulated for the information of the Commission at the request of the Executive Assistant to the General Manager. It is our understanding that the Surgeon General may address a letter to the AEC on this matter shortly.

2. At Information Meeting 517 on September 10, 1965, the Commissioners discussed Mr. Ink's September 9, 1965 memorandum, on USPHS Studies in Utah which included as Tab "B" a proposed study on "Environmental and Genetic Factors in the Oral Dental and Medical Characteristics of Utah School Children".

F. T. Hobbs

Assistant Secretary

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10-14-65

ATTACHMENT I

REPORT ON
USPHS SURVEY OF SCHOOL CHILDREN IN ST. GEORGE, UTAH
AND SAFFORD, ARIZONA FOR THYROID TUMOR AND
DENTAL ANOMALIES

- Charles L. Dunham, M.D.

1. On October 4, 1965, I received the following information by telephone from Dr. D. R. Chadwick, Director, Division of Radiological Health, Bureau of State Service, USPHS: On the first go around of two teams of three doctors each at St. George there were 40 individuals tagged as having palpable nodules. At Safford eight were so-tagged. This meant that two out of three members of the team believed they were able to feel one or more nodule. A consensus study has since been done at St. George which means that the 40 individuals were all re-examined by each of the six physicians, and a consensus agreed in 17 instances that nodules were present. Seventeen of these instances were in children and one in a 30-year old female who had only moved to St. George within the past year. The residence history in St. George is complete and indicates that 12 of 17 children have a family history of goiter. In none of the children is there a history of thymus trouble. One of the children had had a foreign body in the bronchus which required fluoroscopy. Nine of the children have lived all their lives in St. George; seven others lived all their lives in Utah, and one lived the past seven years in St. George, presumably coming from out of the State though my notes are not clear on this point.

2. There is no further information on the Safford Study at present beyond the eight children identified in the first go around.

3. Dr. Chadwick was recommending to the Surgeon General three possible courses of action but urging the last of the three. This is in view of the fact that local physicians on the teams and representatives of Dr. Rall's group at NIH are urging and quite properly that a number of these youngsters have their nodules biopsied. It isn't contemplated that all would be biopsied. Alternate #1 is to say nothing publicly but go ahead and admit to the hospital for biopsy under the auspices of USPHS; (2) make no announcement but be prepared to respond to inquiries from the press if they come in (it is a very good conclusion that the press will become aware of the biopsies in the near future); (3) statement to be given out in advance before the children are to be admitted to the hospital, indicating that the follow-up study is continuing and some children have turned up with nodules and USPHS has made appropriate diagnostic procedures available. Information received by Mr. Clark, DPI, October 8, indicates that the Surgeon General has decided on the 2nd alternative.

4. It is my understanding that under no circumstances will the number of children involved be given out at this stage of the game. It is my further understanding that AEC will be advised formally of the Surgeon General's action within the next few days by the Surgeon General.

Attachment I

ATTACHMENT II

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D. C.

October 12, 1965

MEMORANDUM

TO : John V. Vinciguerra, Executive Assistant to GM

FROM : Charles L. Dunham, M.D., Director, DBM

SUBJECT: USPHS SURVEY OF SCHOOL CHILDREN IN ST. GEORGE, UTAH AND SAFFORD, ARIZONA FOR THYROID TUMOR AND DENTAL ANOMALIES

The eight questionable cases in Safford, Arizona, have been reexamined by all six physicians (See previous memo dtd 10/4/65),* and in none was there a consensus so these eight have essentially dropped to zero.

One further step is now planned by USPHS. All 40 individuals at St. George and all eight at Safford will be examined by a three-man specialist team composed of Dr. Rall, NIH; Dr. Keating, Mayo Clinic; and Dr. Brown Dobyns, Cleveland General Hospital; all well qualified experts, in my opinion. They will be accompanied by someone chosen by the Utah medical people as an appropriate representative of Utah medicine. There is still no plan for a press statement and the whole thing is being played quietly and in a relatively low key.

*Secretariat Note: Revised and submitted as Attachment I.

MH+S-3
Radiation

October 11, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER BARLY
COMMISSIONER TAPE

(Signed) John V. Vinciguerra for

THROUGH GENERAL MANAGER

SUBJECT: RECENT INFORMATION ON THYROID DISEASE IN THE MARSHALLESE ISLANDS

Dr. Robert A. Conard of the Medical Department, Brookhaven National Laboratory, has just returned from an interim visit to the Marshall Islands to check on possible further development of thyroid abnormalities in the Rongelapese accidentally exposed to fallout on March 1, 1954. He was accompanied by Dr. J. E. Rall, a consultant thyroid specialist of the National Institutes of Health.

It will be recalled that, as of mid-summer, benign nodules had been found in a total of five adolescents exposed at ages of two to seven years; one adult female, forty-one years old, had been found to have a malignant nodule. All successfully underwent surgery for removal of the abnormal tissue. Attached is a copy of our July 12, 1965, memorandum to you describing the successful surgery for two children and the adult.

During the current August examination, nodules were found in three additional adolescents and two adults. The contours of the thyroids of two more adolescents, two young adults, and one was approaching middle age were sufficiently different from normal to cause Drs. Conard and Rall to describe them as questionable.

To summarize, there are now eleven of eighty-two Marshallese with definite abnormalities of their thyroid tissues and five more are considered questionably so.

10-11-65

The non-exposed control population continues to be free of nodular thyroid disease. This extremely high incidence of thyroid disease in the exposed population must be considered the result of their exposure to fallout. Dr. Conard and his group will return to Rongelap in February 1966. Meanwhile, therapy with synthetic thyroid hormone has been instituted in an effort to control further nodule formation. Surgery is being arranged for the five new cases of nodular thyroid disease.

You will be kept informed as this develops further. Obviously, there are many aspects to these findings which will excite both medical and lay interests.

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

Attachment:
Memo dated 7/12/65

cc: GM (2)
Sacy (2)
AGMRD
BMA
ADMBR

BMA ADA

10/10/65 HAStannard 10/ /65

ADMBR DIRECTOR AGMRD GM

HDBruner:pwg CLDunham
10/10/65 10/ /65 10/ /65 10/ /65

July 12, 1965

MEMORANDUM FOR: CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

THROUGH GENERAL MANAGER

SUBJECT: THYROID DISEASE IN RONGELAP ISLANDERS

During the week of July 5, 1965, the three Rongelapese who were brought to this country for study at Brookhaven National Laboratory were operated on at the Lahey Clinic, Boston. You will recall that thyroid tumors were noted at the 1965 medical examination of those exposed to fallout in March 1954 from the Bravo Test.

The two teen-age boys were found to have each a solitary benign tumor of the thyroid. These nodules were removed surgically. The middle-aged woman was found to have a carcinoma of the thyroid gland with some metastases to local structures. A subtotal thyroidectomy was carried out. In her case, the prognosis is fair. She will be given 30 millicuries of Iodine-131 therapeutically to destroy persisting thyroid tissue.

It is interesting that the dose of radioiodine to the thyroid gland in the case of the woman is estimated at about 160 rads, or approximately one-tenth that to the glands of the youths. Presently under consideration is theadministration of dessicated thyroid tablets prophylactically to all the Rongelapese who were at Rongelap or Alinginae at the time of fallout.

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

sent to L 7/14/65

cc: Secretariat (2)
GM
AGM/RD
BMA

BM DIRECTOR AGM/RD GM
DUNHAM:RMB
7/12/65

D/C Stay Rooney

MH.S-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

SEP 29 1965

Dear Dr. Taylor:

Thank you for your letter of September 13, 1965 inviting the United States Atomic Energy Commission to become one of the Collaborating Organizations of the National Council on Radiation Protection and Measurements.

On behalf of the Commission, I am glad to accept the invitation, and anticipate that the new relationship will be as profitable as was the old.

Sincerely yours,

/s/ John G. Palfrey
Chairman

Dr. Lauriston S. Taylor, President
National Council on Radiation
Protection and Measurements
4000 Brandywine Street, N. W.
Washington, D. C. 20016

Distribution:

Chairman	(2)
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9-29-65

SEP 24 1965

Honorable Otto E. Passman
House of Representatives

Dear Mr. Passman:

This is in reply to your letter dated August 24, 1965, concerning a letter dated August 17, 1965, to you from the Honorable George S. Holstead, House of Representatives, State of Louisiana. Mr. Holstead wrote you on behalf of a resident of Louisiana who was concerned about a luminous dial wristwatch that he possessed.

After discussing the matter with Miss Addison of your office, we contacted Mr. Holstead and were able to obtain the watch from its owner, Mr. LeVasseur, for the purpose of conducting some routine tests. The results of these tests are summarized in the enclosed letter dated September 9, 1965, to Mr. LeVasseur from Mr. Davis of our Atlanta office. In summary, these tests confirmed that the watch had a radium dial and that the radiation was not in excess of that from most radium-dial watches.

We hope that the foregoing information will be helpful in your response to Mr. Holstead.

Sincerely yours,

Original signed by R. D. O'Neill

Robert D. O'Neill
Acting Director
Congressional Relations

Enclosure

bcc: J. Burke, CR (2), w/encl
Secretariat (2), w/encl
H. L. Price, REG, w/encl
H. K. Shapar, GC, (2), w/encl
F. Western, SS, W/encl
J. G. Davis, CO:II, w/o encl
REG Reading File, w/encl
J. Shafer, REG, w/encl

CO Rewrite:OCR

JRRoeder:cs RDO'Neill:bw

9/20/65 9/24/65

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C
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P
Y

In Reply Refer To:
CO:II:JGD

September 9, 1965

Mr. F. O. LeVasseur
County Agent, Lincoln
Bisgeneau Street
Ruston, Louisiana

Dear Mr. LeVasseur:

Under separate cover I am returning your Hamilton wrist watch in the same condition as it was received. It was not necessary to destroy any of the parts to determine the radioactivity on the face and hands. It was determined that your watch contains radium which is a naturally occurring radioactive material and is not under the jurisdiction of the Atomic Energy Commission.

Our measurement of the watch revealed that the radium on its face and hands emits radiation in an amount that is usual from luminous wrist watches containing radium. Your watch measured 0.004 roentgens per hour at the face with the watch intact. On the back the measurement was 0.0002 roentgens per hour. Radiation levels of 0.005 to 0.010 roentgens per hour from radium-containing luminous dials are quite common. Such watches containing radium have been in general use since 1914.

It has been estimated that a person wearing a luminous dial watch containing the usual amount of radium receives an exposure of about 4.5 rems per year to the wrist. This compares to 75 rems per year to the hands and forearms recommended as a limit for radiation workers. (Rem is an abbreviation for "roentgen equivalent man" and is the unit used to express human biological doses as a result of exposure to radiation.)

The radiation levels from a typical radium dial watch are within limits considered acceptable. However, whether the potential risk involved in the continual wearing of a radium dial watch outweighs

the advantages thereof is, of course, a personal decision. Many of the best informed people in the field of radiation protection continue to wear such watches even though they may make minimal use of the luminescent properties.

I hope this information is useful to you. If you have questions regarding this matter, please contact me.

Very truly yours,

/s/ J. G. Davis

John G. Davis
Director

MH.S.3 Rpg / Walsh-Healy 2

September 20, 1965

MEMORANDUM OF APPOINTMENT - Dr. Seaborg with James J. Reynolds, Administrator, Labor-Management Services Administration, Dept. of Labor; Clarence T. Lundquist, Administrator, Wage and Hour and Public Contracts Divisions, Dept. of Labor; William Lowe, Dept. of Labor - September 15, 1965, 3:00 p.m., Chairman's Conference Room, Washington, D. C.

AEC Participants:
Dr. Seaborg
Dr. Tape
Mr. Bloch
Mr. Hennessey
Mr. Price
Mr. Rubin

The meeting was held on September 15 with the above present to review with the Department of Labor our interest in avoiding any duplication of efforts between our two organizations in evaluating qualification of states to conduct inspections in the nuclear area under Walsh-Healy. Mr. Price explained that states had expressed some concern over both the duplication of effort and possible conflicting opinions and standards that may be issued if both the AEC and the Department of Labor issued separate rulings on their qualification.

The Department of Labor representatives indicated some concern over complete abdication of their responsibility to act as spokesman for Labor in any situation that may arise involving inspection in the nuclear area by states. While they had every intention of accepting AEC judgment on a states qualification in this area they appeared reluctant to acknowledge formally that this practice would always be followed.

The question of evaluating a states capability in connection with use of X-ray equipment and radium was raised since neither of these two fell under the jurisdiction of the AEC.

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PPC-1-1 Reg agrees with State

There appeared to be a good understanding of each organization's position and it was finally concluded that the General Counsel of both Agencies should meet and try and develop language for any regulations the Department of Labor might issue that would satisfy both groups' interests. The eventual language adopted and any other significant details to complete the record of this meeting will be supplied in a separate memorandum from Mr. Price.

/s/

Julius H. Rubin
Staff Assistant
to the Chairman

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

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Res. & Status Br. - D.Col

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: September 15, 1965

FROM : W. B. McCool, Secretary

SUBJECT: USPHS EPIDEMIOLOGY STUDIES IN SOUTHWEST UTAH

SECY:JCH

1. At Information Meeting 517 on September 10, 1965, the Commissioners discussed briefly proposed changes in the draft letter to Dr. Luther Terry and agreed staff may proceed as proposed in Mr. Ink's September 9 memorandum to the Commissioners with attachments.

2. It is our understanding the Assistant General Manager is taking the required action.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Exec. Asst. to Gen. Mgr.
Asst. Gen. Mgr. for Research and Development
General Counsel
Director, Operational Safety
Director, Biology and Medicine

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MHS-3

NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS

4000 BRANDYWINE STREET, N. W.
SUITE 604
WASHINGTON, D. C. 20016

LAURISTON S. TAYLOR, PRESIDENT
SHIELDS WARREN, VICE PRESIDENT
W. ROGER NEY, EXECUTIVE DIRECTOR

NCRP

September 13, 1965

Dr. Glenn T. Seaborg
Chairman
United States Atomic Energy Commission
Washington, D.C. 20545

Dear Dr. Seaborg:

When the National Council on Radiation Protection and Measurements was created as the federally chartered successor to the National Committee on Radiation Protection and Measurements, it was recognized that the corporate nature of the Council required a modification of the relationships which had grown up between the National Committee and the many organizations which supported its work. Thus, immediately after the organization of the Council a study was begun of the policy to be followed in regard to such organizations. This study resulted in (1) the creation of a category of "Collaborating Organizations", and (2) the formulation of a policy designed to foster fruitful relationships with these organizations. I am pleased to report that in implementation of the policy thus established the Council has determined to invite the United States Atomic Energy Commission to become one of the Collaborating Organizations of the NCRP.

I am enclosing a copy of a statement which summarizes the Council's policy on collaborating status. You will note that this policy seeks to continue the productive organizational relationships which the NCRP has enjoyed in the past, but also recognizes the delineation of responsibility for organization actions which is required by the corporate nature of the Council. I believe that under this policy the United States Atomic Energy Commission and the Council should be able to continue and, in fact, improve upon the rewarding relationship which our organizations have enjoyed in the past. If you concur, I will be happy to take the steps necessary to implement this policy in accordance with the provisions set out in the statement.

Sincerely yours,

Lauriston S. Taylor

Lauriston S. Taylor
President

LST/egm

Enc.

9-13-65

Policy of the National Council on Radiation Protection and Measurements with regard to Collaborating Organizations

The Charter of the National Council on Radiation Protection and Measurements (NCRP) sets out as one of the Council's objects and purposes the following:

> "to provide a means by which organizations concerned with the scientific and related aspects of radiation protection and of radiation quantities, units, and measurements may cooperate for effective utilization of their combined resources, and to stimulate the work of such organizations."

The Bylaws of the NCRP define collaborating organizations of the NCRP as "organizations or groups of organizations, of national or international scope, concerned with scientific problems involving radiation quantities, units, measurements and effects, or radiation protection." The Bylaws provide that the Board of Directors of the NCRP may from time to time confer collaborating status on appropriate organizations and may remove from such status organizations previously given collaborating status. Normally only organizations having a professional membership and of a non-profit type are considered for such status.

The purpose of the various Charter and Bylaw provisions is to make possible the establishment between the Council and other organizations the same type of fruitful and mutually beneficial relationship which the National Committee on Radiation Protection and Measurements so long enjoyed with the various organizations interested in its program. The corporate nature of the Council necessitates a relationship between the Council and other organizations which is somewhat different from that which evolved during the active life of the "Committee." However, the purpose of such relationships remains the same, namely, worthwhile cooperation among the various groups concerned with radiation matters.

To facilitate this purpose, the Bylaws of the NCRP specify that collaborating organizations shall be kept generally informed of the activities of the Council. Also the Board of Directors of the NCRP is empowered to solicit advice from collaborating organizations on NCRP programs or projects. Finally, the Bylaws specify that collaborating organizations shall have the opportunity upon request to submit suggestions on individuals to be considered by the NCRP for election to the membership of the Council. The corporate nature of the Council, however, requires that election of members be vested in the NCRP and that members serve in their individual capacities rather than as representatives of another organization. This does not prohibit election of members on the recommendation of a collaborating organization, and it is expected that many members of the Council will be selected on this basis.

Liaison between the Council and collaborating organizations will be handled as follows. Each collaborating organization will be informed of the current membership of the Council. The collaborating organization will then be asked to designate a Council member who is also a member of the collaborating organization to provide liaison between the two organizations by bringing to each information about the programs and problems of the other.

The policy outlined above will be implemented as follows:

1. Invitations to accept collaborating status will be directed to organizations selected by the Board of Directors of the NCRP.

2. On acceptance of an invitation to become a collaborating organization, an organization will be asked to suggest individuals who might be considered for election to the membership of the Council. (Note that term of membership is as specified in the Bylaws of the NCRP and that individuals elected on the recommendation of a collaborating organization do not serve as representatives of that organization.)

3. Collaborating organizations will be asked to designate a common member to provide liaison between the two organizations.

4. Should an individual decline to provide liaison, or should the liaison activities of a member of the Council be terminated for any reason, the collaborating organization involved will be asked to designate another common member who might be asked to serve in a liaison capacity.

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Radiation
RAD HEALTH

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

SEP 10 1965

Honorable Luther L. Terry
Surgeon General
U. S. Public Health Service
Department of Health, Education
and Welfare

Dear Dr. Terry:

This is by way of follow-up on the meeting of September 2, 1965 between Mr. Nak, Dr. Dunham and Dr. Dunning of our staff with Allen M. Pond, Dr. Chadwick and others from the Department of Health, Education, and Welfare and representatives of the Office of Science and Technology and the Federal Radiation Council.

The meeting concerned a draft report entitled "Leukemia Mortality in Southwestern Utah" by Mr. Edward Weiss, a proposed study "Environmental and Genetic Factors in the Oral Dental and Medical Characteristics of Utah School Children" and a draft press release on these studies. We appreciate very much having had the opportunity to review these documents along with the proposal for the extension of the studies.

As to the Weiss draft report, you will note that as indicated by the Atomic Energy Commission staff comments, we have a number of problems with it. We hope that in its review of the document the Public Health Service will bring to bear all the broad experiences in epidemiology of its National Institutes of Health and its Communicable Disease Center in Atlanta. The attached comments by AEC staff scientists are offered for your consideration. As was agreed at the meeting, the Commission would appreciate learning the degree of variance among groups of 20,000 children, in small population groups, around the country in relation to the national average. These data might assist in placing the Utah statistics in perspective.

We wish to assure you that, as in the past, we are in favor of epidemiological studies in Southern Utah, and the AEC wishes to cooperate fully in any efforts that will clarify the effect or noneffect of radiation exposure from fallout. You will note by our staff comments (attached), however, that there are rather serious reservations in their minds that the proposed studies will produce unequivocal data. At this point in time it is not clear that a proposal of

9-10-65

modification of the study would be fruitful. We do urge that the investigators exercise due caution in placing the study in proper perspective when presenting it to the public.

Mr. Duncan Clark and Mr. Judson Hardy of our respective staffs are currently working on the wording of the press release attempting to minimize unwarranted concern among the school children and their parents.

Sincerely yours,

Assistant General Manager

Attachments:
1. AEC Comments on "Environmental & Genetic Factors, etc."
2. AEC Comments on "Leukemia Mortality, etc."

cc: Hon. Donald F. Hornig
Office of Science and Technology
Paul C. Tompkins, Exec. Dir.
Federal Radiation Council

COMMENTS ON "Environmental and Genetic Factors in the Oral Dental and Medical Characteristics of Utah School Children"

1. If persons had continued to live in the areas of Utah indicated in the study, they would have received in general, two to four roentgens of total exposure from all fallout since tests began in Nevada in 1951. During the period of major atmospheric testing in Nevada (1951-1958) the guidelines of the International Commission on Radiological Protection and the National Committee on Radiation Protection for normal nuclear operations was 1-1/2 roentgens per year to individuals. Later this was reduced to 1/2 roentgen per year but in doing so the Commission and Committee carefully pointed out that such reduction was not based on evidence of biological damage, but rather constituted a more conservative approach to establishing radiation guides.

2. It is correct that most of the total exposure in the stated areas in Utah occurred within a few months during 1953. This does not alter the conclusion implied in the first comment that persons exposed to two to four roentgens (delivered within a few months) would not constitute a profitable group to study for radiation effects. What these data do clearly show, however, is the need to look at a specific population group. For examples:

   a. Children conceived after this period of time did not receive the radiation exposure.

   b. It will be necessary to check quite accurately the location of the subject in the specific 1953 time period. This is further complicated by the fact that the fallout patterns were quite sharp, i.e., potential radiation exposures from the center line of the patterns outward decreased greatly over just a few miles and even within the pattern there were variances. If the subject was not present in the specific areas at the pertinent time, he should not be considered in the study. Contrariwise, those who were present at the time of the fallout and moved to other areas afterwards must be located and examined. It would not be justifiable to assure that these two factors cancel each other. These facts, of course, raise difficulties in the performance of the studies, but are essential if there are any hopes of reaching sound conclusions.

3. The number of subjects involved is so exceedingly small, for these types of studies, that results can be statistically suspect even before obtaining them. Statistical manipulation of data has validity up to a point but no such operations are proper substitutes for inadequate input data. Wide variations may be expected in the effects sought, among groups of 2000 children in the country. Although there has been an attempt to find a comparable control group, the proposal does not give adequate assurance that this has been accomplished.

and even if so, the small number of cases involved would militate against unequivocal data.

It is also noted that some of the possible effects are to be determined by subjective criteria. If this be necessary, the requirement for an adequately designed study is all the more imperative.

4. Some additional uncertainties concerning the validity of the background data and information used by the proposal are:

   a. The proposal submits as its first argument, in its Introduction, that the relatively high concentration of fallout debris in the air constitutes evidence of high external radiation exposures. It has been repeatedly shown that for the cases of fallout in question the whole body exposure resulted after the material was deposited on the ground. Further, relationships between concentrations of radioactive debris in the air and that deposited on the ground have not been established.

   b. The proposal states " . . . 3 curies would be retained in the body." This is a generalized statement which may lead to false assumptions. The fallout debris from Nevada tests has been found to be in general very insoluble, at least in the nearby areas, thus the lung would be the critical organ. The estimated lung dose from inhalation of these relatively high concentrations of fallout debris is not great compared with the exposure from natural occurring materials in the air. In the case of iodine, much larger potential doses result from ingestion rather than from inhalation.

   c. On page 2 of the proposal it is stated: "It has been estimated by one group that the 700 children residing in Washington County who were less than two years of age during the peak exposure period received, in 1953 alone, between 120 and 440 rads to their thyroid from I-131 in milk." This estimate was made by one individual whose methods of calculation received a critical appraisal by an Ad Hoc Committee of experts. Another estimate, reported on the same page of reference 10 (but not quoted in the proposal) was 68 rads with an uncertainty factor of 4. This estimate was based on comparisons with relative concentrations of beta activity in the air. The method used in the second estimate is quite unreliable, as is the method used in the first estimate.

   d. On page 4 of the proposal there is mentioned that one of the tissues of interest is the bone in relation to strontium. The levels of strontium-90 in the foodstuffs in the Nevada-Utah environs are among the lowest in the country.

   e. It is noted on page 5 that "Experimental studies in animals have shown that a variety of maternal traumas can affect the development of fetal teeth." With such variables as these, and many others, how does one delineate the problem?

"COMMENTS ON "LEUKEMIA MORTALITY IN SOUTHWESTERN UTAH"

1. One of the fundamental problems inherent in the study is that since 1954 the association between acute radiation exposure and leukemia has been so well publicized that in the particular area under study it is extremely unlikely that cases would go undiagnosed. One might expect therefore relative to the country as a whole some bias in medical reporting of leukemia in an area which has been publicized as having received relatively high radioactive fallout.

2. Another problem is the extremely difficult one of finding an adequate control population.

3. Using the E. B. Lewis estimate of radiation leukemogenesis, that is, one case/rad/million population, one would expect an excess in a population of 21,000 of a total of 1.5 cases over the 15 year period if (a) everyone had been irradiated, (b) with the maximum 5 roentgen dose, (c) at the beginning of the period. This excess obviously could not be distinguished from the observed rate of 28 cases. Lewis' estimates have been used by the UNSCEAR as the upper limiting case for estimates of leukemia induction by fallout.

4. Radiation-induced leukemia among the Japanese survivors, and among the English Spondylitis cases has been principally granulocytic leukemia. It is interesting to note that the apparent "excess" in the study is attributable almost entirely to lymphocytic leukemia about equally distributed between acute and chronic lymphatic leukemia 3.87 and 3.32 respectively. Chronic lymphatic leukemia has never been alleged to be associated with radiation exposures.

5. The fact that the "excess" deaths occurred predominantly in persons over 35 (a 2 to 1 ratio) would on the face of it appear to be contrary to the generally held belief that children and foetuses are more sensitive to radiation-induced leukemia than adults.

6. The population data does not appear to include the actual population distributions by age and sex that apply to Washington and Iron Counties. In such a small population group differences here could lead to a relatively large error in estimates of expected cases. In any event, it would be helpful to know the basis of the numbers given.

7. We wonder whether the data on leukemia cases are as shown by title of Table 1 applicable to Southern Utah, Southwestern Utah or only to Iron and Washington Counties for which population values have been used. See par. 5, page 2 of the draft report.

8. Great stress is placed in par. 3, page 3, on applying a Poisson distribution to the 28/15 - 2 calculation. Although in a single observation, one may attach statistical significance to a variance of more than two standard deviations, when 20 observations are made, one would expect, by chance, one observation that exceeds the 5 percent confidence. In this light, one is not surpised to find an "excess" number of deaths in one of 15 years (1959) simply from chance alone, just as one is not surprised to find a year, 1952, with no leukemia deaths at all. The concept of clusters of cases in 1959 and 1960 as put forth on page 4, par. 3, would therefore seem to have little substance.

9. Stress has also been laid on the fact that in McMahan's study of leukemia in Brooklyn the "national rates and those from Brooklyn yield numbers in almost perfect agreement." With some 3000 counties in the USA it is not surprising that in an occasional one the rates agree with the national average. By the same token, it should be expected that the rates in a number of counties would deviate from the national average by as much as is seen in these data from Iron and Washington Counties, Utah.

10. The second paragraph on page 5 of the article disclaims any conclusions as to cause of the "excessive" cases in the counties, nevertheless the whole tone of the report is one of accepting the data as having clearly demonstrated excessive leukemia in the two counties. In the end, it highlights a so-called "cluster of cases of primary interest" in 1959 and 1960. It is hard to be impressed by six leukemia deaths in 1959 and not be almost equally impressed by the fact that five of those six deaths were in males, one of which incidentally was in a boy conceived more than a year after the fallout in the spring of 1953 which totalled more in these areas than all preceding and succeeding years combined.

11. In summary, it is difficult to accept the idea that the observed number of cases in Iron and Washington Counties, Utah, 1950-1964, is indeed excessive especially in the absence of information on the number of cases during the same period of time in equally small population groups around the country.

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE

WASHINGTON

MEMORANDUM FOR HONORABLE DOUGLASS CATER

At the August 1963 hearings of the Joint Committee on Atomic Energy, Representative Melvin Price in discussing the results of atomic testing urged that "appropriate studies be undertaken to determine if this exposure has or will cause an increase in the normal incidence of thyroid cancer or other diseases in the exposed groups."

In response to this, the Public Health Service expanded studies of disease patterns in the Utah-Nevada area.

A recent phase of that study - examinations of the thyroid glands of 2,000 students in the 10 to 18 age bracket in Washington County, Utah has resulted in suggestive findings of nodular thyroid in about 70 students. Approximately 25 were found among a control group of 1400 students in Graham County, Arizona.

The Surgeon General of the Public Health Service has therefore formed a panel of nationally known experts to reexamine the group detected by the original team and make recommendations as to further tests. Thyroid nodularity may be a manifestation of non-toxic goiter, inflammatory disease of the thyroid, or either benign or malignant tumors; and biopsies of the thyroid may be necessary in some of the students. This reexamination is scheduled for November 15-16.

The fact that studies are being conducted in association with the Utah State Health Department was made public by the Public Health Service on August 23, 1963. A further announcement was made on September 16, 1963 jointly by the Service and Dr. G. D. C. Thompson, Director of the Utah State Department of Health.

No public reference to the thyroid findings has been made. We did not wish to cause anxiety among the individuals involved and the community at large at a stage when it is not clear that such anxiety has a sound medical basis.

Although this evidence is still not entirely clear, I seriously doubt that it is wise to delay further some sort of public statement. The facts are already known to a fair number of people, and if they begin to receive circulation as rumors the nature of the problem will be considerably magnified. In addition to the anxiety of the parents and the children, we have to consider the possible charge that we have been withholding from the parents and the public information that they have a right to know.

Dr. Thompson meets with his State Board of Health on October 27. These meetings are open to the press; and it is my recommendation that the attached release be issued by the Department shortly before that and by Dr. Thompson at the meeting itself.

Clearly this matter has such broad implications for public policy that the White House, and the AEC, and possibly the State Department, will wish to be aware of it and to comment on how it should be handled publicly.

I am also attaching a series of anticipated questions with the answers that the Service and Dr. Thompson would be prepared to make.

Secretary

4 pm Wed

DRAFT PRESS RELEASE--10/22/65

Preliminary results of physical examinations of thyroid glands in approximately 2,000 school children of Washington County, Utah were announced today jointly by Surgeon General William H. Stewart of the Public Health Service and Dr. G.D.C. Thompson, Director of the Utah State Health Department in Salt Lake City. Results were also given for Graham County, Arizona, where about 1,400 students were examined for "control" or comparison purposes.

The preliminary examinations, made by a team of six physicians organized by the Public Health Service, began September 17, and were completed October 11.

In the opinion of the examining physicians thyroid nodules, or small lumps, may be present in some of approximately 70 of the Washington County students and 25 of the Graham County students.

The next step in the study is for these two groups to be examined by a panel of nationally-known medical authorities on the thyroid gland to determine whether still further tests may be needed by some individuals, and to advise the parents, family physicians, and health officials on each individual situation. Members of the panel are: Dr. Raymond F. Keating, Jr., Mayo Clinic; Dr. Brown M. Dobyns, Cleveland General Hospital; and Dr. Joseph E. Kahn, National Institutes of Health.

Among the abnormalities which may be associated with thyroid nodules are non-toxic nodular goiter, inflammatory diseases of the thyroid, and either benign or malignant tumors. The experts will conduct their studies in Washington and Graham Counties in mid-November.

The thyroid study is part of a comprehensive, long-term investigation being conducted jointly by the State Health Departments of Utah and Nevada and the Division of Radiological Health of the Public Health Service, U. S. Department of Health, Education, and Welfare.

Beginning in 1959 as an examination of leukemia deaths occurring in Utah and Nevada since 1950, the investigation was expanded in 1963 to include thyroid and bone cancer and congenital malformations. The studies are seeking evidence as to whether the incidence of these defects, which occur naturally, may have been increased by radiation exposures received from operations carried out at the Nevada Test Site during the 1950s.

Possible Questions and Answers
On Utah Thyroid Study

Q. If the findings of the study team are confirmed in whole or in part by the panel of experts, what are the next steps?

A. The panel would, of course, advise the family physicians and the parents of the children involved. Their recommendations might include a period of observation, additional tests, and biopsies.

Q. In the event that the thyroid of any of these children is in fact malignant, would this not be apparent at the time tissue is taken for biopsy?

A. Cancer of the thyroid is one of the most difficult malignancies to diagnose, either visually or microscopically. In the event there were suspicion of cancer at the time of tissue removal for biopsy, it is possible to freeze a section of tissue and obtain a clinical diagnosis before closing the incision.

Q. What is the long-term effect of removing a youngster's thyroid?

A. The thyroid hormone can be effectively replaced by prescribed doses of thyroid extract.

Q. If it is concluded that there is an unusual incidence of thyroid cancer in Washington County, what steps will be taken to determine whether a similar situation exists elsewhere in the area?

A. The study will be expanded to other groups who as infants or young children may have been exposed to iodine fallout from the test site area.

Q. To what extent was the area monitored for iodine following the tests?

A. It was not monitored in the early years when many of the tests took place. The significance of internal exposure to radioactive fallout, including iodine, was not well or widely known at the time of the tests and has not yet, in fact, been fully established.

Q. Is it possible to estimate, even roughly, the number of young people who as infants or young children lived in the fallout area?

A. Whether or not additional groups will need to be studied depends primarily on the final outcome of the Washington County study.

Q. Are infants and young children the only ones susceptible to thyroid cancer from iodine fallout, or are they merely the highest risk group in the population?

A. On the basis of current knowledge, susceptibility to thyroid cancer resulting from internal exposure to radioactive iodine drops markedly with age. It is highest in infancy, drops precipitately with each year of growth and is virtually non-existent among adults.

Q. On the basis of the preliminary findings, is there any evidence that any of these children are in acute danger?

A. No. Not even if some are eventually found to have cancer. Cancer of the thyroid is a slowly-maturing, self-contained type of malignancy that can readily be treated through radiation or surgery.

Q. To what extent have population groups outside the Nevada Test Site Area been exposed to radioactive iodine from the Nevada tests?

A. Available information indicates that iodine fallout was far less countrywide than in the areas around the test site.

Info 5-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

September 9, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: USPHS EPIDEMIOLOGY STUDIES IN SOUTHWESTERN UTAH

At Information Meeting 515 on Friday, September 3, 1965, I discussed the subject studies and indicated a report would be circulated. These * studies were also mentioned at Information Meetings 514 and 513.

Tab A is a proposed article by Edward S. Weiss, U. S. Public Health Service, entitled "Leukemia Mortality Studies in Southwestern Utah", together with the AEC staff comments.

Tab B is a proposed study by the U. S. Public Health Service, entitled "Environmental and Genetic Factors in the Oral Dental and Medical Characteristics of Utah School Children", to examine children in southern Utah (Washington County), together with the AEC staff comments. An attempt will be made by the Public Health Service to correlate the results of these studies with radiation exposures from fallout that could have occurred in the 1950's, especially 1953.

Tab C is the U. S. Public Health Service proposed press release concerning the studies, the AEC comments on the press release, and a revised draft proposed by AEC.

Tab D is the proposed letter to be transmitted from the General Manager to Dr. Terry, U. S. Public Health Service.

Whereas, the U. S. Public Health Service has been conducting leukemia and thyroid studies for several years in Utah, they are "paper studies"; i.e., analyses of vital statistics. The proposed studies will encompass physical examinations of some 2,000 children in southern Utah and a so-called control group in southeastern Arizona (Safford County).

* filed in B P

9-9-65

As will be noted in the attachments, the AEC staff has serious reservations concerning the technical adequacy of the proposed studies. Some of the limiting factors are the small radiation exposures possibly received, location of the specific individuals potentially exposed in 1953, and the inadequate sample size. There is little hope that unequivocal data will be developed.

Although we do not oppose developing further data in these areas, performance of the above U.S. Public Health Service studies will pose potential problems to the Commission. The problems are:

(a) Adverse public reaction;

(b) Law suits; and

(c) Jeopardizing the programs at the Nevada Test Site.

The General Manager would like to discuss this matter with the Commission at the Information Meeting on Friday, September 10.

Dwight A. Ink
Assistant General Manager

Attachments:
Tabs A thru D

MH 0 5-3

Those listed below

September 8, 1965

Era O. Walters, Secretary to Dr. Dunham, DEM

MEMORANDUM DTD 9/7/65 RE USPHS EPIDEMIOLOGY STUDIES IN SOUTHWESTERN UTAH

Will you please make the following correction in the attachment to the above-named memorandum entitled: "Comments on Leukemia Mortality in Southwestern Utah" on page 2 par. 3: Line five should read "one observation that exceeds the 5% confidence."

Addressees:
Secretary, Chairman Seaborg
Secretary, Commissioner Palfrey
Secretary, Commissioner Ramey
Secretary, Commissioner Tape
" GM
" AGM
" ACHRD
" OGC
" Dr. Dunning, DOS
Secretariat ✓

9-8-65

Mtd. S-3

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

September 7, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

THROUGH GENERAL MANAGER

SUBJECT: USPHS EPIDEMIOLOGY STUDIES IN SOUTHWESTERN UTAH

Last week I advised you of a proposed article by Edward S. Weiss on "Leukemia Mortality Studies in Southwestern Utah" and a proposed extension of the studies to include thyroid tumors and developmental defects of teeth and the iris of the eyes.

Attached are two documents, namely, a draft letter from the General Manager to the Surgeon General, USPHS, which are comments on the above-mentioned article and proposed study and a copy of Mr. Weiss' draft report.

I should like to discuss this matter with you at the Information Meeting scheduled for 10:00 AM, Wednesday, September 8.

Also attached is a proposed letter to the USPHS commenting on their suggested press release.

Dwight A. Ink
Assistant General Manager

Enclosures
As noted

cc: GM
AGM
ACHRD
Secretariat
OGC
Dr. Dunning, DOS

9-7-65

CROSS-REFERENCE *(Name, number, or subject under which this form is filed)*		[redacted]
	➔	MH&S 3
IDENTIFICATION OF RECORD	DATE	
	TO	
	FROM	
	BRIEF SUMMARY OF CONTENTS	Ltr. to JCAE frm. the GM relative to our nuclear submarines based in Holy Loch, Scotland.
FILED *(Name, number, or subject under which the document itself is filed)*		Security 4-5 Visits by Ships Into Foreign Ports date of ltr: 8-27-65

MLS-3

August 18, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
GENERAL MANAGER
DIRECTOR OF REGULATION

SUBJECT: ACTION PAPER -- RADIATION PROTECTION POLICY

I would like the attached memo re FCR activities considered at an early information meeting.

/s/

G. T. Zapp

Enclosure

cc: Secretariat

X O.M.T. Federal Radiation Council

59-92

6 Tape

~~OFFICIAL USE ONLY~~

DATE : August 12, 1965

FRC/2/8

AB
8.17
T
8.17

FEDERAL RADIATION COUNCIL
Washington, D. C. 20449

ACTION PAPER

RADIATION PROTECTION POLICY

PROPOSAL TO THE FEDERAL RADIATION COUNCIL

Now that the Council's commitment for recommending Protective Action Guides applicable to fallout has been met, the Staff with the aid of the Working Group has examined what activities the Council should undertake next. Possible subjects included:

1. Recommendations concerned with radiation protection in uranium mines.

2. Recommendations concerned with the use of radionuclides in consumer products.

3. Transportation.

4. Radiation protection problems associated with the development of supersonic aircraft for commercial purposes.

5. More severe accidents than evisaged in connection with the PAG recommendations.

6. The use of FRC machinery to facilitate the development of uniform procedures for applying the recommendations of FRC Reports 5 and 7.

7. A review of information bearing on biological effects originating from the introduction of radionuclides such as tritium and carbon-14 into the constituents of nucleic acids.

8. An FRC study of possible overlapping jurisdiction by more than one agency in the same areas resulting from the application of different laws.

It was the consensus of the Working Group that Council recommendations for radiation protection in uranium mines are needed and that the Staff should move to reactivate this project. Appendixes A and B are accordingly submitted for the consideration of the Council.

Received in Office of G. F. Tape
Date 8/17 Time 1055

Paul C. Tompkins

Paul C. Tompkins

OFFICIAL USE ONLY FRC/2/8

RADIATION PROTECTION POLICY

PROPOSAL TO THE FEDERAL RADIATION COUNCIL

THE PROBLEM

1. To approve a Staff proposal for the formulation of Radiation Protection Guides applicable to workers in uranium mines.

BACKGROUND AND SUMMARY

2. At the meeting on September 4, 1963, the Federal Radiation Council approved a list of projects which included a study of the potential radiation hazards in uranium mines. This subject was also reported in the May 26, 1964, Memorandum and report for the President from Chairman Celebrezze.

3. Preliminary drafts of the known technical factors associated with the hazards in uranium mining have been prepared in the past with the assistance of staff representatives from the Council agencies and from the Bureau of Mines, Department of Interior. Study by the Staff and the Working Group has been curtailed for the past two years because of Council activities related to the development of

Protective Action Guides for iodine-131, strontium-89, strontium-90, and cesium-137.

4. The Staff now proposes to reactivate this project and, with the assistance of the Working Group, representatives of the Department of Interior and various consultants, prepare a report for the consideration of the Council.

5. The Department of Interior was directed under Public Law 87-300 to conduct a study and report to Congress upon health and safety hazards (including radiation hazards) in metal and nonmetallic mines (other than coal and lignite). Its report has been issued and made the subject of hearings conducted by a Select Subcommittee of the House Committee on Education and Labor. The House of Representatives Report No. 606, which accompanies the proposed Bill H.R. 8989 includes a discussion of the radiation hazards associated with uranium mining. Section 6 (a) of the Bill directs the Secretary of Interior to develop health and safety standards (which could include radiation standards). Therefore any study on this subject conducted by the Federal Radiation Council should have full participation by the Department of Interior.

OFFICIAL USE ONLY

STAFF JUDGMENTS

6. The proposed program has been developed by the Staff with the assistance of the Working Group and it is our joint consensus that the study should be completed.

RECOMMENDATIONS

7. It is recommended that the Council:

a) Approve the staff proposal to reactivate the study for the formulation of Radiation Protection Guides applicable to workers in uranium mines as shown in Appendix A.

b) Approve the participation of the Department of Interior in this study, as shown in Appendix B.

c) Advise the Executive Director, FRC, by telephone of the agency's action on the proposal.

APPENDIX A

PROPOSAL FOR RECOMMENDATIONS CONCERNED WITH URANIUM MINING

Phase I Revise present estimates of:

1. Long term needs for uranium.
2. Production and occupational information.
3. Environmental levels of radon and radon daughters.
4. Dose-effect relationships between lung cancer and exposure to radon and radon daughters.
5. Methods for reducing and controlling exposure to radon and radon daughters.

Phase II

Based on the information compiled in Phase I, prepare a background report containing the best quantitative description of (1) the biological risks associated with exposure to radon and radon daughters, and (2) the practicability and cost associated with reducing exposures to different values of radiation dose. Formulate recommendations for Radiation Protection Guides and prepare a Memorandum for the President.

For planning purposes, the Staff proposes to target Phase I for completion by January 1, 1966, and Phase II for completion by July 1, 1966. The Council will be advised of any changes in the schedule that might be indicated as the information develops.

The Phase I part of the study will depend heavily on the active participation of the technical staffs of the Bureau of Mines (Dept. of Interior); the Divisions of Occupational Health and Radiological Health (Dept. of HEW); the Divisions of Raw Materials and Biology and Medicine (AEC), and possibly the Bureau of Labor Statistics (Dept. of Labor).

APPENDIX B

DRAFT LETTER TO THE SECRETARY OF INTERIOR

Dear Mr. Secretary:

The Federal Radiation Council, as you may recall, initiated a technical study of radiation hazards associated with uranium mining operations early in 1961.

At the beginning of this study the Council, by letter of February 14, 1961, invited the Department of Interior to participate through designation of a technical representative from the Bureau of Mines to work with the subcommittee undertaking the project. Mr. L. B. Berger was so designated by your letter of February 28, 1961, to Mr. Ribicoff, then Chairman of the Council.

Because of other activities the Federal Radiation Council has not completed action on this study. It is the opinion of the Council that it is now appropriate to update the information relative to radiation hazards in uranium mining. It is anticipated that this review will result in the recommendation of Radiation Protection Guides applicable to uranium mining for the use of Federal agencies in the formulation of their radiation protection activities.

OFFICIAL USE ONLY

Accordingly, we again invite the Department of Interior to participate with the Federal Radiation Council in the proposed project. The proposal of the FRC staff is enclosed for your information.

If you accept this invitation, we would appreciate it if you would designate a member of your Department to work with the FRC Staff and the FRC Working Group. We would also appreciate it if you or your designee would meet with the Council when the Memorandum for the President is considered. Any additional information you wish on the project may be obtained from Dr. Paul C. Tompkins, Executive Director, Federal Radiation Council (1800 G Street, NW, Room 731, Tel: Code 128-22505 or 382-2505).

Sincerely,

John W. Gardner
Chairman

Honorable Stewart L. Udall
Secretary of the Interior
Washington, D. C. 20240

Enclosure

Aug. 13, 1965

Dear Mr. Price:

During the course of the [illegible] Hearings on Protective Action Guides, I indicated that we would supply for the record information on a number of items. [illegible] information is attached.*

Attachment 1 is the excerpt from the AEC regulation, 10 CFR Part 20, to which I referred (page 100 of the transcript) in discussing the difference between the [illegible] doses [illegible] made to the thyroid and 15 rads to the whole body and the AEC [illegible] site criteria doses of 300 rads to the thyroid and 25 rads to the whole body.

Attachments 2 and 3 are in response to Chairman Holifield's request (page 70 of the transcript) to supply for the record information made [illegible] that furnished during the 1965 Hearings concerning our budget [illegible] on countermeasures or proposed protective actions.

[illegible] noted that in 1963 we summarized (pages 319-320 of the 1965 [illegible] a number of programs related to possible protective actions against radioactivity in the environment and provided a detailed budget for those research activities of our Division of Biology and Medicine devoted to this field. The programs summarized in that document did not include the Commission's closely related health and safety program conducted in connection with nuclear explosives tests.

* filed in B.P.

8/13/65

Attachment 2 updates the information that appears on pages 319-326 of the 1963 hearings; Attachment 3 provides a detailed description of health and safety considerations with nuclear explosives tests.

Attachment 4 provides information on radiological assistance team drills relevant to questioning and discussion of this subject by Mr. Hosmer (pages 187 and 235 of the transcript).

Sincerely yours,

/S/ Gerald F. Tape

Enclosures

Distribution:
Cong. Relations (2)
Secretariat (2)
H. L. Price, REG (1)
General Manager (1)
Operational Safety (1) w/o Attachment 3.
Biology & Medicine (1) w/o Attachment 3.

Honorable Melvin Price, Chairman
Subcommittee on Research,
Development and Radiation
Joint Committee on Atomic Energy
Congress of the United States

Attachments:
1. Excerpt from 10 CFR Part 100
2. Updating of Information Furnished in 1963
3. Nuclear Explosive Tests: Health and Safety
4. Information on Radiological Assistance Team Drills

bcc: Dr. Paul C. Tompkins
Executive Director
Federal Radiation Council w/o Attachment 3.

OFFICE ▷	B&S:DIR	CONG. REL.				
SURNAME ▷	FWestern:ms					
DATE ▷	8/5/65	8/ / 65				

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MAY 1962 EDITION
GSA GEN. REG. NO. 27

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Res. & Status Br. - GTN

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: August 6, 1965

FROM : F. T. Hobbs, Acting Secretary

SUBJECT: WALSH-HEALY RADIATION PROTECTION REGULATIONS (MR. PRICE'S JULY 23 MEMORANDUM)

SECY: ICB

At Regulatory Information Meeting 162 on August 4, 1965, the Director of Regulation reported briefly on the problem outlined in his July 23 memorandum. He suggested the Commission might consider the advisability of a meeting between the Chairman and the Secretary of Labor. The Chairman indicated he would attempt to arrange a meeting with Secretary Wirtz during the week of August 9.

cc:
Commissioners
Director of Regulation
Deputy Director of Regulation
Asst. Dir. of Regulation
Asst. Dir. of Reg. for Admin.
Asst. Dir. of Reg. for Nuclear Safety
General Counsel
Dir., Congressional Relations

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9-9-65

7 M & S - 3

10

EARLE CABELL
5TH DISTRICT, TEXAS

WASHINGTON OFFICE:
145 CANNON HOUSE OFFICE BUILDING

DALLAS OFFICE:
408 FEDERAL COURTS BUILDING
PHONE: RI 9-3571

Congress of the United States
House of Representatives
Washington, D.C. 20515

COMMITTEE:
BANKING AND CURRENCY

SUBCOMMITTEES:
INTERNATIONAL TRADE
SMALL BUSINESS

HARRY CRUTCHER, III
ADMINISTRATIVE ASSISTANT

MRS. JO RYALS GUMMELT
EXECUTIVE SECRETARY

July 23, 1965

Dr. Glenn T. Seaborg
Chairman
Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Chairman:

It has come to my attention that the Department of Labor has proposed regulations which would amend the radiation, health and safety standards currently operative.

If this is the case, my State of Texas would find itself dually regulated by both the Atomic Energy Commission and the Department of Labor.

It does not seem appropriate that such authority to regulate materials, etc., should be granted to the Department of Labor, since your Commission has trained personnel already capable of overseeing state programs.

The Attorney General of the State of Texas tells me of the exemplary manner in which your Commission performs its duties. For what reason should the Department of Labor be entering into this field or overlapping your supervisory duties? Please give me the background on this subject and advise me of the current status of these regulations.

Also, is there any possibility that additional public hearings may be held to examine further this matter?

Thanking you in advance for your prompt attention to this request,
I am

Sincerely yours,

Earle Cabell

EARLE CABELL, M. C.

EC:cgj

cy filed PFC - 1-1 Reg. Agreements with States

7-23-65

MHS 3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JUL 23 1965

MEMORANDUM TO CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: WALSH-HEALEY RADIATION PROTECTION REGULATIONS

My memorandum of May 10, 1965 informed the Commission of the publication by the Department of Labor of a proposed amendment to its Walsh-Healey regulations which, if adopted, would entail a compatibility determination of an Agreement State program by the Department which duplicates the compatibility finding the Commission is required to make under section 274 of the Act.

The attached letter, dated May 28, 1965 to Secretary Wirtz, urged that the Department eliminate from its proposed amendment the requirement for a determination by the Department of compatibility of State programs.

We have learned, as a result of an informal inquiry on July 21 to the Assistant Administrator of the Department's Wage and Hour and Public Contracts Division, that the Division is forwarding to Secretary Wirtz for approval and publication an effective amendment which is said to be substantially the same as the proposed amendment discussed in Chairman Seaborg's letter of May 28. There would be published simultaneously a separate notice finding that the Oregon program, which was approved by the Commission on June 3, 1965, is compatible with the Walsh-Healey regulations. Adoption of the effective amendment, as described to the staff, would mean that the Department has not accepted the Commission's request that the Department accept Agreement State programs without duplicating the AEC determinations of the State programs for compatibility.

We understand that the amendment, if approved by Secretary Wirtz, would be published within the next two weeks.

I would like to discuss this matter at an early information meeting.

(signed) Harold L. Price

Harold L. Price
Director of Regulation

Attachment

CC: Secretary (2)
General Counsel (2)

Secretary

7-23-65

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

May 28, 1965

Dear Mr. Wirtz:

We have read with interest the Department's notice of proposed rule making published in the Federal Register on April 16, 1965, to amend the radiation safety and health standards for Federal supply contracts placed with AEC-Agreement State licensees. I would like to take this opportunity to comment on the proposed amendment.

In testimony given at the hearings held by the Department on April 13-15, 1964, the Commission's representatives urged that the Department of Labor amend its regulations in 41 CFR Part 50-204 so that an employer in an Agreement State shall be deemed to be in compliance with the Department's Walsh-Healey radiation safety regulations, if the employer possesses or uses atomic energy materials under an Agreement State license and in accordance with the requirements of the regulatory program of that State. We are pleased that the proposed amendment would adopt this recommendation.

We note, however, that the proposed amendment would add a proviso to the effect that the State's program for the control of these radiation sources must be the subject of a currently effective determination by the Secretary of Labor that such program is compatible with the requirements of Part 50-204.

The Department's radiation safety standards set forth in Part 50-204 and those of the AEC and of the Agreement States are all substantially similar. As you know, under Section 274 of the Atomic Energy Act, the Commission must determine initially that Agreement State programs are compatible with the Commission's program for the regulation of like materials and that they are adequate to protect the public health and safety. The Agreement States in their agreements with the Commission undertake to use their best efforts to assure that State programs will continue to be compatible with the program of the Commission for the regulation of atomic energy materials. In order to assure that Commission and Agreement State programs continue to be compatible, the Commission, among other things, conducts periodic meetings with the individual Agreement States, annual meetings with all Agreement States and an extensive exchange-of-information program. Based on these meetings and information programs, the Commission plans to make a formal annual redetermination of the Agreement States' status with respect to continuing compatibility. We will plan to keep you advised of compatibility determinations made by the Commission of new agreements entered into under Section 274b of the Atomic Energy Act and of annual redeterminations of continuing compatibility which we make.

In view of the Commission's statutory responsibility under Section 274 of the Atomic Energy Act to determine that Agreement State programs for regulation of atomic energy materials are compatible with the AEC program, and the Commission's programs to assure continuing compatibility, we believe that a separate determination of compatibility by the Department would duplicate the determination made by the Commission and that such duplication would be unnecessary and undesirable. We, therefore, urge that the Department of Labor accept Agreement State programs without duplicating the AEC determinations of the State programs for compatibility.

Cordially,

/s/

Chairman

Honorable W. Willard Wirtz
Secretary of Labor

MHS 3

JUL 21 1965

Dear Mr. Celebrezze:

The Atomic Energy Commission hereby submits its report on radiation protection activities for the year ending July 31, 1965 as requested in the Federal Radiation Council Memorandum for the President, dated September 2, 1960.

We believe that activities conducted by AEC licensees and contractors in connection with normal peacetime operations during the past year have been within the Council's Radiation Protection Guides and no deviation from the Guides is expected at this time.

The Commission has continued to notify promptly the Federal Radiation Council of any proposed or adopted regulations in areas covered by the Guides.

Sincerely yours,

(Signed) Glenn T. Seaborg

Chairman

Honorable Anthony J. Celebrezze
Chairman
Federal Radiation Council
Suite 770
1800 G Street, N.W.
Washington, D. C.

Distribution:
Chairman (2)
~~Commissioner Bunting~~
Commissioner Palfrey
Commissioner Ramey
Commissioner Tape
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DATE ▶	7/9/65	7/9/65	7/13/65	7/ /65	7/13/65	7/19/65

7-21-65

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JUL 19 1965

MEMORANDUM FOR CHAIRMAN STANCUP

THROUGH GENERAL MAGRUDER

(Signed) John V. Vinciguerra for

Mk. S-3

THE NATIONAL ASSOCIATION OF ATTORNEYS GENERAL

SECRETARIAT: THE COUNCIL OF STATE GOVERNMENTS

Please reply to:
THE COUNCIL OF STATE GOVERNMENTS
WESTERN OFFICE
211 SUTTER STREET
SAN FRANCISCO, CALIFORNIA 94108
YUKON 6-3780

July 13, 1965

Hon. Glenn T. Seaborg, Chairman
Atomic Energy Commission
Washington, D.C. 20545

Dear Dr. Seaborg:

Enclosed is a set of the resolutions adopted by the National Association of Attorneys General at its 59th Annual Meeting, June 25-30, 1965, in San Antonio, Texas. May I respectfully call your attention to Resolution XII, entitled "Raditaion Protection."

Please let us know if you wish additional copies of the resolutions or if we can be of assistance to you in any other way.

With kindest personal regards,

Sincerely yours,

Elton K. McQuery
Secretary

EKM:mj
enc.

cc: Hon. Jack P. F. Gremillion

Hon. Robert Matthews, Attorney General
of Kentucky and Chairman, NAAG
Committee on Atomic Energy and Space

7-13-65

WHEREAS, The Antitrust Committee of the National Association of Attorneys General carefully reviewed the revision of the proposed act prepared by the Committee on State Antitrust Laws of the American Bar Association's Section of Antitrust Law and concluded that the proposed act is inadequate in a number of respects;

NOW, THEREFORE, BE IT RESOLVED, That the 59th Annual Meeting of the National Association of Attorneys General in San Antonio, Texas commends its Antitrust Committee for its work in reviewing the proposed Uniform State Antitrust Act revised by a committee of the American Bar Association and authorizes the Antitrust Committee to continue its study of the proposed act in its successive drafts; and

BE IT FURTHER RESOLVED, That the National Association of Attorneys General commends the Committee on State Antitrust Laws of the American Bar Association's Section of Antitrust Law for its thoughtful contributions to the drafting of its proposed Uniform State Antitrust Act; and

BE IT FURTHER RESOLVED, That the Association through its Antitrust Committee offers to the National Conference of Commissioners on Uniform State Laws its cooperation and assistance in revising the proposed act so that it will incorporate appropriate policy and procedural provisions for desirable state legislation; and

BE IT FURTHER RESOLVED, That a copy of this resolution and the committee report on which it is based be sent to the Special Committee on Uniform State Antitrust Acts of the National Conference of Commissioners on Uniform State Laws and to the Committee on State Antitrust Laws of the American Bar Association's Section of Antitrust Law in time to permit the views expressed herein to be known prior to the next annual meeting of the National Conference of Commissioners on Uniform State Laws scheduled to take place in August, 1965.

XII. RADIATION PROTECTION

WHEREAS, The hazards of excessive exposure to radiation are such as to require effective and well coordinated programs of radiation protection; and

WHEREAS, Responsibility for and expertise in affording such protection are properly lodged in the states in cooperation with the Atomic Energy Commission; and

WHEREAS, The Congress by enactment of the Federal-State Amendment to the Atomic Energy Act, as well as by other actions, has evidenced its intention that the existing system of coordination of state and federal radiation protection activities not be upset or confused by the entry into the field of competing or duplicative regulatory programs; and

WHEREAS, Recently issued additions to the Walsh-Healey Health and Safety Regulations by the United States Department of Labor threaten to produce such a duplicative and competing program in an agency which is not equipped to administer a program in this field; and

WHEREAS, Even after protest from the Association, from state officials throughout the land, and from the Atomic Energy Commission, the Department of Labor nevertheless promulgated the radiation standards which not only threaten existing federal-state agreements on radiation control but also jeopardize future agreements by non-contracting states;

NOW, THEREFORE, BE IT RESOLVED, That the 59th Annual Meeting of the National Association of Attorneys General in San Antonio, Texas most strongly deplores the continuing efforts of the United States Department of Labor, in flagrant disregard of the efforts by states to effectuate cooperative agreements with the federal government on radiation protection, to inject itself into a field where state agencies in cooperation with the Atomic Energy Commission are best equipped to function, and where the result of its activities will be to weaken if not destroy radiation protection programs now in existence or being established by other state and federal agencies.

(Indiana, Virgin Islands and Wisconsin recorded as voting "no.")

XIII. BAIL

WHEREAS, The National Association of Attorneys General already has expressed its sympathetic interest in work now going forward to improve bail systems and provide substitutes for money bail wherever feasible; and

WHEREAS, Research and experimental programs in the bail field now have reached a point which permits considerable reform to be undertaken on a sound basis of fact and experience;

NOW, THEREFORE, BE IT RESOLVED, By the 59th Annual Meeting of the National Association of Attorneys General in San Antonio, Texas that state and local jurisdictions are urged to undertake programs of bail reform which will:

1. Afford release for persons awaiting legal proceedings to the maximum extent consonant with assurance of their appearance when required in connection with such proceedings;
2. Provide reasonable alternatives such as release on personal recognizance or in the custody of responsible persons in place of detention or the posting of bail bonds or money bail;
3. Substitute procedures such as summons for arrest in an increased number of instances where doing so can reasonably avoid detention or bail; and

BE IT FURTHER RESOLVED, That the Committee of State Officials on Suggested State Legislation of the Council of State Governments is requested to make appropriate bail reform legislation available for consideration by the states.

XIV. POST-CONVICTION REMEDIES

WHEREAS, The Supreme Court of the United States and other federal and state courts have made it clear that persons under sentence for the commission of crime must have comprehensive and workable procedures available to them at all times subsequent to conviction for the determination and protection of their constitutional rights; and

WHEREAS, There are substantial gaps in the post-conviction remedies of most states which make it a virtual certainty that in a number of instances the adjudication of such rights cannot be secured in state courts; and

WHEREAS, It is clear that in the absence of adequate state procedures, the federal courts will provide a remedy, thereby encouraging confusion and lack of finality in the state administration of criminal justice; and

Wright 5-3
Radiation

July 12, 1965

MEMORANDUM FOR: CHAIRMAN SEABORG
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

THROUGH GENERAL MANAGER (Signed) John V. Vinciguerra for JUL 15 1965

SUBJECT: THYROID DISEASE IN RONGELAP ISLANDERS

During the week of July 5, 1965, the three Rongelapese who were brought to this country for study at Brookhaven National Laboratory were operated on at the Lahey Clinic, Boston. You will recall that thyroid tumors were noted at the 1965 medical examination of those exposed to fallout in March 1954 from the Bravo Test.

The two teen-age boys were found to have each a solitary benign tumor of the thyroid. These nodules were removed surgically. The middle-aged woman was found to have a carcinoma of the thyroid gland with some metastases to local structures. A subtotal thyroidectomy was carried out. In her case, the prognosis is fair. She will be given 30 millicuries of Iodine-131 therapeutically to destroy persisting thyroid tissue.

It is interesting that the dose of radioiodine to the thyroid gland in the case of the woman is estimated at about 160 rads, or approximately one-tenth that to the glands of the youths. Presently under consideration is the administration of dessicated thyroid tablets prophylactically to all the Rongelapese who were at Rongelap or Ailinginae at the time of fallout.

Charles L. Dunham

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

cc: Secretariat (2)
GM
AGM/RD
BMA

BM DIRECTOR GM/RD GM

7/15/65

mm.5-3

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Res. & Status Br. - GTN

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: July 7, 1965

FROM : W. B. McCool, Secretary

SUBJECT: REPORT ON IODINE READINGS

SECY:JCH

1. At Information Meeting 495 on July 2, 1965, the Chairman requested additional information on certain iodine readings which were first reported to the Commission at Meeting 2106 on May 12, 1965.

2. It is our understanding that the Office of the Assistant General Manager for Research and Development is taking the required action.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Exec. Asst. to Gen. Mgr.
Dir., Military Application
General Counsel
Asst. Gen. Mgr. for R&D
Special Asst. for Disarmament
Dir., PNE

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7-7-65

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

June 25, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: BACKUP BOOK FOR HEARING ON PROTECTIVE ACTION GUIDES

There is attached a backup book, prepared jointly by the Division of Operational Safety and the Director of the Division of Safety Standards, relating to the forthcoming hearings on the Federal Radiation Council's Protective Action Guides. Commissioner Tape would like any comments concerning his proposed statement and related backup material to be furnished Dr. Forrest Western by noon Monday, June 28.

It is our understanding Commissioners Bunting and Ramey will also attend the hearings scheduled June 29 and 30 before the Subcommittee on Research, Development, and Radiation of the Joint Committee on Atomic Energy.

Signed, John J. Burke
John J. Burke, Director
Congressional Relations

Attachment
As stated

cc: GM
DGM
AGM
AGMO (w/o att.)
OGC
REG (3)
DOS (w/o att.)
SECY (w/o att.)

6-25-65

MH.S-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

June 24, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: ANNOUNCEMENT CONCERNING FRC PROTECTIVE ACTION GUIDES HEARINGS

The attached announcement concerning FRC Protective Action Guides is for your information. An updated agenda is planned for the backup books.

John J. Burke, Director
Congressional Relations

Attachment
As stated

cc: GM
DGM
AGM
EAGM
AGMO
H.Price, REG
N.Woodruff, OS
Secretariat (2)

9-24-65

From the Office of the
Joint Committee on Atomic Energy

No. 489
For Immediate Release
June 23, 1965

JOINT COMMITTEE ON ATOMIC ENERGY ANNOUNCES WITNESS LIST FOR HEARINGS ON FEDERAL RADIATION COUNCIL PROTECTIVE ACTION GUIDES

A tentative schedule of witnesses to present testimony before the Joint Committee's Subcommittee on Research, Development, and Radiation on the Federal Radiation Council's Protective Action Guides was announced today.

The hearings, which are planned for June 29 and 30, 1965, will be held in the Joint Committee's public hearing room, U.S. Capitol Building. The hearings were announced earlier in a Joint Committee press release issued on June 5, 1965. Morning and afternoon sessions have been scheduled to begin, respectively, at 10:00 a.m. and 2:00 p.m.

The tentative schedule of witnesses is attached. For further information on these hearings, contact James B. Graham, staff member of the Joint Committee on Atomic Energy, U.S. Capitol Building, Washington, D. C.

Attachment:
Tentative Witness Schedule for
Hearings on June 29 and 30, 1965

TENTATIVE AGENDA FOR JCAE HEARINGS ON THE
FEDERAL RADIATION COUNCIL'S PROTECTIVE ACTION GUIDES
BEFORE THE SUBCOMMITTEE ON
RESEARCH, DEVELOPMENT & RADIATION

Tuesday, June 29, 1965

Morning (10:00 a.m.)

I. INTRODUCTION - Summary since last JCAE hearings (1963) FRC Report No. 5, FRC Report No. 6 and FRC Report No. 7.

Dr. Paul C. Tompkins, Executive Director, Federal Radiation Council

II. CURRENT DISTRIBUTION OF FALLOUT IN THE ATMOSPHERE AND FOOD CHAINS:

A. Overall Inventories of Fallout in the Environment:

R. J. List, U.S. Weather Bureau

B. Dietary Levels of Fallout Nuclides in Food:

James G. Terrill, Jr., Deputy Chief, Division of Radiological Health, U.S. Public Health Service

C. Cesium and Strontium in the Arctic:

W. C. Hanson, Pacific Northwest Laboratory

Afternoon (2:00 p.m.)

III. DISCUSSION OF FRC REPORTS 5 AND 7

A. Development of PAG's for I-131, Sr-89, Sr-90, and Cs-137:

1. Biological Effects Considerations:
Dr. A. C. Upton, Oak Ridge National Laboratory

2. Environmental Factors: Dr. A. H. Wolff, U.S. Public Health Service

3. Protective Action Considerations:
Dr. A. B. Park, U.S. Department of Agriculture

B. Summary of Considerations:

Dr. Paul C. Tompkins, Executive Director, Federal Radiation Council

Wednesday, June 30, 1965

Morning (10:00 a.m.)

IV. APPLICATION OF PAG PROGRAMS BY FEDERAL AGENCIES

A. Department of Health, Education and Welfare: Dr. Edward W. Dempsey, Special Assistant to the Secretary (Health and Medical Affairs)

B. Department of Agriculture: Dr. George W. Irving, Administrator, Agricultural Research Service

C. Atomic Energy Commission: Dr. Gerald F. Tape, Commissioner

D. Department of Defense: Dr. Theodore B. Taylor, Deputy Director (Scientific), Defense Atomic Support Agency

Afternoon (2:00 p.m.)

V. OTHER INVITED WITNESSES

A. Dr. Lee Farr, Chief, Nuclear Medicine, MD Anderson Hospital and Tumor Institute, University of Texas and Chairman, Committee on Environmental Hazards, American Academy of Pediatrics

B. Dr. Seymour Charles, Chairman, Committee on Environmental Hazards, New Jersey Chapter, American Academy of Pediatrics

C. Dr. G. D. Carlyle Thompson, Director of Health, State of Utah

D. Dr. R. N. Barr, Secretary and Executive Officer, State Board of Health, Minnesota

E. Dr. H. T. Blumenthal, Technical Division, Greater St. Louis Citizens' Committee for Nuclear Information

7M-5-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JUN 24 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: BROOKHAVEN ANNOUNCEMENT ON THREE MARSHALLESE PATIENTS

Attached for your information is a public announcement which AEC's Brookhaven National Laboratory plans to issue for use on Friday, June 25. The announcement will be provided by BNL to science and medical writers, or in response to press inquiry. We do not plan to issue it from AEC headquarters.

The announcement has the approval of the General Manager's Office, Chairman Seaborg and Commissioner Tape.

Duncan Clark, Director
Division of Public Information

Attachment

cc: R. E. Hollingsworth, General Manager

[redacted]

6-24-65

THREE MARSHALL ISLANDERS TO BE AT
BROOKHAVEN NATIONAL LABORATORY

Three people from Rongelap in the Marshall Islands of the Pacific have been brought to the medical research center of AEC's Brookhaven National Laboratory at Upton, Long Island, New York, for examination and treatment. They have nodules in their thyroid glands which appear to be the result of exposure to fallout radiation from a nuclear detonation 11 years ago.

A total of 82 people of Rongelap Atoll were accidentally exposed to fallout radiation from a thermonuclear device tested on March 1, 1954. The average whole body exposure was approximately 175 roentgens, and additional amounts of radiation resulted from absorption of radioiodine in the thyroid glands. Since that time the U.S. Atomic Energy Commission and the Trust Territory of the Pacific Islands have sponsored annual medical surveys of the exposed people. The surveys are carried out by a Brookhaven National Laboratory team, headed by Robert A. Conard, M.D.

Immediately after exposure the people were evacuated to Kwajalein Island for treatment and were subsequently on Majuro Atoll until 1957 when they were returned to Rongelap. On their return to their home atoll the United States provided them with a new village and other facilities and services to assist their re-establishment. The current population of Rongelap is about 228 persons. On April 30, 1965, Congress appropriated $950,000 as "compassionate relief" payment to the 82 persons who were exposed.

(more)

Medical examination in March, 1964, revealed that three girls 13 to 14 years old had developed nodules in their thyroid glands. Following surgery at the U.S. Naval Hospital on Guam, the girls were returned to Rongelap. The nodules were not malignant. A medical report based on these appeared in a May, 1965, issue of the Journal of the American Medical Association.

The three recent cases were detected in March, 1965. Two of them are in boys 12 and 17 years old and the other in a woman aged 41. The patients are being accompanied during their trip by Dr. John Iaman, a Marshallese practitioner, who will serve as interpreter. It is anticipated that the Marshall Islanders will be in this country only a month or so. They arrived in Hawaii on June 15 en route from the Marshall Islands to Brookhaven.

#

NHOS-3

JUN 22 1965

MEMORANDUM FOR CHAIRMAN SEABORG

THROUGH: GENERAL MANAGER

SUBJECT: SUMMARY OF 1965 SURVEY OF THE RONGELAP PEOPLE BY DR. ROBERT CONARD, BROOKHAVEN NATIONAL LABORATORY.

The attached summary, prepared by Dr. Conard, summarizes his findings on the exposed persons of the Marshall Islands during March 1965.

Notable is the detection of thyroid abnormalities in three more persons. These three are scheduled to arrive at Brookhaven National Laboratory June 18 for study and appropriate therapy.

A full report of the findings will appear later this year.

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

Attachment:
Preliminary Statement of Medical Findings in the 1965 Survey of the Rongelap People (11 Years after Exposure to Fallout Radiation), dated June 1, 1965

cc: Commissioner Bunting
Commissioner Palfrey
Commissioner Ramey
Commissioner Tape

BMA 6/ /65

ADA HAStamwood 6/ /65

cc: GM
Secy (2)
AGMRD
BMA
ADMHR

ADMHR	DIRECTOR	AGMRD	GM
HDBruner:pwg	CLDunham	SGEnglish	
6/17/65	6/ /65	6/ /65	6/ /65

June 1, 1965

PRELIMINARY STATEMENT OF MEDICAL FINDINGS IN THE 1965 SURVEY OF THE RONGELAP PEOPLE (11 YEARS) AFTER EXPOSURE TO FALLOUT RADIATION)

The eleventh annual medical survey of the 76 exposed people and 200 unexposed people of Rongelap Island was completed in March of 1965. The health of both the exposed and unexposed people on the Island is generally good, and the nutrition in both groups is satisfactory. Nodules of the thyroid gland were detected in three additional exposed people: two cases in boys 12 and 17 years of age and the other in an adult woman age 41. These nodules appear grossly similar to the nodules found in three teenage girls in 1964. Following surgical treatment, these latter nodules were found not to be malignant. The three new cases are being brought to Brookhaven National Laboratory for further examination and treatment in June, 1965.

No malignancies have been detected in the exposed group which could be related to radiation exposure. No cases of leukemia have been detected. A few people show slight scars, and some have developed moles in the sites of their previous "beta burns", but with no signs of skin cancer.

Mortality and birth rates have been about the same in the exposed as compared to the unexposed group. No increase in incidence of miscarriages and stillbirths in the exposed women has been noted since 1958. Evaluation of growth and development data for children has not been completed, so that no additional statement can be made at this time in regard to the previously noted slight retardation of growth in boys exposed at less than five years of age.

Preliminary analysis indicates that the slight depression of blood elements previously noted has returned to normal.

The people appear to be quite well adjusted to their life on their home island to which they were returned in 1957, and exhibit no untoward psychological reactions to their experience.

Robert A. Conard

Robert A. Conard, M.D.
Head, Marshall Islands Medical Survey
Medical Research Center
Brookhaven National Laboratory
Upton, L.I., New York 11973

bb

MHS- 3

Res. & Status Br. - GTN

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

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UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: June 17, 1965

FROM : W. B. McCool, Secretary

Original signed
W. B. McCool

SUBJECT: JCAE HEARINGS ON FEDERAL RADIATION COUNCIL ACTION GUIDES - JUNE 29 AND 30

SECY:JCH

At Information Meeting 491 on June 16, 1965, the Commissioners noted Commissioners Bunting, Ramey and Tape will attend the June 29-30 Hearings on Federal Radiation Council Action Guides. The Commissioners also noted the Joint Committee should be informed.

cc:
Commissioners
General Manager
Deputy General Manager
Asst. General Manager
Exec. Asst. to Gen. Mgr.
General Counsel
Director, Congressional Relations

cy filed O-M-7-Q CAE
O-M-7 Fed. Rad. Con. "C

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6-1765

7 H.S-3

Congress of the United States

JOINT COMMITTEE ON ATOMIC ENERGY

June 15, 1965

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

Dear Dr. Seaborg:

This confirms the telephone call of June 11, 1965, by Mr. Graham, of the Joint Committee staff, to Mr. William Bartels, Technical Assistant to Commissioner Tape, concerning plans for hearings on the subject of the Federal Radiation Council's Protective Action Guides.

The hearings will be held on June 29 and 30, 1965, before the Subcommittee on Research, Development and Radiation.

A copy of a tentative topical outline for the hearings is attached.

I would appreciate it if you would arrange for the presentation of testimony to the subcommittee covering the policies of the Atomic Energy Commission with respect to application of the guides. (Part IV of the agenda outline.)

Sincerely yours,

Melvin Price

Melvin Price, Chairman
Subcommittee on Research,
Development and Radiation

Attachment:
JCAE Hearing Agenda

6/15/65

14 June 1965

AGENDA FOR
JCAE HEARINGS ON FRC PROTECTIVE ACTION GUIDES
BEFORE THE
SUBCOMMITTEE ON RESEARCH, DEVELOPMENT & RADIATION

June 29 - 30, 1965

I. Introduction

Summary since last hearings (1963)

Report No. 5

Report No. 6

Report No. 7

II. Current Distribution of Fallout in the Atmosphere and Food Chains

A. Overall Inventories of Fallout in the Environment

B. Dietary Levels of Fallout Nuclides in Food

C. Cesium and Strontium in the Arctic

III. Discussion of FRC Reports 5 and 7

A. Development of PAG's for I-131, Sr-89, Sr-90, and Cs-137

1. Biological Effects Considerations

2. Environmental Factors

3. Protective Action Considerations

IV. Application of PAG Programs by Federal Agencies

Representatives from Federal Agencies concerned

V. Public and Other Interested Participants

VI. Summary

In No. 3

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

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UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: May 14, 1965

FROM : W. B. McCool, Secretary

Original signed W. B. McCool

SUBJECT: LABOR-MANAGEMENT ADVISORY COMMITTEE RECOMMENDATION RE CONTINUING COMPATIBILITY

SECY:JCH

At Regulatory Information Meeting 154 on May 12, 1965, following consideration of Mr. Price's May 10 memorandum, Subject: Proposed Amendment to Department of Labor's Radiation Safety and Health Regulations, Commissioner Ramey queried the status of the recommendation of the Labor-Management Advisory Committee on the subject of continuing compatibility between the programs of the Agreement States and the Commission's program.

cc:
Chairman
Commissioner Ramey
Director of Regulation
Deputy Director of Regulation
Asst. Dir. of Regulation
Asst. Dir. of Reg. for Admin.
Asst. Dir. of Reg. for Nuclear Safety
General Counsel

Copies to file
PFC-1-1-Ag Agree with States
Com-7-Labor Mgt. Contacts

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5-14-65

7 M.S. 3

U. S. DEPARTMENT OF LABOR

OFFICE OF THE SECRETARY

WASHINGTON

JUN - 7 1965

Honorable Glenn Seaborg
Chairman, Atomic Energy
Commission
Washington, D. C. 20545

Dear Mr. Chairman:

Your letter of May 28, 1965, containing your comments on the proposed revision of 41 CFR Part 50-204.320 under the Walsh-Healey Public Contracts Act has been received.

Your comments will be fully considered prior to any action on the proposed revision.

Sincerely,

W. Willard Wirtz

Secretary of Labor

CROSS-REFERENCE *(Name, number, or subject under which this form is filed)*		MH&S 3
IDENTIFICATION OF RECORD	DATE	
	TO	
	FROM	
	BRIEF SUMMARY OF CONTENTS	AEC 1121/2 - IODINE-131 IN MILK FROM CHINESE DETONATION OF MAY 14, 1965 Memo frm. OS stating that Idaho Ops. Office has reported the detection of the above in the Idaho Falls area.
FILED *(Name, number, or subject under which the document itself is filed)*		MR&A 7 Communist China date of paper: 6-3-65

6-3-65

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

May 28, 1965

Dear Mr. Wirtz:

We have read with interest the Department's notice of proposed rule making published in the Federal Register on April 16, 1965, to amend the radiation safety and health standards for Federal supply contracts placed with AEC-Agreement State licensees. I would like to take this opportunity to comment on the proposed amendment.

In testimony given at the hearings held by the Department on April 13-15, 1964, the Commission's representatives urged that the Department of Labor amend its regulations in 41 CFR Part 50-204 so that an employer in an Agreement State shall be deemed to be in compliance with the Department's Walsh-Healey radiation safety regulations, if the employer possesses or uses atomic energy materials under an Agreement State license and in accordance with the requirements of the regulatory program of that State. We are pleased that the proposed amendment would adopt this recommendation.

We note, however, that the proposed amendment would add a proviso to the effect that the State's program for the control of these radiation sources must be the subject of a currently effective determination by the Secretary of Labor that such program is compatible with the requirements of Part 50-204.

The Department's radiation safety standards set forth in Part 50-204 and those of the AEC and of the Agreement States are all substantially similar. As you know, under Section 274 of the Atomic Energy Act, the Commission must determine initially that Agreement State programs are compatible with the Commission's program for the regulation of like materials and that they are adequate to protect the public health and safety. The Agreement States in their agreements with the Commission undertake to use their best efforts to assure that State programs will continue to be compatible with the program of the Commission for the regulation of atomic energy materials. In order to assure that Commission and Agreement State programs continue to be compatible, the Commission, among other things, conducts periodic meetings with the individual Agreement States, annual meetings with all Agreement States and an extensive exchange-of-information program. Based on these meetings and information programs, the Commission plans to make a formal annual redetermination of the Agreement States' status with respect to continuing compatibility. We will plan to keep you advised of compatibility determinations made by the Commission of new agreements entered into under Section 274b of the Atomic Energy Act and of annual redeterminations of continuing compatibility which we make.

Reg Legislation
154

5 P.S. 65

In view of the Commission's statutory responsibility under Section 274 of the Atomic Energy Act to determine that Agreement State programs for regulation of atomic energy materials are compatible with the AEC program, and the Commission's programs to assure continuing compatibility, we believe that a separate determination of compatibility by the Department would duplicate the determination made by the Commission and that such duplication would be unnecessary and undesirable. We, therefore, urge that the Department of Labor accept Agreement State programs without duplicating the AEC determinations of the State programs for compatibility.

Cordially,

Chairman

Honorable W. Willard Wirtz
Secretary of Labor

DISTRIBUTION
Chairman & Commissioners (5)
SECY (2)
REG
OGC
SLR

mN.S-3

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

May 27, 1965

MEMORANDUM FOR CHAIRMAN SEABORG

SUBJECT: LETTER TO SECRETARY WIRTZ

The attached letter to Secretary Wirtz has been revised based on discussions at a recent Information Meeting. As requested by you at that meeting, the revision has been cleared with Commissioners Bunting and Ramey.

(Signed) HLP

Harold L. Price
Director of Regulation

Attachment:
Ltr to Secy. Wirtz

cc: Commissioner Bunting
Commissioner Ramey
Secretary ✓

5-27-65

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

Dear Mr. Wirtz:

We have read with interest the Department's notice of proposed rule making published in the Federal Register on April 16, 1965, to amend the radiation safety and health standards for Federal supply contracts placed with AEC-Agreement State licensees. I would like to take this opportunity to comment on the proposed amendment.

In testimony given at the hearings held by the Department on April 13-15, 1964, the Commission's representatives urged that the Department of Labor amend its regulations in 41 CFR Part 50-204 so that an employer in an Agreement State shall be deemed to be in compliance with the Department's Walsh-Healey radiation safety regulations, if the employer possesses or uses atomic energy materials under an Agreement State license and in accordance with the requirements of the regulatory program of that State. We are pleased that the proposed amendment would adopt this recommendation.

We note, however, that the proposed amendment would add a proviso to the effect that the State's program for the control of these radiation sources must be the subject of a currently effective determination by the Secretary of Labor that such program is compatible with the requirements of Part 50-204.

The Department's radiation safety standards set forth in Part 50-204 and those of the AEC and of the Agreement States are all substantially similar. As you know, under Section 274 of the Atomic Energy Act, the Commission must determine initially that Agreement State programs are compatible with the Commission's program for the regulation of like materials and that they are adequate to protect the public health and safety. The Agreement States in their agreements with the Commission undertake to use their best efforts to assure that State programs will continue to be compatible with the program of the Commission for the regulation of atomic energy materials. In order to assure that Commission and Agreement State programs continue to be compatible, the Commission, among other things, conducts periodic meetings with the individual Agreement States, annual meetings with all Agreement States and an extensive exchange-of-information program. Based on these meetings and information programs, the Commission plans to make a formal annual redetermination of the Agreement States' status with respect to continuing compatibility. We will plan to keep you advised of compatibility determinations made by the Commission of new agreements entered into under Section 274b of the Atomic Energy Act and of annual redeterminations of continuing compatibility which we make.

In view of the Commission's statutory responsibility under Section 274 of the Atomic Energy Act to determine that Agreement State programs for regulation of atomic energy materials are compatible with the AEC program, and the Commission's programs to assure continuing compatibility, we believe that a separate determination of compatibility by the Department would duplicate the determination made by the Commission and that such duplication would be unnecessary and undesirable. We, therefore, urge that the Department of Labor accept Agreement State programs without duplicating the AEC determinations of the State programs for compatibility.

Cordially,

Chairman

Honorable W. Willard Wirtz
Secretary of Labor

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

MH.S-3

~~CONFIDENTIAL~~

Res. & Status Br. - GTN

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: May 17, 1965

FROM : W. B. McCool, Secretary

SUBJECT: IODINE READINGS

SECY: JCH

1. At Meeting 2106 on May 12, 1965, the Commission noted staff's report on certain iodine readings and requested correlation and confirmation of all available data.

2. The Commission also agreed staff should notify interested Executive agencies in preparation for the May 13 meeting of the Principals.

3. It is our understanding the Office of the Assistant General Manager for Research and Development has taken the required action.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Exec. Asst. to Gen. Mgr.
Asst. Gen. Mgr. for R&D
General Counsel
Director, PNE
Special Asst. Disarmament
Director, Operational Safety

[redacted]
GROUP 3
Downgraded at 12 year intervals; not automatically declassified

[redacted] This material contains information affecting the national defense of the United States within the meaning of the espionage laws, Title 18, U.S.C., Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited.

CONFIRMED TO BE UNCLASSIFIED
DOE NSI DECLASSIFICATION REVIEW E.O. 12958
BY: Jim Thorp DOE/NN-823 12/22/98

CLASSIFICATION CANCELLED
DATE 9/13/93
For The Atomic Energy Commission
Charles F. Knezel
Assistant Director
Division of Classification

Copy filed:
IA-11 Inter-Central

[redacted]

PFC-1- Reg Agree with State

MAY 1 0 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: PROPOSED AMENDMENT TO DEPARTMENT OF LABOR'S RADIATION SAFETY AND HEALTH REGULATIONS

On April 16, 1965, the Department of Labor published for public comment a proposed amendment to its Walsh-Healey regulations which would provide that employers who possess or use source, byproduct or special nuclear material under a license issued by an Agreement State would be deemed to be in compliance with the Department's regulations, provided the State's program is the subject of a currently effective determination by the Secretary that such program is compatible with the Department's regulations. If this amendment is adopted, it would entail a compatibility determination of an Agreement State program by the Department which duplicates the finding of compatibility the Commission is required to make under Section 274 of the Act.

The attached letter to Secretary Wirtz urges that the Department of Labor eliminate from its proposed amendment the requirement for a determination by the Labor Department of compatibility of State programs.

The letter is consistent with the views of the Commission as expressed in a proposed letter to Senator McClellan which we forwarded to the Bureau of the Budget for clearance on April 27, 1965.

I would like to discuss this at an early information meeting.

bcc: Harold L. Price

(Signed) HLP
Harold L. Price
Director of Regulation

5-10-65

Copy folder:
PFC-1- Reg Agree with State

Attachment

CC: Secretary ✓
General Counsel

REG
HLPrice:hkm

See: AEC-R-101/1-PFC-1- Reg agree with State
AEC-957/12-Legal U. and text
AEC 604/84-MH.S-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

Dear Mr. Wirtz:

We have read with interest the Department's notice of proposed rule making published in the Federal Register on April 16, 1965, to amend the radiation safety and health standards for Federal supply contracts placed with AEC-Agreement State licensees. I would like to take this opportunity to comment on the proposed amendment.

In testimony given at the hearings held by the Department on April 13-15, 1964, the Commission's representatives urged that the Department of Labor amend its regulations in Part 50-204 so that an employer in an Agreement State shall be deemed to be in compliance with the Department's Walsh-Healey radiation safety regulations, if the employer possesses or uses atomic energy materials under an Agreement State license and in accordance with the requirements of the regulatory program of that State. We are pleased that the proposed amendment would adopt this recommendation.

We note, however, that the proposed amendment would add a proviso to the effect that the State's program for the control of these radiation sources must be the subject of a currently effective determination by the Secretary of Labor that such program is compatible with the requirements of 41 CFR Part 50-204.

The Department's radiation safety standards set forth in Part 50-204 and those of the AEC and of the Agreement States are all substantially similar. For this reason, and since the AEC has a statutory responsibility under the Atomic Energy Act of 1954, as amended, to determine that Agreement State programs for the regulation of atomic energy materials are compatible with the AEC regulatory program, it is our view that a separate determination of compatibility by the Department would duplicate the determination made by the Commission and that such duplication would be unnecessary and undesirable.

We, therefore, urge that the Department of Labor accept Agreement State programs without duplicating the AEC review of the State programs for compatibility. We would, of course, keep you currently advised of

compatibility determinations made by the Commission and of agreements entered into under Section 274b of the Atomic Energy Act.

Cordially,

Chairman

Honorable W. Willard Wirtz
Secretary of Labor

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: April 28, 1965

FROM : Evelyn C. McQuown, Chief E McQuown
Research and Status Branch

SUBJECT: PHS PAPER ON FALLOUT FROM UNDERGROUND NUCLEAR TESTS

1. After discussion of this matter at Information Meeting 438 on December 29, 1964, the Commissioners agreed staff should conduct discussions with PHS representatives and report back to the Commission.

2. The Office of the General Manager has informed this office that the PHS has returned the manuscript to the originators and that this matter is closed for the time being.

See memo to file dated 12-30-64

57-84-45

MHoS 3

10

U. S. HOUSE OF REPRESENTATIVES
Committee on Education and Labor
Adam C. Powell, Chairman
SELECT SUBCOMMITTEE ON LABOR
Washington, D. C.

April 26, 1965

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

Dear Dr. Seaborg:

On Monday, May 3, the Select Subcommittee on Labor of the House Committee on Education and Labor will begin hearings on H. R. 6961 and related bills to promote health and safety in metal and nonmetalic mineral industries. On Monday, May 3, Secretary of the Interior Udall and other persons from the Department of the Interior will testify in support of H. R. 6961, an Administration Bill.

The Subcommittee would very much appreciate the appearance of yourself -- or your designee -- at the hearings on Tuesday, May 4, to present a statement with respect to H. R. 6961.

H. R. 6961 is based upon a study of safety in this industry conducted pursuant to Public Law 87-300. The results of that study are contained in a two volume report to the Congress by the Secretary of the Interior entitled, "Health and Safety Study of Metal and Nonmetal Mines". The best source for the legislative history of Public Law 87-300 is the transcript of the hearings before this Subcommittee in the 87th Congress on H. R. 5435. These hearings were conducted in July 1961.

At the time of the 1961 hearings considerable attention was given to testimony from officials of the Public Health Service with regard to radiation dangers and health hazards in uranium mines.

I assure you that the Subcommittee is looking forward to receiving your testimony on this matter on May 4.

With kind personal regards, I am

Sincerely yours,

/s/ Elmer J. Holland

EJH:REK

EIMER J. HOLLAND, MC., CHAIRMAN
Select Subcommittee on Labor

cy filed Legal & Legislative

4-26-65

M H+S - 3 Radiation

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

APR 26 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: QUESTIONS AND ANSWERS ON PALANQUIN

The attached questions and answers on Palanquin were drafted on Friday, April 23rd and were checked with Spurgeon Keeney and Charles Johnson at the White House after they had been approved by the Deputy General Manager. Mr. Keeney and Mr. Johnson agreed that questions on radioactivity from Palanquin would have to be answered, but urged that we not include information on specific levels of radioactivity, on the basis that such figures are confusing to the layman.

Today, the Nevada Operations Office advised us that there was public concern about radioactivity in milk in the Winnemucca Nevada area. The County Extension Agent at Winnemucca and the County Chairman of the Nevada USDA State Defense Board advised the Nevada Operations Office that there are rumors in the community about the dumping of milk, hazards to children from drinking of milk and the flying of some residents to the Nevada Test Site for whole-body counter.

The Information Officer at NVOO satisfied the two officials that there was no health problem but they recommended that information be given to the local newspapers to quiet the rumors. With the approval of the Deputy General Manager, we advised the Information Officer at NVOO to talk to the editors of the two Winnemucca newspapers, stressing that the levels of radioiodine in milk are not a hazard, that the Public Health Service had been following the situation and has been making most of the measurements, that monitoring and the taking of samples are routine measures to obtain information on environmental radioactivity and that

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detailed information will be published after it has been obtained and correlated.

The Information Officer reports that his conversations with the editors were quite satisfactory. The editors indicated that they understood that the actions being taken by AEC were routine and that there is no need for public apprehension. The Information Officer believes that stories resulting from his calls will help quiet the rumors.

for Duncan Clark, Director
Division of Public Information

Attachment

cc: E. J. Bloch, Deputy General Manager

W. B. McCool, SECY
George Kavanaugh, OGM
John Kelly, PNE
Gordon Dunning, OS
J. Hennessey, GC

MH-S-3

April 13, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER HUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: MEETING OF FEDERAL RADIATION COUNCIL APRIL 15, 1965, TO CONSIDER ACTION PAPER FRC/2/7

Attached to this memorandum is a copy of FRC Action Paper FRC/2/7, transmitting a proposed Memorandum to the President, and a draft background report. These will be considered by the Council, April 15, 1965.

The Memorandum recommends guidance for decisions on possible protective action in a situation involving an unusual deposition of Sr 89, Sr 90 and Cs 137 in the environment. The recommendations and discussions contained in these papers are similar to those applicable to Iodine 131 contained in a memorandum approved by the President in July 1964 and in FRC Staff Report Number 5 issued at the same time. However, environmental situations involving radioactive strontium and cesium are more complex because of longer half-lives and because situations of interest are likely to involve comparable quantities of all three of the isotopes.

The approach used in the case of Iodine 131 has been expanded by defining three categories of environmental contamination that might result from a particular incident and by proposing that, in making decisions to initiate protective action, each category shall be considered independently. The three categories are:

Category I, situations involving transmission of the radioactivity from pasture to milk to man;

Category II, situations involving food and feed crops directly affected by the deposition of radioactivity from the atmosphere; and

Category III, long term situations involving uptake of Sr 90 from the soil by vegetation.

4-13-65

As in the case of Iodine 131 protective action in Category I would generally involve the substitution of stored feed for pasturage. In Category II, protective action may involve condemnation of foods or feeds, but in some cases less drastic measures may be effective. In Category III, protective action would involve long term changes in farming practices and land utilization.

The Protective Action Guide recommended for Category I is a mean dose of 10 rads in one year to the bone marrow or whole body of individuals (children from 1 to 2 years of age) in the general population, provided that not more than one-half of this dose shall be due to Sr 90. As an operational technique it is assumed that this condition will be met effectively if the average projected dose to a suitable sample of the population does not exceed one-third this value (approximately 3 rads). The Protective Action Guide recommended for Category II is identical with that recommended for Category I except that the numbers are 5 rads and 2 rads instead of 10 rads and 3 rads. Doses to the bone marrow from the three radioisotopes are additive.

Decisions to take protective action with respect to a particular category are generally independent of consideration of the other categories. This is the reason that separate Protective Action Guides are recommended for Categories I and II. Because of the long periods of time that would be available for making decisions in Category III and the wide range of possibilities that might exist, it is recommended that each situation in this category be evaluated independently. Evaluation would not be required unless exposures exceed those that might occur as the result of release of radioactivity to the environment under the limits established for normal peacetime operations.

The recommendations summarized above represent a revision, made on April 13, of those contained in the attached Memorandum (pp. 16-20). The revisions have resulted from comments and proposals of staff of U.S. PHS and AEC. The U. S. PHS would prefer the use of the fraction one-third instead of one-half in limiting the dose due to Sr 90 in Categories I and II.

A number of changes in the text of the draft Memorandum have been proposed, most of these are editorial. Most substantive changes deal with the recommendations applicable to situations in three categories. A list of recommended changes will be provided the Council on Thursday for final approval. Included among these will be a statement proposed by Commissioner Dunning to make it clear that Category I and II and, possibly III normally arise from the same event and that the possible sum of the doses from Category I and II would not be excessive.

[redacted]

Original signed by
Forrest Western

[redacted]

[redacted]
as stated - filed in E.P.

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MHOS-3

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FEDERAL RADIATION COUNCIL
WASHINGTON, D.C. 20449

April 8, 1965

MEMORANDUM FOR: Federal Radiation Council Members

SUBJECT: FRC Meeting - April 15

Attached is the agenda for the Council meeting of April 15 and a copy of the staff report which contains the background material leading to the recommendations in the Memorandum for the President. The draft memorandum was submitted to the Council by Staff Paper FRC/2/7, March 29.

Working Group members have also been sent copies of the agenda and report with a request for their general comments on the report at a meeting scheduled for the morning of April 13.

Paul C. Tompkins

Paul C. Tompkins
Executive Director

Attachments

4-8-65

FOR OFFICIAL USE ONLY

FEDERAL RADIATION COUNCIL MEETING

April 15, 1965 - 10 a.m.

Office of the Secretary of Health, Education, and Welfare - Room 5542

AGENDA

1. Statement by the Chairman -- Introduction of Members

2. Briefing by Executive Director

3. Action on the Memorandum

4. Publication of Background Staff Report and NAS Report

5. Schedule for Transmission of Memorandum and Report to the President.

FOR OFFICIAL USE ONLY

April 7, 1965

Dear Chet:

This is in reply to your letter of March 15, 1965, concerning the Atomic Energy Commission's program for studying the biological and environmental consequences of nuclear war and the RAND Corporation's contribution to this study program.

We are satisfied that the people selected by RAND have unique capabilities and provide a desirable distribution of scientific personnel for the purpose of the contract; namely, to supplement the effort of the AEC scientists of the Technical Analysis Branch of the Division of Biology and Medicine. This Branch was established to devote full time attention to the problem of the biological and environmental consequences of nuclear war, and has available to it not only the entire staff of the Division, but also a substantial amount of the Nation's biomedical expertise. Many experts have in fact been consulted on various specific problems. (See Enclosure B for a list of such experts and their affiliations.)

The Commission believes that a realistic approach to the problem of the biological and environmental consequences of nuclear war requires the services of some people whose specialization is largely in subjects that are closely related to biology, but which are not biology in the strictest sense of the term. The RAND contract is responsive to this requirement. I do not believe that the broad categorization of RAND personnel by job title or primary specialization adequately reflects the abilities of many of these people to contribute to the study. Moreover, in some cases their competence has been supplemented by specialists who are not included on the list of full time RAND employees. To give some examples of these two points:

1. J. Hill, a physicist at RAND, is working with J. Neel, a RAND consultant who is a plant physiologist and faculty member at San Diego State College, on non-urban fire spread and its biological aftermath.

2. Y. Katz, who is probably identified as a meteorologist on your list, but who is also trained in agriculture, is studying soil erosion after removal of vegetation by fire and radiation.

3. M. Plesset, a physicist, is surveying current theory and data on the distribution of carbon 14 within the biosphere, for evaluation of the post attack biological hazard it may pose.

4. J. Lowry, a demographer, is exploring possible changes in the demographic structure of the post attack population. These changes could have implications for such matters as radiation protection standards and medical and health problems.

5. H. Mitchell, the physician, and S. Blumenfeld, the biologist, have been concerned with studies of the biological effects of floods, infectious disease problems, and the effects of fire and radiation on the microbiological properties of soil.

A somewhat more complete account of the various projects involved is given in Enclosure A, RAND's Semiannual Progress Report, 15 August 1964 - 15 February 1965.

As the study progresses and the problems are more specifically defined, both the Technical Analysis Branch and RAND will undoubtedly need to augment their biological staffs. I do not believe this recruitment will present insurmountable obstacles.

I am grateful for your interest in this question. Please do not hesitate to call on me or my staff if we can be of further assistance.

Cordially,

Glenn T. Seaborg

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

Enclosures A and B

Re-written in Office of Commissioner Palfrey (H. S. Shapiro); retyped in office of Chairman.

ENCLOSURE A

Comm/I

TECHNICAL ANALYSIS BRANCH

ADMINISTRATIVE REPORT

AR-173-TAB

February 1965

SEMIANNUAL PROGRESS REPORT

Prepared for: U. S. Atomic Energy Commission

Contract No.: AT(04-3)-414, Project Agreement No. 3

The RAND Corporation
SANTA MONICA • CALIFORNIA

SEMIANNUAL PROGRESS REPORT

15 August 1964 - 15 February 1965

(Principal Investigators: J. E. Hill, R. D. Specht)

A program of study on the postattack environment resulting from nuclear war is being conducted by RAND for the Technical Analysis Branch of the Division of Biology and Medicine under Project Agreement No. 3. During the fourth six-month period of the program TAB-RAND discussions of the scope and methods of approach for the RAND study continued. These discussions are reflected in Mr. Hal Hollister's 8 September 1964 revision of the TAB program document "The TAB Study of the Biological and Environmental Consequences of Nuclear War: A Note on Scope and Approach."

As part of the consulting function provided TAB by RAND, E. S. Quade prepared and sent to Mr. Hollister some suggestions on the possible use of systems analysis to help TAB ("Some Thoughts on the TAB Problem," 25 September 1964) and commented on a paper by B. B. Field, "The Problem of Posfattack Viability: An Essay on Methodology."

In addition J. E. Hill has provided comments to TAB on the above paper by B. B. Field and on a draft of a paper by L. L. Eberhardt, "Notes on Ecological Aspects of the Aftermath of Nuclear Attack." Also, comments were sent to TAB on a "Proposal for Development, Exploration and Exploitation of Accurate Models to Simulate the Response of Ecosystems to Environmental Insults" prepared by S. I. Auerbach, G. M. Van Dyne, J. S. Olson and B. C. Patten of the Radiation Ecology Section of Oak Ridge National Laboratory.

RM-4030-TAB, Systems Analysis for the Postattack Environment: Some Reflections and Suggestions, by R. D. Specht was mailed on 22 September 1964 to addressees on the approved distribution list.

Description of Progress

1. Flood Damage in Relation to Postattack Biology Problems. (H. H. Mitchell)

   After receiving comments from Mr. Hollister, we revised and published RM-4238-TAB, Floods and the Postattack Problem: A Preliminary Survey, in January 1965. Copies were mailed to approved addressees on 18 January 1965.

The revision consisted of adding the ten-year moving annual average loss, adjusted to the 1950-1951 dollars and development level, for the period from 1903 to 1951. The maximum annual moving average was $313 million and the minimum $66 million. The maximum cumulative loss for a ten-year period was $3.13 billion and the minimum $660 million.

2. Postattack Infectious Disease Problems. (H. H. Mitchell)

Plague was chosen as the first unit of a study of postattack health problems which may result from infectious diseases. A draft of this unit is being prepared. Although an occasional plague case occurs in humans, plague in the U.S. is currently not so much a real as a potential health problem. Endemic foci of plague in wild rodents and other wild animals extend from the Pacific Coast eastward to the 100th meridian. Thus the postattack problem resolves itself into one of considering the possibility of an outbreak of a disastrous epidemic in humans under conditions of postattack chaos and breakdown of public health safeguards.

Material is also being collected on potential postattack problems which may result from tuberculosis under conditions of increased stress, since the incidence of tuberculosis is known to increase in large populations subject to physical hardships, malnutrition, etc. Also the added effect of radiation exposure is being studied.

Another area of study being explored is the influence of the postattack environment on diseases transmitted from animals and/or insects to man, such as plague, tuberculosis, typhus fever, malaria, encephalitis, etc.

3. Rural Fire Damage Assessment (J. E. Hill, R. E. Huschke, J. W. Neel, L. H. Wegner)

The purpose of this project is to develop methods for estimating the extent of wildland fire damage which might result from a nuclear attack. A quantitative measure of the degree to which 14 principal types of U. S. wildland fuels will ignite and burn under varying seasonal and meteorological conditions has been defined and is called the "burning index."

This was combined with a climatology relating meteorological data to wildland fire danger, based on a ten-year fire weather history, to determine the seasonal and spatial distributions of wildland flammability for the United States. The ten-year climatology, which was provided on tape by Mark J. Schroeder and Clive Countryman of the U.S. Forest Service Forest Fire Laboratory at Riverside, California, consists of fire weather parameters for 89 observing points in the U.S. at the average hour of maximum fire hazard each day for ten years, a total of over 325,000 observations.

The interdependence of snow-cover and burning index is being tested by use of a 170-day sample for which explicit snow-cover information is available. The outcome of this test will determine whether or not snow-cover probabilities should be applied to adjust fire-area frequencies.

Using the above material, daily fire-danger indexes are being calculated and computation plans have been formulated which will permit a final frequency analysis of areas burned for each of the 14 fuel types, on the assumption that sufficient thermal energy is provided to ignite dry kindling fuels.

A report is in preparation, describing the methods outlined above.

4. Weather Modification as a Result of Nuclear War. (R. R. Rapp, E. S. Batten)

The literature discussing the possible effects that isolated nuclear detonations may have on the weather has been reviewed. Four principal mechanisms by which nuclear detonations may influence the weather have been suggested: (1) direct energy input to the atmosphere; (2) debris acting as cloud seeding agents; (3) debris changing the electrical balance of the atmosphere; and (4) debris changing the effects of solar radiation on the earth and atmosphere.

A preliminary analysis of applicable meteorological theory and the meager observational evidence suggests that individual detonations are not likely to have any observable effect. The energy release, even for the largest devices tested, is small compared with the radiant solar energy and is released on a time and space scale which is incompatible with atmospheric disturbances. The number of additional freezing nuclei introduced is small compared with the number of natural nuclei already available. The electrical effects are not sufficiently understood to make any judgment as to their importance, and the number of particles remaining in the atmosphere is too small to change transmission and absorption of solar radiation appreciably.

When large numbers of nuclear devices are exploded in a short space of time, as might happen in a nuclear war, the energy equivalent of a tropical storm (several hundred megatons) might be released in an area comparable to that of a cyclone. However, the manner in which this energy would be absorbed and dissipated by the atmosphere is not known. The number of nuclei and the extent of electrical disturbance would be radically changed. The amount of dust injected into the atmosphere could be greater than that injected by some of the more spectacular volcanic eruptions.

Also, secondary effects on weather and climate may be caused, for example, by removal of vegetation as a result of large scale fires and radiation damage.

Although these considerations indicate that changes in weather and climate are possible, quantitative predictions are not possible until better theory is available of the way in which these factors interact with the atmosphere to alter weather and climate. Consequently, we have initiated basic studies to provide a better understanding of the effects of these various parameters on weather and climate so that quantitative estimates will be possible.

A report on the progress of the work to date is in preparation.

5. Post Attack Soil Erosion Problems. (Y. H. Katz)

During this period work has been initiated to study the magnitude of soil erosion problems which might be experienced as a result of large scale removal of vegetation by fire and radiation following a nuclear war. This project obviously involves the results of projects 3 and 4 above, so that together all three will contribute to a better understanding of the effects of nuclear war on the biosphere.

6. Potential Disparities in Survival of Different Populations Following Nuclear Attack. (N. A. Hanunian, N. D. Cohen, D. Hatch, D. T. Rumford)

The revisions in the Quick Count Program made necessary by the change from the IBM 7090 to the IBM 7044 computer have been completed and successful runs for all the variants definitely planned have been made. Verification and analysis of the results are in progress. In general the nation-wide results of the Quick Count runs appear to verify the more limited results obtained earlier with a much cruder model:

The more refined model not only provides more reliable estimates but also makes it possible to examine survival disparities by regions, for blast and fallout, separately. In addition, the influence of different weapon yields and wind patterns on survival disparities can be investigated.

Increased confidence in the results was obtained by using a much more complex model. To derive maximum benefit from the computing scheme that was adapted for the purpose, substantial elaboration upon the population representations used initially was possible. The utility of each elaboration was checked as the work progressed. As a result, the representation of the rural population has recently been much improved

over the original version, as that of the urban population had been earlier. Monitoring points were added in all the most important counties which contained a target as well as in those individually accounting for 3 per cent or more of a region's population in any category. Thus the monitoring points more faithfully represent the centroids of rural populations.

Work continued on an exploration of the effects of separation of members of families at the time of attack, using data made available to RAND by the Chicago Area Transportation Study. We are also investigating the disparate losses between high- and low-income families, the implications for supply and demand potentials of disproportionate survival of some industries, and the extent to which urban casualty rates are sensitive to attacks occurring during the day or at night. The indications are that this work will greatly improve our understanding of how such factors may alter the composition of postattack populations.

7. Sensitivity Analysis Using a Modified Quick Count Model. (M. E. Arnsten, R. D. Specht)

Work on this project during the period has been confined to writing up the material which was previously given in the series of briefings listed in the last semiannual report. Drafts of more than half of the material have been prepared but some revisions may still be necessary before they will be available for comment by TAB.

We hope to complete a final report on this work during the next month or two.

8. Microbiologic Ecology in the Postattack Environment. (S. N. Blumenfeld)

The study of the short and long term effects of nuclear war on postattack microbiologic ecology has been divided into two parts. The first considers the possible effects of extensive burning of crop land, grazing land, and forests on the microbiology of the soil. The second examines the effects of high levels of residual radiation on the microbial populations in the soil.

The first part has been completed and a draft report of the results has been given to TAB for comment. The draft reviews the essential role of the soil microflora in the over-all ecology of the planet in order to emphasize the importance of any significant changes which might result as a consequence of nuclear war.

The susceptibility of microorganisms to destruction by heat has been studied in detail. The thermal death point of a given organism depends

on the temperature and duration of exposure and can be described by a logarithmic curve relating time and temperature which is characteristic for each type of organism, but an envelope of 120°F to 212°F and 3 minutes to 120 minutes would enclose the thermal death points for the vast majority of vegetative bacteria, actinomycetes, and other fungi.

Soils are poor conductors of heat, however, and experience has shown that forest fires and crop burning fail to sterilize soil in nearly all cases. In fact, the burning of vegetative cover rarely causes deteoriation and nearly always increases soil fertility.

Study of the above evidence leads to the conclusion that extensive burning of crop, grazing, and forest land consequent to a nuclear war may not seriously reduce the microbial soil populations nor should it affect the ability of the soil to support new growth. Indeed, it is likely that the addition of the ash would increase the ability of the soils to produce acceptable crop yields for one or two seasons without the addition of fertilizer, should that commodity be in short supply.

The second part of the study is not yet completed but an extensive literature on the effects of radiation on bacteria is available. Data from these sources show bacteria to be among the most radiation-resistant organisms. In fact sterilization of bacteria and fungi in soil by radiation has been found to require doses on the order of 10^6 roentgens. Moreover, unless one or more species are absolutely eradicated, heterogeneous populations of microorganisms tend to return to their normal ecological balance in a matter of weeks and the survivors and their progeny do not appear to be appreciably different genetically from the parent population.

During the next six-month period the effect of internal radiation on soil microflora due to uptake of such radioactive elements as Sr-90 and Cs-137 will be studied.

9. Geophysical Distribution of Bomb-Produced C-14. (M. S. Plesset)

The aim of this project is to review the current status of models suitable for describing the distribution of bomb-produced C-14 in the atmosphere, the hydrosphere, the lithosphere and the biosphere. A preliminary draft of a report covering this work has been written and is currently being revised and extended. Three different models for the exchange between the various carbon reservoirs have been compared. The most recent model is that used by H. Craig which, in addition to using exchange rates between the troposphere and the mixed layer of the oceans used in previous models, permits direct exchange between the troposphere and the deep sea reservoir. It seems reasonable that this effect would reduce

the long term integrated effect in the biosphere of any sudden excess of C-14 introduced into the atmosphere by a nuclear war.

10. Disaster and Recovery: The Black Death in England and France. (J. Hirshleifer)

This project explored the socio-economic aspects of recovery from the Black Death epidemics in England and France to seek possible generalizations which may suggest means of recovery from the consequences of nuclear war.

The study is essentially complete and a first draft report is being written.

11. Postattack Demography. (I. S. Lowry)

This is a study of the long-run demographic consequences of a nuclear attack on the United States. To date the work has involved background research for the purpose of framing and focusing the study. Also contacts with persons engaged in similar research at other institutions have been established.

The first product is expected to be an essay discussing the principal variables needed to forecast postattack demographic events, the intrinsic limits on such forecasts, and their possible uses to aid postattack recovery.

12. Sensitivity Analysis of Damage Assessment Predictions to Grid-lumping Procedures and Assumptions. (B. F. Goeller)

We propose to use a modification of the Quick Count Model to estimate the sensitivity of damage calculations to grid-lumping procedures and assumptions, such as grid size. This study will complement M. E. Arnsten's work, under item 7 above, on the sensitivity of damage estimates to uncertainties in a number of input parameters. Progress to date has been limited to problem formulation.

13. Possible Application of Systems Analysis to Rank Policy Alternatives of Interest to TAB. (B. F. Goeller)

The object of this study is to search for a criterion for ranking various policy alternatives in order of preference relative to desired objectives. This project was initiated only recently and will continue into the next contract period.

14. Possible Objectives of a Policy to Manage the Postattack Biosphere. (B. F. Goeller)

This study will examine possible objectives of a policy to manage the postattack biosphere and the problem of choosing among alternative policies by relating costs to objectives. A preliminary draft of an essay on this topic is near completion.

Research Plans

With the exception of the survey of postattack flood problems, which is finished, all of the other items are continuing projects. Projects 5, 11, 12, 13, and 14 were initiated during this contract period.

Personnel Status

During this reporting period B. F. Goeller, Y. H. Katz and I. S. Lowry joined the RAND-TAB group. M. E. Arnsten, E. S. Batten, S. N. Blumenfeld, N. D. Cohen, N. A. Hanunian, D. Hatch, J. E. Hill, J. Hirshleifer, R. E. Huschke, H. H. Mitchell, J. W. Neel, M. S. Plesset, R. R. Rapp, D. T. Rumford and R. D. Specht continued to be active.

ENCLOSURE 8

Outside Experts Consulted from Time to Time by the Technical Analysis Branch

Argonne National Laboratory
Argonne, Illinois

Dr. Douglas Grahn, Associate Director,
Division of Biological and Medical Research
Dr. George A. Beckner, Division of Biological
and Medical Research

Brookhaven National Laboratory
Upton, Long Island, New York

Dr. Victor P. Bond, Chairman
Medical Department
Dr. E. A. Conard, Medical Department
Dr. Eugene P. Cronkite, Medical Department
Dr. Arnold Sparrow, Biology Department

Colorado State University
Fort Collins, Colorado

James M. Shively, D. V. M., Collaborative
Radiological Health Animal Research Laboratory

The Jackson Laboratory
Bar Harbor, Maine

Dr. John Storer, Geneticist

The Lovelace Foundation
Albuquerque, New Mexico

Dr. Clayton S. White, Director of Research

Battelle-Northwest - Pacific Northwest Laboratories
Richland, Washington

Dr. Leo Buzzed, Biology Department
Dr. Lee Eberhardt, Biology Department

University of California
Los Angeles, California

Dr. Joseph V. Rose, Chairman, Laboratory of
Nuclear Medicine and Radiation Biology
Dr. William Martin, Laboratory of Nuclear
Medicine and Radiation Biology
Dr. Fred Turner, Laboratory of Nuclear
Medicine and Radiation Biology

United Kingdom Medical Research Council
Harwell, Didcot, Berkshire, England

Mr. Robin Mole, Radiobiological Research Unit

University of Rochester
Rochester, New York

Dr. Henry S. Slade, Director, Atomic Energy
Project, School of Medicine and Dentistry

~~O-M-J-CAE~~ M H S.3 Radiation Fallout

MAR 26 1965

MEMORANDUM FOR CHAIRMAN SEABORG

SUBJECT: JCAE CORRESPONDENCE

This is in reference to recent discussions concerning the list of RAND Corporation personnel which had been furnished to the Joint Committee on Atomic Energy

The attached memorandum from the Office of Congressional Relations outlines procedures for furnishing your office with copies of correspondence addressed to the JCAE. As noted in the attached memorandum steps are being taken to continue this procedure on a more current basis.

In regard to material furnished the JCAE at the time corrected transcripts are returned to the Committee we are having the master copies of recent transcripts reviewed and copies of all pertinent information which has been supplied for insertion in the record will be furnished your office. We plan in the future, at the time the transcript is returned to the JCAE, to supply your office with copies of pertinent data that has been included in the transcript.

In regard to furnishing copies of JCAE correspondence to the other Commissioners the Office of Congressional Relations is currently checking with the Commissioners' offices to determine the extent and type of JCAE correspondence that they desire furnished on a current basis. Through this means we hope to supply the other Commissioners JCAE correspondence in areas of particular interest to them.

Signed:
John V. Vinciguerra

for General Manager

Attachment
As stated O-M 7-JCAE
C&R-2

Secretariat

cc: ~~D.A.Ink, ACE~~

OFFICE ▶	J.V.Vinciguerra, EA/GM					
SURNAME ▶	OCR O'NEILL:awd	EA/GM	AGM	DGM	GM	
DATE ▶	3/26/65					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

3-26-65

GSA GEN. REG. NO. 27

UNITED STATES GOVERNMENT

Memorandum

TO : John V. Vinciguerra, Executive Assistant to the General Manager

DATE: March 24, 1965

FROM : Robert D. O'Neill
Office of Congressional Relations

Original signed by R. D. O'Neill

SUBJECT: JCAE CORRESPONDENCE

This memo is in response to your request for information as to procedures followed by this office in furnishing the Chairman copies of correspondence going to the Joint Committee on Atomic Energy.

Since early 1961, following a request from the Chairman's office, we have been making copies of correspondence addressed to the JCAE regardless of who had signed the correspondence. These copies as they accumulate over several days period are sent to the Chairman's office (of course, this would not include correspondence that the Chairman signed). In response to a more recent request from the Chairman's office we are amending our procedure whereby we plan to have the originator of JCAE correspondence prepare an extra copy for the Chairman. These copies will be sent on a daily basis to the Chairman.

In response to your second question as to how the list of RAND Corporation personnel was furnished the JCAE I have looked at the transcript of the February 16 Authorization Hearings at which Dr. Dunham testified. During the hearings Mr. Holifield asked Dr. Dunham if he could supply a breakdown of RAND Corporation personnel. Dr. Dunham said he would be glad to and the list was inserted in the corrected transcript when it was returned to the Committee.

MHS 3

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

MAR 25 1965

MEMORANDUM TO COMMISSIONER RAMEY

THROUGH: GENERAL MANAGER MAR 26 1965

SUBJECT: RADIATION BENEFIT TO HUMAN RACE

This is in response to your request for comments concerning a newspaper article and a note by Dr. Francis J. Jankowski of Rutgers University, published in the Speculative Papers section of the American Nuclear Society Journal of November 1964.

There have been numerous suggestions since radioactivity was discovered that ionizing radiation might be directly beneficial to living organisms beginning with the claim that the heart beat may be initiated by radioactive decay of thorium and potassium in blood and heart muscle.

Dr. Hugh F. Henry summarized the then available data concerning possible effects on the life span of low levels of radiation in the May 27, 1961, issue of the Journal of the American Medical Association, pages 671-675. His preliminary paper was referred to by Dr. Jankowski. Since that time there has been some additional information concerning possible beneficial effects of radiation. In general, animal experiments have indicated that low levels of radiation of the order of one-tenth rad per day in continuous or semi-continuous dosage tends to increase slightly the average life span of a group of animals. The mechanism for this is as yet unknown. There have been numerous reports in popular literature that plant growth is stimulated by small doses of high energy radiation. However, plant experiments when carefully controlled indicate that there are no statistically significant effects, either deleterious or beneficial, of low levels of radiation such as have appeared in animal longevity studies.

Some studies supported by the Atomic Energy Commission have been made on survival under natural conditions of irradiated populations of fruit flies and of rodents. In the case of the fruit flies, the irradiated population (the radiation exposure was relatively high because of the greater resistance of insects to x-rays) proved to be less viable than the unirradiated controls, whereas, in the case of the rodents the irradiated population (200 r to females) appeared to be somewhat more resistant than their unirradiated controls.

Copy filed
MHS 18

3-26-65

Dr. Lauren Donaldson of the University of Washington has subjected young salmon to radiation and found that more of these than of the controls returned to their spawning grounds and that the returning irradiated salmon were statistically slightly larger than the unirradiated controls. Since the number returning of both controls and irradiated fish is of the order of one to three percent of those liberated into the ocean, it is difficult to know what significance to attach to these data.

Dr. Jankowski suggests two ways in which studies might be conducted to determine the possible beneficial effects of radiation directly on organisms. From the above it is clear that his first suggestion is being carried out quite amply and many of the studies referred to above were supported by the U. S. Atomic Energy Commission.

His second suggestion that a sytematic study of the effect of withholding radiation from a biological system be attempted is not at this time feasible. One such study has been attempted. In this study potassium ^{40}, one of the larger sources of internal radiation, was removed laboriously from the nutrient medium in which a one-celled organism was grown. Bizarre effects were reported and attributed to the lack of radiation from potassium ^{40}. However, it was not clearly established that the potassium 39 from which potassium ^{40} had been removed by subjection of natural potassium to a mass spectroscopic treatment was sufficiently purified to assure that no adventitious contamination had affected the results. This investigator was supported for several years by AEC, although this specific study was not part of his AEC project.

The actual control of an organism in a totally irradiation-free medium would require not only low activity shield walls but removal of carbon ^{14}, potassium ^{40}, tritium and other traces of radioactive materials from all of the media or foods and in the case of animals would require the rearing of several generations to reduce a maternal transfer. At the present time, the expense of such a procedure could hardly be warranted by the results that might be expected.

Dr. Henry has carefully discussed and distinguished somatic and genetic effects in his article in the JAMA. This is necessary since even though the somatic effects of low levels of radiation might be beneficial to the organism irradiated there would accumulate in its genetic material mutations which in the long run might prove harmful to its descendants.

It is not impossible, however, that certain genetic effects might also be beneficial. It is well known that the particular genetic constitution of an organism is the result of adaptation of the species to the existing environment. If the environment were to change rapidly then an increase in mutation rate or a high genetic load might provide the variability necessary to permit the species to survive under conditions where otherwise it might not. In addition, individuals of certain species appear to be more vigorous when carrying a greater load of mutations than when the load is lower (heterosis). The success of hybrid corn is an outstanding example of this sort. Seed from hybrid corn, however, is not useful for breeding purposes.

Since quantitative information about human mutation loads is very difficult to obtain, it is not known whether human populations in general have an optimum load of mutations, whether in fact there may not already be too many or whether the race would be better off with more or with none. The AEC is supporting an extensive program in genetics in an effort to answer just such questions.

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

cc: Commissioner Bunting

bcc: Secretary (2)
GM
ACMHD
BMA
ADR

BMA	ADA		
	HAStanwood		
3/ /65	3/ /65		
ADR	DIRECTOR	GM	
JRTotter:jmh	CLDunham		
3/24/65	3/ /65	3/ /65	

MH-5-3

March 23, 1965

[redacted]

[redacted] Signed:
John V. Vinciguerra

SUBJECT: "Fundamental Nuclear Energy Research - 1964" Report

The attached translation seems to be the Japanese newspaper article which was responsible for the recent request by the Ministry of Health Welfare for a copy of our report entitled "Fundamental Nuclear Energy Research - 1964."

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

Attachment
Translation

cc: DM

TRANSLATION

Chugoku Press

11 March 1963

USAEC REPORTS A-BOMB DISEASE IN HIROSHIMA AND NAGASAKI

Increase of Leukemia and Cancer Found on Basis of ABCC Data

(Washington, 10 March, AP-Kyodo) The U. S. Atomic Energy Commission released on 10 March that "although the number of thyroid carcinoma cases is small, there is a definite increase among A-bomb survivors in Hiroshima and Nagasaki."

This announcement is based upon the latest report from ABCC operated jointly by the AEC, National Academy of Sciences and the Japanese Institute of Public Health. The main points included in the announcement are as follows:

1. Definite increase in leukemia incidence (although the actual number of cases is small).
2. Increase in such ocular abnormalities as proliferation cataracts.
3. Tendency of mental retardation among children exposed in-utero.
4. A slight but definite increase in thyroid carcinoma seen among heavily exposed persons.

It was said that other effects, even if present, are difficult to evaluate due to their small magnitude.

ABCC is investigating 120,000 residents of Hiroshima and Nagasaki who were exposed within 1945 m from the hypocenter to determine the effects of the A-bomb, death rate, causes of death, etc. and performs a medical examination once every two years on a sample of 20,000 persons.

Persons concerned Request that Measures for A-bomb Survivors should be Expedited

Actual Condition Must First be Grasped

In connection with the release made by AEC on 10 March that "thyroid carcinoma and leukemia are increased in A-bomb survivors," the desire for "promotion of measures to provide complete medical care and livelihood assistance" has increased among the survivors.

According to Dr. Toshiyuki Kumatori (Chief, 1st Clinical Laboratory, National Institute of Radiological Sciences) who had engaged in the treatment of the members of the No. 5 Fukuryu-maru, the relation between the A-bomb and cancer or leukemia has been reported before, but this is the first time that it has been elucidated statistically.

According to the investigation by the Welfare Ministry, there are approximately 260,000 A-bomb survivors throughout Japan, of whom about 90% live in Hiroshima and Nagasaki. Treatment of A-bomb survivors has been done at various hospitals under the A-bomb Survivors Medical Treatment Law since 1957, but the actual health status of A-bomb survivors throughout the country is unknown. The Welfare Ministry was making preparations to plan a nationwide survey on the actual status after consulting with the A-bomb Survivors Medical Treatment Council. A person concerned at the Ministry said, "The U. S. was a step ahead of us in making a report, but after investigating the actual status of A-bomb survivors, measures for the treatment and welfare of survivors will be improved."

The Japan A- and H-bomb Prohibition Council said as follows:

"In January, the U. S. Radiation Scientific Committee issued a report based on the investigation of Hiroshima and Nagasaki A-bomb survivors that the risk of leukemia among in-utero exposed cases is several times greater than in adults and emphasized the danger due to radiation. This year is the 20th anniversary of the A-bomb and petitions have submitted to various quarters for the enactment of a law providing complete relief for A-bomb survivors and the establishment of an organ to study radical treatment methods for A-bomb sickness. We would like to have the Welfare Ministry take up our petition on the basis of the report of ABC (sic) without waiting for the results of the nationwide survey."

7n H.S 3

MAR 22 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BURTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

THROUGH GENERAL MANAGER Signed: John V. Vinciguerra MAR 23 1965

SUBJECT: THYROID DISEASE IN RONGELAP ISLANDERS

This is to advise you that during the current annual medical survey of the Rongelap people, Dr. Robert Conard has turned up two more individuals with thyroid tumors, two boys ages 12 and 17, making a total of five (two male and three female) among those who were children at the time of exposure. In addition, there is one woman 41 years of age who was found to have what appears to be a solitary thyroid nodule.

The Journal of the American Medical Association has accepted for publication an article by Dr. Conard summarizing 10 years of observations on the Rongelap people and which includes information on the three cases of thyroid tumor noted last year. It is expected that this article will appear within the next few weeks.

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

cc: Secretariat (2)
GM
AGMRD
BMA

P.S. The Joint Committee is being informed of the above.

DIR B&M	AGMRD	EA/GM	GM
3/22/65	3/ /65	3/ /65	3/ /65

3-22-65

MH.S 3

MAR 19 1965

MEMORANDUM FOR COMMISSIONER RAMEY

THROUGH GENERAL MANAGER Signed: John V. Vinciguerra MAR 19 1965

SUBJECT: LEVELS OF CESIUM-137 IN ALASKA AND CANADA

This is in reply to your memorandum, subject as above, of March 5, 1965, in which you requested staff review and comments in regard to two editorials and an article in SCIENCE. Copies of these are attached.

Fallout predictions following nuclear tests in 1961 and 1962 are in reasonably close agreement with observed fallout levels, as indicated in Federal Radiation Council reports Nos. 4 and 6. The problem of significance in this regard is the special case of one Eskimo village, Anaktuvuk, in Alaska. Although the amount of fallout deposited per unit area in the Arctic is about one-fifth as much as that deposited in the 30° - 40° latitude band, a combination of ecological conditions and specific dietary habits of the Eskimos and Indians causes higher strontium and cesium body burdens than are found in conterminous United States. While it was recognized from the first Chariot surveys that Anaktuvuk would be a more critical area than coastal villages accurate quantitative predictions have not been possible since there is little experience with the specific long-term food-chain which is essentially limited to this small inland village. For this reason no predictions were made.

The high levels of cesium-137 in these people are due to their very high consumption of caribou flesh. The caribou and reindeer accumulate higher levels of this radionuclide than other herbivores because of their unique habit of feeding upon lichens and other plants which retain the fallout cesium due to their structure and growth habits. Caribou flesh is a dominant food of the Anaktuvuk people throughout the year whereas dominant foods in the diets of Eskimos at other villages include other animals such as seal, walrus, whale and fish. It is expected that the cumulative cesium-137 in lichens will continue to increase during 1965, and perhaps during 1966, and that these high levels may then persist for several years. The levels in the people will fluctuate seasonally depending on levels in caribou meat. The levels in caribou peak at the end of the winter when lichen is the sole source of food. The levels tend to drop in the summer as other foliage becomes available. The highest individual reading on any Alaskan Eskimo to date was 2,430 nanocuries in July 1964.

3-19-65

Cesium-137 counts that were made of Anaktuvuk natives during January 21-22, 1965, have just been calculated. Below is a complete summary of the measurements to keep you currently informed.

Total Body Burdens of Cs-137 in Anaktuvuk Eskimos

Subject	Number measured	Nanocuries of Cs-137 Average	Maximum
Special study group of adult males	25	640	970
Total adults	41	660	1350
Juveniles (16-20 years)	12	390	730
Children (under 16 years)	30	86	220

For your guidance, the FRC Radiation Protection Guides set 3,000 nanocuries as an upper limit for Cs-137 in individuals and 1,000 nanocuries as the average population dose.

As you know, the Federal Radiation Council is preparing Radiation Protection Guides applicable to fallout situations. The Council believes that the current guides are not applicable to such situations, and there is specific reference to the Alaska problem in the draft report. It is our understanding that these FRC Guides will be less restrictive than the existing guides developed for the control of normal peace-time uses of nuclear energy. It is my hope that these levels, though higher than the existing guides, referred to above, would carry a risk so small as to be essentially below any danger point. The Public Health Service has begun a broad surveillance program in Alaska through which we will be able to observe future trends in fallout nuclide levels.

It is certainly true that in the event of a nuclear war the Cs-137 levels in people living within the Arctic Circle and subsisting principally on caribou and reindeer meat would be critical.

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

Attachments:
3 clippings

cc: Commissioner Bunting
Commissioner Tape
General Manager
Director of Regulation

bcc: ACRSD
Secretariat (2)
RMI
WSB

TORONTO STAR JANUARY 23, 1965

Fallout: danger to be faced

Toronto 1-23

The Department of National Health and Welfare has disclosed that levels of cesium 137, one of the more lethal of radioactive by-products, are increasing in large areas of the north and are approaching the danger point for human beings.

What has happened, apparently, is that northern lichens have absorbed and concentrated radioactive cesium. Further concentration has occurred in the flesh of caribou which eat the lichens. This, in turn, has created a hazard for Eskimos and Indians who live mainly on the caribou.

This situation is presumably the result of test explosions before 1963 and illustrates the grim persistence of some radioactive substances. Unfortunately we no longer have any assurance that there will be no additional fallout — even if Russia and the United States continue to honor the test ban treaty. France has continued testing and now China, having developed its own atom bomb, has started what may be a long series of test explosions.

Canada has to face the fact, therefore, that it has a continuing health problem. The Canadian government, which has adopted a rather Pollyannish attitude in the past, must take stronger measures to meet it.

The first requirement is more accurate knowledge of just what radioactive materials are descending on Canada and where they are concentrated. At the present time the department of health and welfare, through the meteorological service, collects and tests air samples. These samples are mainly taken, however, at the larger airports where the meteorological service maintains staffs. This method provides little or no information about conditions in areas away from the airports. A much more extensive system of testing stations is needed.

The department also tests milk and wheat for contamination by radioactive materials, but it does not test other food products or even water supplies. It should do so.

Once the facts about fallout in Canada are determined, remedial measures can be taken. Contaminated milk and water supplies can be purified of cesium 137 strontium 90 and similar radioactive substances by a process similar to water softening. It is safe and cheap; it has been estimated that it would add only from half a cent to a cent per quart to the cost of milk. In the case of other foodstuffs, methods are known by which the absorbtion of dangerous radioactive substances from the soil by crops and by cattle and other food animals can be slowed down.

The situation disclosed in the north presents a special problem. Probably the only solution is either to provide the Indians and Eskimos with an alternative food to caribou meat or else move them out of the contaminated areas altogether.

WASHINGTON POST FEBRUARY 14, 1965

Wash. Post 2-14-65

More on Fallout

Disclosure in the authoritative journal *Science* that radioactive fallout in the bodies of northern Alaska Eskimos has doubled in the last two years is an alarming piece of information. This discovery of the increased amounts of cesium-137 is disquieting for its effect on the Eskimo (even though authorities think the amount would have to be five times as great to be a menace) and it is disturbing as a forecast of what might happen in the event of heavy radioactive fallout from renewed testing or from actual atomic war.

And this is so because the increase was not anticipated and is expected now to continue into the future. Cesium-137 emits radiation to the whole body and particularly to fat and muscle. Science miscalculated the effects of early testing in two ways. The fallout was expected to diminish more quickly and the food chain effect was not fully anticipated. This latter phenomenon promises to make the health hazards of any fallout protracted.

The northern lichens collect the fallout and the caribou eat the lichens and the Eskimos eat the radioactive caribou meat. How long might such a cycle last in the event of thermonuclear war? It is horrifying to think of how persistent this sort of radiation might be in the event of heavy and protracted fallout. The farther we part the veil of ignorance that has limited our knowledge of this phenomenon the more appalling the prospect appears.

8

Science 265

...ity Measured in ... Natives, 1962–1964

Abstract. Measurements of the ce... ...ent of northern Alaskan ... the summer of 1964 in... the adults of the interior ... Anaktuvuk Pass had the ... average body burden: 1280 ... of cesium-137. This is an ... 200 percent over the aver... ... burden found in the summer ... and 100 percent over that ... summer of 1963. The ... burden found in a native in ... was 2.4 microcuries of cesium-137, but the highest burden of all, 3.0 microcuries, was measured in a non-native living mainly on caribou meat. ... found in samples of ...mos, and subsequently ... themselves and in ... and caribou meat.

... measurements of the ... in northern Alaskan na... have been made since the sum... 1962 (1) by means of a port... ...body counter. The most re... measurements, made in July 1964, indicate that the amount of Cs^{137} in Eskimos has increased since the summer of 1962.

... Table 1 the results obtained dur... the summers of 1962, 1963, and ... for adults (15 years and older) are compared. By 1964 the average body burden in Eskimos of Anaktuvuk Pass had increased by more than 100 ... since 1963 and by more than ... since 1962. The Cs^{137} ... of people in other villages had also increased. Because caribou meat ... eaten only sporadically at Barrow ... and Fort Yukon, and because the body ...dens in these people were not approaching equilibrium with the caribou component of their diet, measurements were discontinued in these two villages. Anaktuvuk Pass usually has abundant caribou meat (2) and the average burden of people in this village is more directly related to the amounts of Cs^{137} in caribou. A man from Anaktuvuk Pass had the highest amount of Cs^{137} found in an Eskimo: 2.4 μc. However, a burden of 3.0 μc was measured in a non-native living in the small village of Ambler; his diet consisted mostly of caribou meat.

Similar increases in body burdens of Cs^{137} have been measured in Swedish Lapps by Liden and Naversten (3) and in Finnish Lapps by Miettinen (4). The maximum body burden measured in northern Finns was 2.66 μc in April 1964.

Measurements were again made on children (4 through 14 years) in Alaska this summer; their body burdens were consistently lower than those of adults. In adult females the burdens were still about two-thirds as high as in adult males; in children the burdens were about one-fourth as high as in adult males. The average body burden of children at Anaktuvuk Pass was 341 nc, which is a 50 percent increase over the average for 1963.

This summer, Cs^{137} was measured in the native Athapascan Indians of Arctic Village for the first time; their body burdens were higher than those of people from any other village except Anaktuvuk Pass. Since caribou meat makes up a large part of their diet except in summer (they do not practice meat storage through the summer as the Anaktuvuk Pass people do), their body burdens were probably higher during the spring; when measurements were obtained in July, the Indians of Arctic Village had not eaten caribou for several weeks.

Frequent measurements since January 1964 of the Cs^{137} content of Eskimos at Anaktuvuk Pass indicate that the average body burden of these Eskimos changes by as much as a factor of two during the year. The highest burdens of Cs^{137} occurred during July; the lowest occurred in the winter months. Monthly samples of urine from people in the coastal village of Point Hope show that here maximum burdens occur during the winter and minimum burdens during the summer. That this cycle is the reverse of that at Anaktuvuk Pass may be ex...ned by differences in methods of meat storage and in the seasons for killing caribou at the two villages. Details of this study will be published elsewhere.

In about January 1964, we began to find Na^{22} in samples of urine obtained from people at Anaktuvuk Pass. Samples of caribou meat showed that there was enough Na^{22} in the meat to account for the amounts found in urine. The concentration of Na^{22} in the urine appeared to increase during March and April and then to level off; the maximum concentration found in a urine sample was 0.97 nc per liter, which indicates that the body burden of Na^{22} in the donor must have been about 17 nc. When the whole-body measurements obtained in July for ten people with the highest Cs^{137} body burdens were added together, no Na^{22}-peak could be detected; this group average was equivalent to an average burden of about 12 nc. For comparison, the Na^{22} concentration in urine from Richland, Washington, was about 0.01 nc per liter in April 1964. Samples of caribou and reindeer meat obtained before the summer of 1963 contained very little Na^{22}, indicating that fallout from the latest nuclear tests contains much more Na^{22} than fallout from tests conducted before 1961. Similar results were obtained by Perkins and Nielsen (5) who measured the Na^{22} content of samples of foods and urine.

The concentration of Cs^{137} in the air at Richland, Washington, during the first half of 1964 was only about 30 percent less than the concentration during the same period in 1963 (5). If similar deposition rates occur in Alaska, and if it is assumed that this rate of deposition will continue to be greater than the rate of loss of Cs^{137} from the lichen component of the food chain, the amounts of Cs^{137} in caribou meat and Alaskan natives can be expected to increase next year.

HARVEY E. PALMER
WAYNE C. HANSON
BOBBY I. GRIFFIN
LESLIE A. BRABY

Hanford Laboratories,
General Electric Company,
Richland, Washington

... amounts of Cs^{137} in adult (aged 15 ...) Eskimos and Indians of Alas... ...timated by means of a portable ... counter.

...	Cs^{137} (nanocuries)	
	Average	Maximum
Summer 1962		
... Pass	421	790
...	138	518
...	52	166
... Hope	17	119
Summer 1963		
... Pass	628	1240
...	140	732
...	60	177
...	39	88
Fort ...	34	181
Summer 1964		
Anaktuvuk Pass	1280	2400
Kotzebue	321	929
Point Hope	50	92
Arctic Village	614	1156

References and Notes

1. H. E. Palmer, W. C. Hanson, B. ... W. C. Roesch, *Science* 142, 64 (1965); H. E. Palmer, W. C. Hanson, B. I. Griffin, D. M. Fleming, *ibid.* 144, 859 (1964).
2. W. C. Hanson, H. E. Palmer, B. I. Griffin, *Health Phys.* 10, 421 (1964).
3. K. Liden and Y. Naversten, paper presented at

[redacted]

MH-S-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

FEB 17 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

THROUGH GENERAL MANAGER

SUBJECT: REPORT ON ALPACA

CLASSIFICATION CANCELLED*
BY AUTHORITY OF DOE/OC
N Hoppe 12/12/85
REVIEWED BY DATE
J Diaz 2/4/86
REVIEWED BY DATE
* W/O Attachment
By: J Hall 2/24/86

In accordance with your request, I am attaching a report to Mr. Bundy on the release of radioactivity to the atmosphere as a result of the ALPACA test.

CONFIRMED TO BE UNCLASSIFIED
DOE NSI DECLASSIFICATION REVIEW E.O. 12958
BY: [redacted] DOE/NN-523 12-28-95

(signed) Delmar L. Crowson

Delmar L. Crowson
Brigadier General, USAF
Director of Military Application

Attachment:
Report on ALPACA

SOS:CC: Chairman
CC: Com. Bunting
CC: Com. Palfrey
CC: Com. Ramey
CC: Com. Tape
2CC: Secretariat
CC: Gen Mgr
CC: Dir Ref
CC: DGM
CC: Test Reader
CC: Reader
CC: Locator
CC: DMA Files
CC: Test Pending

When separated from enclosures, handle this document as [redacted]
(Insert proper classification)

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cy fwd MR+A-7- 2nd request

2-17-65

CROSS-REFERENCE *(Name, number, or subject under which this form is filed)*		MH&S 3-
IDENTIFICATION OF RECORD	DATE	
	TO	
	FROM	
	BRIEF SUMMARY OF CONTENTS	A mount of Radioactivity released by the 1-15-65 USSR shot. U.S. weather bueau has made a calculation based on the radioactivity concentrations collected by air samplers in Japan of the amount of radioactivity ~~vented~~ by the USSR shot.
FILED *(Name, number, or subject under which the document itself is filed)*		MR&A 7- USSR date 2-1-65

3-1-65

mHS-3

January 6, 1965

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER HUNTLEY
COMMISSIONER PALMER
COMMISSIONER LUCE
COMMISSIONER ZARB

GENERAL MANAGER John V. Vanderwende

SUBJECT: FURTHER INFORMATION ON THREE METASTASIS GIRLS OPERATED ON FOR REMOVAL OF THYROID NODULES (SEE ATTACHED COPY OF PREVIOUS MEMO, THIS SUBJECT).

Dr. Robert A. Conard, Medical Department, Brookhaven National Laboratory, who has responsibility for conducting the clinical surveys, reports: "Sections of the nodules have been examined by a number of pathologists including Drs. B. Warren, W. B. Mims, E. J. Johnson and S. Lindsay. The consensus is that the nodules are benign, though with certain bizarre areas, and resemble iodine deficiency nodules."

Dr. Lindsay noted that the nodules in the Bengalese areas are similar to ones he has seen in children following I[131] therapy. This Division has a file of Dr. Lindsay's histological reports and a review paper by Lindsay and Chaikoff, Cancer Research, 24:1107, 1964.

The radiation dosages which these children's thyroids may have received are being re-evaluated by Dr. John Gofman's group, Lawrence Radiation Laboratory.

It should be added that nodules in the thyroid glands of young people frequently become malignant in the course of time. Therefore, while those which were removed promptly after discovery were not malignant, there is a chance that in time they might have assumed neoplastic characteristics. Dr. Conard's next clinical survey will take place in February 1965.

C. L. Dunham

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

cc: Secy (2)
GM (2)
ACMRD
BMA
ADMBR

Attachment:
Copy of memo dated 12/2/64
from C. L. Dunham to Chairman Seaborg

BMA	ADA
1/ /64	1/ /64

ADMBR DIRECTOR

HUBruner:pwg CLDunham
1/6/64 1/ /64

DECLASSIFIED

COPY

October 2, 1964

MEMORANDUM FOR CHAIRMAN SEABORG

THROUGH GENERAL MANAGER

SUBJECT: THYROID DISEASE IN ROMELAP ISLANDERS

During the February 1964 annual medical survey of the Marshallese Islanders exposed to fallout from the March 1, 1954, shot over Bikini, three young teenagers, 13-14 years old, were found to have nodules in their thyroid glands. The medical team felt that two of them should have immediate thyroidectomies, and these operations were successfully carried out at the Naval Hospital on Guam with the full cooperation of the Trust Territory people and the medical services of the Department of Defense.

The pathological diagnoses were papillary adenocarcinoma, a malignant tumor of the thyroid. The prognosis, of course, is uncertain, but the surgeons are reported to have felt that they may have removed all the neoplastic tissue. While this information has not been transmitted formally, it is regarded as reliable. It is planned that a ten year summary of the health status of the exposed Marshallese, including these recent developments, will be prepared for prompt publication in a prominent journal such as the Journal of the American Medical Association.

Preparations are now going ahead to have the third child with a small nodule operated on as soon as possible. The estimated doses to these thyroids are some 100 to 175 rads external gamma plus 100 to 150 rads from absorbed radioiodine.

COPY

October 2, 1964

Since the spontaneous occurrence of two, and possibly three, cases of thyroid neoplasm among the small number of exposed Marshallese children is most unlikely, these observations will probably give rise to comment in various quarters. For this reason, it seems desirable to consider this matter as tentative until the documented data are in hand. You and the Commission will be informed promptly at that time.

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

cc: Commissioner Bunting
Commissioner Palfrey
Commissioner Ramey
Commissioner Tape

Mtg. No. S-3

[redacted] Res. & Status Br. - GTN

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: December 30, 1964

FROM : W. B. McCool, Secretary

Original signed W. B. McCool

SUBJECT: PHS PAPER ON FALLOUT FROM UNDERGROUND NUCLEAR TESTS

SECY:GF

At Information Meeting 438 on December 29, 1964, Mr. Bloch discussed briefly the problems presented by the submission of the paper, as discussed in Mr. Clark's December 11 memorandum, to SCIENCE magazine and PHS for publication. He proposed to discuss the matter as soon as possible with PHS representatives and with the White House and commented on the need to point out to the White House the problems raised by EO 10501 in terms of its application to material not under the control of the AEC. Mr. Ink suggested telephoning Dr. Terry, Surgeon General, prior to discussion with PHS representatives and the Commissioners agreed this should be done. Staff will report back to the Commission the results of that discussion.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Asst. Gen. Mgr. for Admin.
General Counsel
Director, PI
Director, Military Application

CONFIRMED TO BE UNCLASSIFIED
AUTHORITY: DOE - DP/OC
BY: H Hoppe DATE: 12/12/85
By J. Hahn 2/28/86

12-30-64

Copy to Ad:
Mtg. No. S-3 Underground 64

[redacted]

CROSS-REFERENCE *(Name, number, or subject under which this form is filed)*		MH&S 3
IDENTIFICATION OF RECORD	DATE	
	TO	
	FROM	
	BRIEF SUMMARY OF CONTENTS	Memo to the Commission by Dir. B&M forwarding Trip Rpt by Dr. K. Z. Morgan, Oak Ridge, on Pro Tempore General Assembly for Formation of an International Radiation Protection Association.
FILED *(Name, number, or subject under which the document itself is filed)*		Security 4-5 Visits to Foreign Countries date of memo: 12-24-64

12-24-64

MHOS-3

12-6-63-5M (3B1-59)

STATE OF NEW YORK
EXECUTIVE DEPARTMENT

OFFICE OF ATOMIC AND SPACE DEVELOPMENT

ALBANY

P.O. BOX 7036

December 24, 1964

The Honorable W. Willard Wirtz
Secretary
Department of Labor
Washington, D. C.

Dear Mr. Wirtz:

As you know, the U. S. Department of Labor has promulgated regulations establishing "Radiation Safety and Health Standards" applicable to employers who are subject to the Walsh-Healey Public Contracts Act. As you may recall, New York and five other states that have signed regulatory agreements with the U. S. Atomic Energy Commission--known as Agreement States--objected to the Department's imposition of these additional standards in their respective states where radiation safety and health were already being achieved through state programs for radiation control; the specific views and recommendations of the representatives of the six Agreement States were contained in a joint letter addressed to you and dated December 6, 1963.

The Department of Labor, in publishing a notice of public hearing, stated that the regulations would not be applicable in the six Agreement States--Arkansas, California, Kentucky, Mississippi, New York, or Texas--until "appropriate orders" are issued after opportunity for a hearing on why special provisions should be included exempting Walsh-Healey employers in Agreement States. Since the April 1964 hearing, the record of which was closed on June 17, 1964, this Office has inquired as to the status of the Department's findings and as to when "appropriate orders" would be issued. The response to date appears to indicate that this matter will not be resolved in the immediate future.

12-24-64

Copy filed: PFC-1-Reg N.Y. agreement

In the interim, three additional states -- Florida, Kansas, and North Carolina -- have entered into regulatory agreements with the Commission and it then appears appropriate that the U. S. Department of Labor publish a Notice in the Federal Register stating that the Radiation Safety and Health Standards will not apply to employers in the States of Florida, Kansas and North Carolina.

Moreover, at the present time there are at least eight additional states that are in advanced stages of regulatory agreement negotiation with the U. S. Atomic Energy Commission. It would, therefore, appear to be even more appropriate that the Department publish a general notice in the Federal Register stating that the Radiation Safety and Health Standards will not be applicable to employers in any state which now or in the future enters into an effective regulatory agreement with the U. S. Atomic Energy Commission until a final decision can be made with regard to special provisions for employers in such states.

As in the past, this Office remains ready and willing to meet with the U. S. Department of Labor to discuss problems that would be created if the Radiation Safety and Health Standards are to be applied to employers within the Agreement States.

Sincerely yours,

J. D. Anderson
Deputy Director

cc: Dr. Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission

Dr. Robert Helsby
New York State Department of Labor

All Agreement States

MH-S-3

NOV 27 1964

Dear Bill:

You will recall our correspondence in November and December of 1963 about the concern our Division of Biology and Medicine has for determining the radiation doses to the survivors of the Japanese explosions. This was prompted by an independent inquiry to you by Dr. Bentley Glass who was then Chairman of our Advisory Committee for Biology and Medicine. The medical findings are becoming quite conclusive but their meaning depends on our having the best possible estimates of the radiation doses and, of course, this depends on the weapon yield.

The data you supplied with your letter of November 12, 1963, agree very well with our estimates of the Nagasaki explosion, and we feel quite confident that the yield was 23 KT ± 2.

The reason I am writing again is to acquaint you with some of the work that has been done in the past year pertaining to the Hiroshima explosion.

Specifically, it would be useful to have any appropriate comment on the estimated accuracy of the pressure distance curves you prepared and the results of any work which might have been done to fit the data to curves from which one might derive total yield. Comments on the analysis of our pressure-time curve that you made immediately after the bombings would also be of help.

11-27-64

Copy for:
Com 7-AEC HQ

The enclosed memorandum and reports summarize our work to date. We would appreciate any information or comments you might add about our work.

Sincerely yours,

(Signed) Glenn T. Seaborg

Chairman

Sir William G. Penney
United Kingdom Atomic Energy Authority
11 Charles II Street
London, S. W. 1, England

Enclosures:
1. The Status of the Studies of the Yields of the Hiroshima and Nagasaki Bombs.
2. Memorandum No-4193-PR, Yield of the Hiroshima Bomb Derived From Pressure Record.
3. CEX-64.3, Ichiban: The Dosimetry Program for Nuclear Bomb Survivors of Hiroshima and Nagasaki - A Status Report as of April 1, 1964.
4. CEX-62.14, An Experimental Investigation of the Spatial Distribution of Dose in an Air-Over-Ground Geometry.

bcc: Chairman (2)
Secretary (2)
AGMRD
GM
EMA

EMA	ADA					
Brothers	Hammond					
11/ /64	11/ /64					
CEB	AD/RE/DBM	DIR/DBM	DGM	AGMRD	GM	
Peal:jw	Hemmer	Cleuning			-	
11/ /64	11/ /64	11/ /64	11/ /64	11/ /64	11/ /64	

THE STATUS OF THE STUDIES OF THE YIELDS OF THE HIROSHIMA AND NAGASAKI BOMBS
Prepared by the Division of Biology & Medicine
November 1964

The development of the Atomic Energy Program will continue to require that judgements be made interpreting the long term effects of radiation on man. Outside of limited experience with accident cases the best sources of human data are the survivors of Hiroshima and Nagasaki. The medical studies of the Atomic Bomb Casualty Commission have proved extremely successful. The findings are becoming quite conclusive but their meaning depends on having the best possible estimate of the radiation dose. It is only on these conditions that they will be fully interpretable or translatable to other situations where radiobiological effects are important.

Experimental work was done during the period of the nuclear weapons tests in the atmosphere and during Operation ENEU (Nare Reactor Experiment-Nevada) to determine the shielding against neutrons and gamma rays afforded by Japanese houses and the energy and angular distribution of the neutrons and gamma rays. The status of the dosimetry and shielding research and the energy-angular data are summarized in CEX 64.3 and CEX 62.14 (enclosed). Before the data can be used by the medical program in Japan, it will be necessary to normalize them with the data on the two bombs.

We are fairly confident of the yield of 23 KT ± 2 for the Nagasaki bomb. The associated calculations on the dose versus distance curves are believed to be the best we can obtain without further experimental work.

During the past year attention has been focused on making estimate of the yield of the Hiroshima explosion from data which were taken at the time of the bombing as well as from ground effects.

When it was learned that pressure measurements were made by use of canisters dropped over the two cities, it occurred that these early data might be interpretable in the light of 1964 weapons effects technology. The RAND report on "The Yield of the Hiroshima Bomb Derived From Pressure Record" is representative of the type of analysis that can be made today. Since this report was prepared, an extensive review of files, reports, and archives has been conducted. This was supplemented with interviews with key individuals associated with the Manhattan Engineering District, with a pilot who participated in both missions, and other key members of the technical team. Some of the questions raised by the RAND report have been answered as a result of this, i.e., there are available in the Los Alamos and U. S. Air Force files, weather data, bombing tables, and a considerable amount of information on the weapons.

A further step in the analysis of these data is an investigation of the methods for interpreting the ground effects in a manner which will permit the yields of the bombs to be estimated. The two pressure-distance curves prepared by Sir William Penney and reported in PWE 9, "The Blast Power of the Hiroshima and Nagasaki Bombs," are among the most complete and valuable

data available. His curve for Nagasaki fits very well with the 23 kiloton burst curve for the 1700-foot estimated height of burst. For Hiroshima the pressure-distance curve fits very well for a 14 kiloton detonation at an altitude of 1500 feet. This is 200 feet below the currently accepted height of burst for the Hiroshima explosion, but it seems to be within the limit of error of the determination.

Although attention has been focused on the determination of the total yield of the explosion, the radiation yield is the important parameter insofar as the interpretation of the medical effects is concerned. The radiation leakage of the Hiroshima weapon of course is not known, but an experiment is under way utilizing a mock-up of the weapon case and a U-235 critical assembly to provide a source of neutron and gamma rays. Measurements are now being made of the total radiation leakage and the neutron and gamma ratio.

A cooperative arrangement is under way with the staff of the U. S. Naval Ordnance Laboratory to make a more extensive analysis of the airborne-canister blast data along the lines started by Dr. Brode of RAND. Late in the Spring of 1965, measurements will be made at the Nevada Test Site utilizing a specially designed accelerator on the 1500-foot tower to provide data which will permit us to refine Monte Carlo radiation transport analysis and data on inelastic scattering.

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

NOV 2 1964

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: MAGAZINE WITHDRAWS FROM REQUEST TO ACCOMPANY HANFORD TEAM TO ALASKA

Reference is made to the memorandum signed by Mr. Vinciguerra, dated October 23, and its attachment, noting the request received by DPI from the Saturday Evening Post to have a writer-photographer accompany the next Hanford whole body counting team to Alaska.

Following Commission approval, and notification from Richland Operations that the team was gathering its gear, DPI telephoned Mr. Steven M. Spencer, science editor for the Saturday Evening Post. He expressed thanks for the cooperation he has received from the Commission but stated that the magazine's editors had given the matter further consideration. Despite their initial great interest, the editors have decided reluctantly, he said, that it will not be feasible to send a man on the trip.

The Post is going through an organizational crisis, and it may be that its internal problems contributed to this decision.

Signed
Duncan Clark

Duncan Clark, Director
Division of Public Information

cc: R. E. Hollingsworth, General Manager
H. C. Brown, AGMA
C. L. Dunham, Dir., DBM
M. R. Cydell, RLO
W. B. McCool, SECY

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

~~OFFICIAL USE ONLY~~ MHS-3

UNITED STATES GOVERNMENT

Memorandum

TO : File

DATE: October 30, 1964

FROM : W. B. McCool, Secretary

SUBJECT: MAGAZINE REQUEST TO ACCOMPANY WHOLE BODY COUNTER TEAM TO ALASKA

SECY:JCH

1. At Information Meeting 420 on October 29, 1964, the Commission accepted the General Manager's recommendation to fulfill the Saturday Evening Post request to send a writer and photographer with the next team leaving Hanford to measure cesium body burdens in the Eskimo population of Anaktuvuk Pass, Alaska. The Saturday Evening Post request was reported in Mr. Clark's October 20, 1964 Memorandum to the General Manager and in the latter's October 23, 1964 Memorandum for the Commissioners.

2. It is our understanding the Division of Public Information is taking the required action.

cc:
Chairman
General Manager
Deputy General Manager
Asst. General Manager
Asst. Gen. Mgr. for Admin.
Director, Biology & Medicine
Director, Public Information

~~OFFICIAL USE ONLY~~

AC-36-64

MH.S-3

October 29, 1964

MEMORANDUM FOR: Chairman Seaborg
Commissioner Bunting
Commissioner Palfrey
Commissioner Ramey
Commissioner Tape

THROUGH GENERAL MANAGER Signed: John V. Vinciguerra OCT 30 1964

SUBJECT: THYROID DISEASE IN RONGELAP ISLANDERS

I received the following telegram from Dr. Robert A. Conard, Brookhaven National Laboratory, concerning the diagnoses in the case of the thyroid tumors in the two Rongelap youngsters:

"Latest Armed Forces Institute of Pathology report says believe cases not malignant. Am sending slides and reports to Dr. Shields Warren for review. Patients doing well. Two discharged."

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

GM (2)
AGM
ACMRD
Secretariat (2)

10-29-64

ZMHOS-3

OCT 23 1964

MEMORANDUM FOR CHAIRMAN [illegible]
COMMISSIONER [illegible]
COMMISSIONER [illegible]
COMMISSIONER [illegible]
COMMISSIONER [illegible]

SUBJECT: MAGAZINE REPORT TO ACCOMPANY WHOLE BODY COUNTER TEAM TO ALASKA

Attached is a copy of a memorandum of October 20, 1964 from the Director, Division of Public Information, regarding the subject request of the Saturday Evening Post.

I would like to discuss this at an early Information Meeting.

Signed:
John V. Vinciguerra

for General Manager

Attachment:
As stated above

c.c.: GM (2)
AGM
SAGM
AGMA
DPI
GENERAL COUNSEL
SECRETARIAT (2)

10-23-64

Info Mtg 10/26

OFFICE ▶	[illegible]	AGM	GM			
SURNAME ▶	V[illegible]guerra:dnk					
DATE ▶	[illegible]23/64					

AEC-318 (Rev. 9-53) O. S. GOVERNMENT PRINTING OFFICE : 16—82761-3

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : R. E. Hollingsworth, General Manager
Through Howard C. Brown, AGMA

DATE: OCT 20 1964

FROM : Duncan Clark, Director
Division of Public Information

SUBJECT: MAGAZINE REQUEST TO ACCOMPANY WHOLE BODY COUNTER TEAM TO ALASKA

DPI:FT

Steven M. Spencer, Saturday Evening Post science editor, has requested AEC's assistance and cooperation in the Post's sending a writer and photographer with the next team leaving Hanford to measure cesium body burdens in the Eskimo population of Anaktuvuk Pass, Alaska.

We understand that the next Hanford trip is planned for mid-November. This will be the last trip before middle or late spring of 1965.

DPI has checked with the Division of Biology and Medicine and with the Richland Operations Office. They have no objection to the Post's proposal. Our previous experience with Spencer has been good. On balance, we feel that allowing the writer and photographer to accompany the team would result in a more accurate story than one which was prepared without our cooperation. If you approve, the public information officer at Richland will go ahead with the necessary arrangements.

cc: M. R. Cydell, RLO
J. J. Davis, DB&M

APPROVED:

General Manager _____ Date _____

CROSS-REFERENCE *(Name, number, or subject under which this form is filed)*		MH&S 3
IDENTIFICATION OF RECORD	DATE	
	TO	
	FROM	
	BRIEF SUMMARY OF CONTENTS	Telegram to Chairman Seaborg from India re an arrangement with AEC to exchange full information on a daily or regular basis re fallout & other measurements on present and future Chinese Tests.
FILED *(Name, number, or subject under which the document itself is filed)*		MR&A 7 Communish China date of teletype: 10-23-64

10-23-64

MH.S 3

CANCER RESEARCH INSTITUTE
NEW ENGLAND DEACONESS HOSPITAL
194 PILGRIM ROAD
BOSTON, MASSACHUSETTS 02215

October 22, 1964

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

Dear Glenn:

I deeply appreciate the fine help that you and the Division of Biology and Medicine are giving to the new National Council on Radiation Protection and Measurements. I trust that this organization will continue to do even better under its Federal Charter than it has done in the past.

I am sorry to be delayed in answering your letter, but this was because of illness in the family.

With deep appreciation of your interest and help, I am

Sincerely yours,

Shields

SW:NF

MH.S.3

OCT 20 1964

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER HUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

THROUGH GENERAL MANAGER for

SUBJECT: ABSTRACT OF REPORT ON ENVIRONMENTAL EXPOSURE OF NATIVES OF NIUE ISLAND, NEW ZEALAND

I am transmitting the attached excerpt because of your continuing interest in studies of the possible effects of high background levels of radiation on indigenous populations. It appears that although inland background radiation levels on Niue Island are generally higher than normal levels, the uninhabited aspect of these areas offers little hope of systematic studies of chronic low level radiation effects in the populations in the coastal villages.

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

Attachment:
Excerpt from 1963 Ann. Rept.,
Nat'l. Radiation Lab., Dept. of
Health, Government of New Zealand,
No. NRL-AR/14

cc: Secretary (2)
GM
AGMRD
BMA

BMA	ADA
RCBrothers	HAStanwood
10/ /64	10/ /64

BMA / ADMHR	DIRECTOR	AGMRD	DGM	AGM	GM
Welchold/Bruner:dmm	CLDunham				
10/ /64 10/ /64	10/ /64	10/ /64	10/ /64	10/ /64	10/ /64

10-22-64

The following was extracted from the 1963 Annual Report of the National Radiation Laboratory, Department of Health, Government of New Zealand, Report No. NRL-AR/14:

POPULATION EXPOSURE TO GAMMA RADIATION OF NIUE ISLAND

In February 1963, Dr. A. C. Stevenson of the Population Genetics Research Unit, Oxford, requested assistance in a radiation investigation which he was making on Niue Island for the British Medical Research Council. It was known that some soils on the Island showed high radioactivity and the investigation was to decide whether the average genetic exposure of the population was sufficiently high to justify sending a group of specialists there to look for genetic effects which could be attributable to radiation. It had been estimated that, because of the small population, an average genetic exposure of about ten times the accepted normal value would be required to give a reasonable chance of demonstrating any radiation effect.

Mr. H. Yeabsley accompanied Dr. Stevenson to Niue where a survey of the population exposure was undertaken. It became immediately apparent that, because of the predominantly coral nature of the terrain, the coastal area where all the villages are located has an unusually low level of natural background radiation. On the other hand, the uninhabited bush-clad central region was found to have a generally higher radiation level, with scattered patches showing levels a few times the normal value. The most radioactive area known, consisting of a few hundred square yards, indicated a genetic dose of about ten times the normal value. Under the conditions of Niue, the average genetic dose depends mainly on the mean occupancy factor of the more radioactive region. Local information gave a maximum for this factor of one tenth. This determined that the mean genetic population exposure on the Island was considerably less than twice the accepted world average. More detailed evaluation of the dose-rates measured during the visit and of the results (which were available from the Island records) of a previous survey, both indicate that the external radiation from the pockets of radioactive soil only fractionally increases the average genetic exposure on Niue.

The investigation led to the cancellation of the proposed expedition by the British Medical Research Council.

M/605.3

Comm + Enc/1
L L

FEDERAL RADIATION COUNCIL
WASHINGTON 25, D.C.

October 15, 1964

MEMORANDUM FOR: Federal Radiation Council Members

SUBJECT: FRC Report No. 6

Attached for your information are copies of FRC Report No. 6, "Revised Fallout Estimates for 1964-1965 and Verification of the 1963 Predictions."

The President is scheduled to discuss the subject of the report in a talk to be given on a nationwide television program at 9 p.m. on October 15. The White House will give the press release to the press in New York on October 15. We have been asked to hold the report until the press release has, in fact, been issued to the press in the event there is a last minute change in plan.

Paul C. Tompkins

Paul C. Tompkins
Executive Director

Attachment

10-15-64

AEC

IMMEDIATE RELEASE October 15, 1964

Office of the White House Press Secretary

- -

THE WHITE HOUSE

The White House today released Federal Radiation Council Report No. 6, updating information relating to fallout in the environment which was last reported in FRC Report No. 4 of May 1963.

The findings presented in today's report confirm earlier predictions of fallout levels and conclude that health risks from radioactivity in food over the next several years will be too small to justify protective actions to limit the intake of radionuclides through the diet.

Also, the report indicates the following changes in the fallout situation since 1963:

1. Short-lived radionuclides produced by nuclear testing, iodine 131 and strontium-89, have disappeared from the environment.

2. The inventory of the long-lived nuclides strontium-90 and cesium-137 in the atomosphere by mid-1964 was reduced to one-half that in January 1963, at the end of the last test series.

3. Long-lived nuclides have reached a delayed peak in the diet during 1964 and will decrease in future years.

The Federal Radiation Council was established by Executive Order 10831, August 14, 1959, and made statutory by PL 86-373 on September 23, 1959. The purpose of the Council is to 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 report was transmitted to the President by Anthony A. Celebrezze, Secretary of the Department of Health, Education and Welfare and Chairman of the Federal Radiation Council, whose other members are the Secretaries of Agriculture, Commerce, Defense, and Labor, and the Chairman of the Atomic Energy Commission.

# # # # # # # # # # # # # # # # #

[redacted] M.H.S-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

October 2, 1964

MEMORANDUM FOR COMMISSIONER TAPE

THROUGH DIRECTOR OF REGULATION

SUBJECT: FEDERAL RADIATION COUNCIL REPORT NO. 6

Attached is a review of Federal Radiation Council Report No. 6, "Revised Fallout Estimates for 1964-1965 and Verification of the 1963 Predictions," which Dr. Woodruff and I discussed with you Monday afternoon, September 28.

The report is expected to be received from the printer about October 6, but is to be closely held so that release can be timed to coincide with Presidential plans for observance of the Anniversary of the Test Ban on October 9 or 10. These plans are considered administratively confidential. We expect distribution of these reports by participating agencies to be authorized for either October 9 or, in view of the week-end, October 12.

Forrest Western

Forrest Western, Director
Division of Safety Standards

Attachment:
As stated

cc: Chairman Seaborg
Commissioner Bunting
Commissioner Palfrey
Commissioner Ramey

W. B. McCool, Secretary (2)

10-2-64

[redacted]

October 2, 1964

REVIEW OF FEDERAL RADIATION COUNCIL REPORT NO. 6

"REVISED FALLOUT ESTIMATES FOR 1964-1965 AND VERIFICATION OF THE 1963 PREDICTIONS"

Report No. 6 is the third in a series of Federal Radiation Council reports devoted to estimates and evaluation of fallout from nuclear weapons tests. A principal objective of FRC Report No. 3, "Health Implications of Fallout from Nuclear Weapons Testing through 1961," (May 1962), was to provide a better public understanding of the health implications of fallout from the tests then in progress.

Report No. 4, "Estimates and Evaluation of Fallout in the United States from Nuclear Weapons Testing Conducted through 1962," revised and updated estimates of expected levels of fallout and exposures to radiation and discussed the suitability of food products for human use in view of predicted levels of fallout. The current report states, "The report [No. 4] forecast a substantial increase in the probable levels of . . . fallout during 1963 with decreasing quantities in subsequent years. On the basis of radiation doses associated with these levels, it was concluded that the health risk from radioactivity in foods anticipated over the next several years would be too small to justify protective actions to limit the intake of these radionuclides by altering the normal production, processing, and distribution of food, particularly milk and dairy products."

Attachment

The current report, No. 6, is almost entirely devoted to review and revision of the estimates of fallout levels of strontium-90 and cesium-137 presented in the previous report. The short lived nuclides such as iodine-131 and strontium-89 have, of course, essentially disappeared. In the preparation of both Reports No. 4 and No. 6, the Staff of the Council relied heavily on a large panel of consultants well known for their work in various aspects of fallout. Predictions in both reports are said to contain the possibility of error of a factor of two. Discrepancies between levels predicted for 1963 and those observed are discussed in considerable detail. It is now believed that peak levels, previously predicted to occur in 1963, will have occurred in 1964. As a result, fallout levels in 1964 and 1965 are expected to be about 50% higher than predicted in Report No. 4. While this shift increases estimates of radiation doses received in 1964 and 1965, and decreases estimates of doses received in 1963, it does not alter significantly estimates of total doses to the population over periods considered significant from the point of view of genetic and somatic effects (i.e., estimates for periods of 30 and 70 years, respectively).

It appears that Report No. 4 also underestimated the lag in population exposures due to the fact that some foods - especially cereals - experience a long delay between harvest and consumption. Other discrepancies apparently involve unexplained geographical and meteorological factors.

Appended to this memorandum are copies of Figures 1 and 4 and Tables III, IV, VI and VII from the report, which present some observed and predicted levels.

The report observes that the prediction procedures used therein are not applicable to situations markedly different from those prevailing in the United States; particularly the lichen-caribou-man food chain in certain arctic areas. Measurements of quantities of cesium-137 in residents of such areas, using semi-portable whole-body counters, indicate whole-body radiation doses ranging up to about 400 millirads per year. Depending principally upon the retention of cesium-137 in the lichens eaten by the caribou, this could correspond to 30 year doses ranging up to several rads.

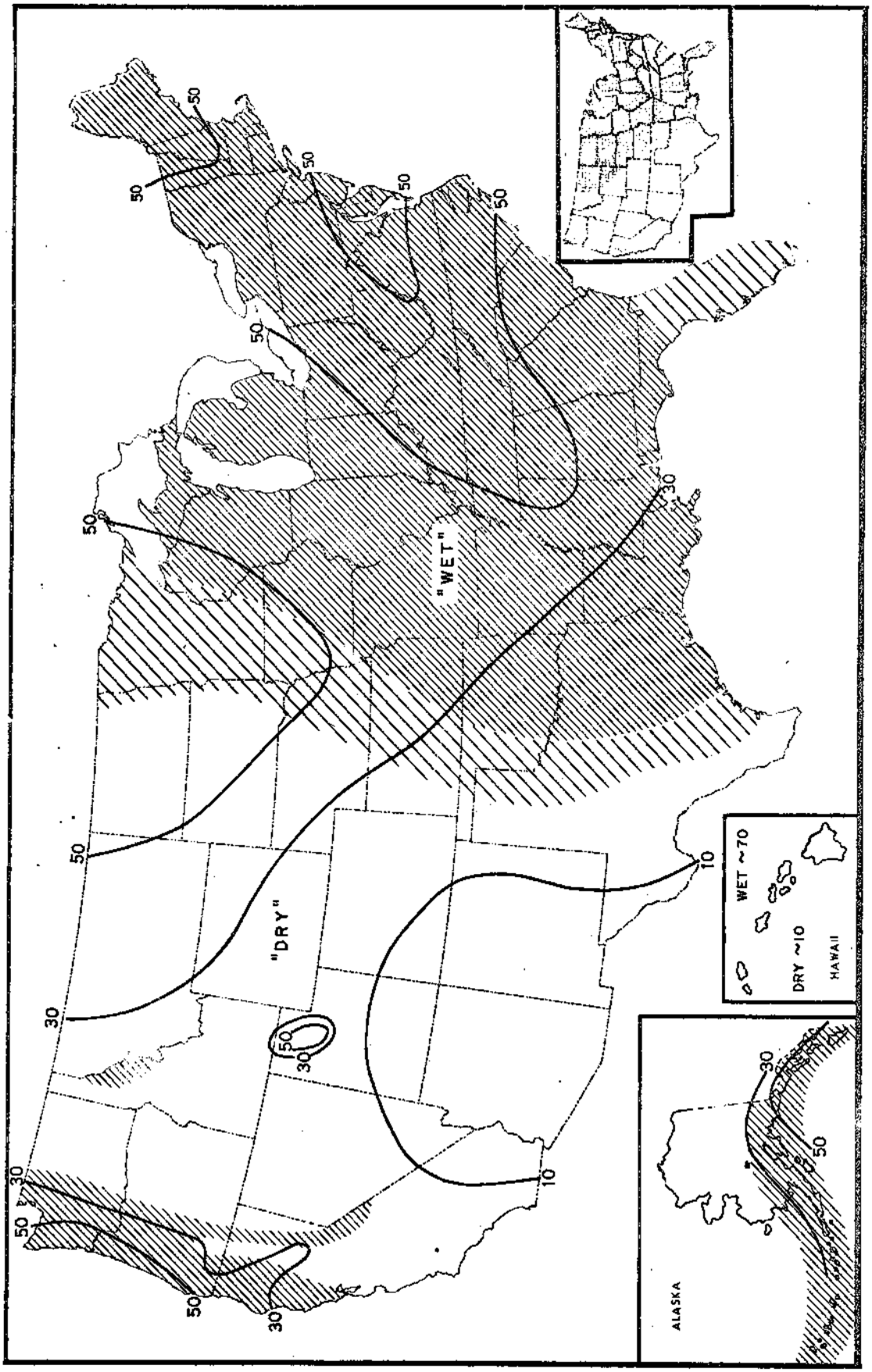
With respect to the biological implications of the predicted levels of fallout, the report reiterates the conclusion that the health risks associated with expected concentrations of fallout in food are too small to justify countermeasures to limit human intake.

DRAFT: 8/20/64
Not for Release
For Discussion Only

FIGURES

1. Strontium-90 deposition over the United States during 1963, in millicuries per square mile. The heavy shaded area denotes the "wet" U.S., the unshaded area, "dry" U.S., intermediate fallout regions possess lighter shading. The shaded area on the small inset map depicts the modified "wet" (or heavier fallout) areas, the unshaded area "dry" (or lighter fallout) area in the contiguous U.S. used in the predictions of this report.

FIGURE 1



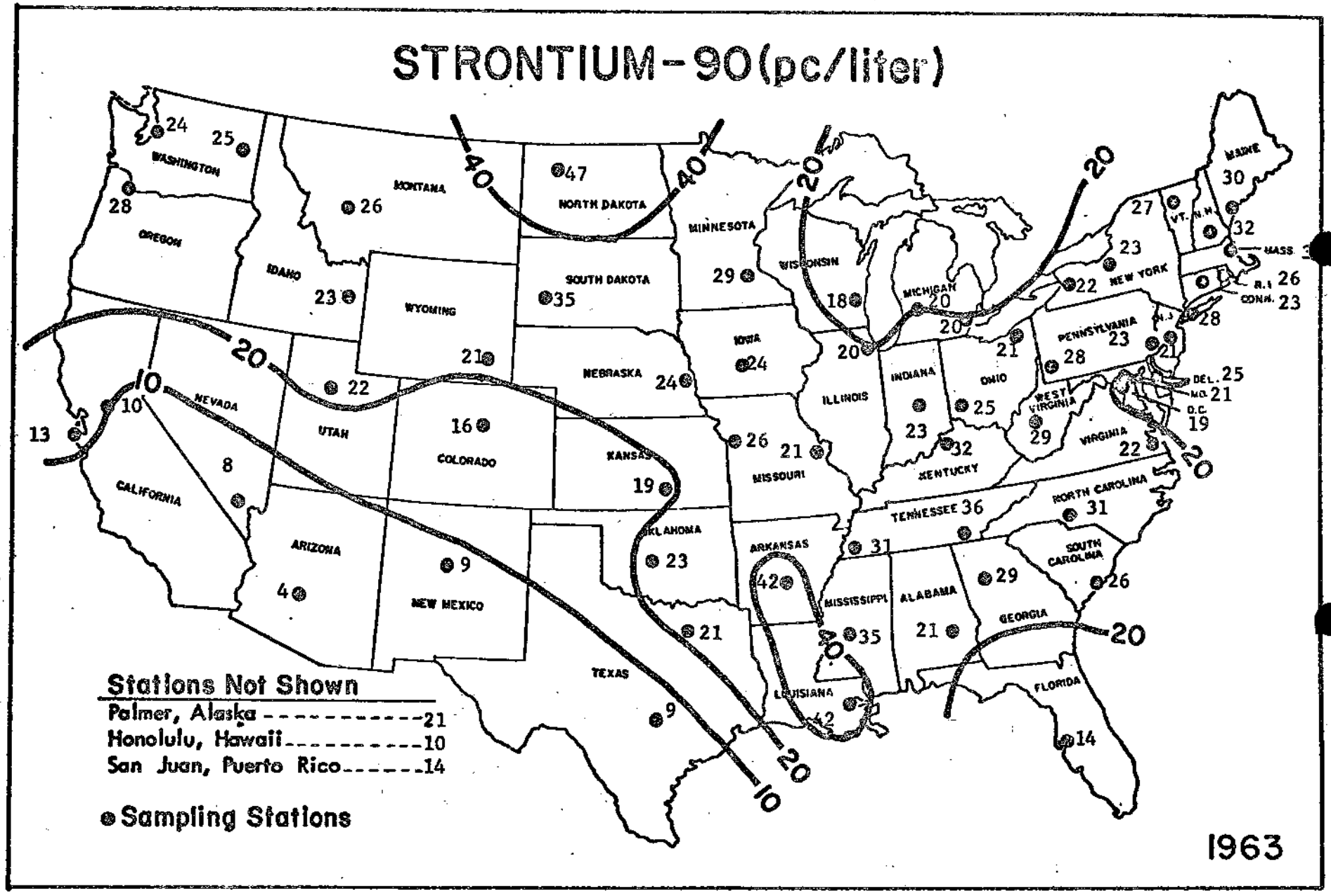


FIGURE 4

FIGURE 4.-- STRONTIUM-90 CONCENTRATIONS IN PASTEURIZED MILK

DRAFT: 8/20/64
Not for Release
For Discussion Only

TABLE III

Comparison of Predicted and Observed Levels of Radionuclides Deposited and in the U.S. Diet in 1963*

	"Wet" Predicted	"Wet" Obs	"Dry" Predicted	"Dry" Obs
Deposition (mc Sr^{90}/mi^2				
Range	30-60		10-30	
Most Probable Value	50	45	20	25
Milk				
Sr^{90} (pc/liter)	30	25	10	15
Sr^{89} (pc/liter)	55	50	40	40
Cs^{137} (pc/liter)	140	125	--	85
Wheat (pc Sr^{90}/kg wheat)	250	220		
Total Diet (pc Sr^{90}/gm Ca)	50	30	35	10
Flour (pc Sr^{90}/gm Ca)	40	40		
New Bone (pc Sr^{90}/gm Ca)	12	7	9	2
Age 0-4 Bone (pc Sr^{90}/gm Ca)	5**	5	3**	2

*Except for bone, both predicted and observed values have been rounded to the nearest 5 units for purposes of comparison since this is considered to be more in keeping with the reliability of the estimates.

** Calculated from the observed strontium-90/calcium ratio in the diet.

DRAFT: 8/20/64
Not for Release
For Discussion Only

TABLE IV

Average Strontium-90 Content of Milk in the U.S.*

(picocuries strontium-90 per liter of milk)

	New York	"Wet" Areas	San Francisco	"Dry" Areas
	Observed			
1959	10	15	--	10
1960	10	10	5	5
1961	10	10	5	5
1962	15	15	5	10
1963	30	25	10	15
	Predicted			
1964	30	--	10	--
1965	25	--	5	--

*Predicted and observed values have been rounded to the nearest 5 units for purposes of comparison since this is considered more in keeping with the reliability of the estimates.

DRAFT: 8/20/64
Not for Release
For Discussion Only

TABLE VI

Average Strontium-90 Content of U.S. Total Diet*

(picocuries strontium-90 per gram calcium)

	Observed	
	N.Y.C. ("Wet" Area)	S.F. ("Dry" Area)
1959	15	10
1960	10	5
1961	5	5
1962	10	5
1963	30	10
	Predicted	
1964	40	20
1965	30	15

* Predicted and observed values have been rounded to the nearest 5 units for purposes of comparison since this is considered more in keeping with the reliability of the estimates.

DRAFT: 8/20/64
Not for Release
For Discussion Only

TABLE VII

Average Strontium-90 Content of Human Bone in the U.S.

(picocuries strontium-90 per gram calcium)

	Bone	
	Observed (0-4 years old)	
	"Wet" Areas	"Dry" Areas
1958	2.0	2.0
1959	2.7	2.2
1960	2.4	1.8
1961	2.6	0.9
1962	3.1	1.1
1963	5.0	1.9
	Predicted (new bone 0-4 yr old)	
1964	10	5
1965	8	4

Note: Concentrations predicted for 1964 and 1965 differ from those observed in earlier years in that the predicted levels refer to new bone as laid down, whereas the observed levels represent average concentrations in the entire skeleton. Thus, if the "predictions" are accurate, corresponding observed average levels will be lower.

MH.S-3

October 2, 1964

MEMORANDUM FOR CHAIRMAN SEABORG

THROUGH GENERAL MANAGER

OCT 5 1964

SUBJECT: THYROID DISEASE IN MARSHALLESE ISLANDERS

During the February 1964 annual medical survey of the Marshallese Islanders exposed to fallout from the March 1, 1954, shot over Bikini, three young teenagers, 13-14 years old, were found to have nodules in their thyroid glands. The medical team felt that two of them should have immediate thyroidectomies, and these operations were successfully carried out at the Naval Hospital on Guam with the full cooperation of the Trust Territory people and the medical services of the Department of Defense.

The pathological diagnoses were papillary adenocarcinoma, a malignant tumor of the thyroid. The prognosis, of course, is uncertain, but the surgeons are reported to have felt that they may have removed all the neoplastic tissue. While this information has not been transmitted formally, it is regarded as reliable. It is planned that a ten year summary of the health status of the exposed Marshallese, including these recent developments, will be prepared for prompt publication in a prominent journal such as the Journal of the American Medical Association.

Preparations are now going ahead to have the third child with a small nodule operated on as soon as possible. The estimated doses to these thyroids are some 150 to 175 rads external gamma plus 100 to 150 rads from absorbed radioiodine.

Since the spontaneous occurrence of two, and possibly three, cases of thyroid neoplasm among the small number of exposed Marshallese children is most unlikely, these observations will probably give rise to comment in various quarters. For this reason, it seems desirable to consider this matter as tentative until the documented data are in hand. You and the Commission will be informed promptly at that time.

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

cc: Commissioner Hunting
Commissioner Palfrey
Commissioner Ramey
Commissioner Tape

cc: Office of Secy (2)
GM (2)
AGMRD
BMA
ADMSR

BMA ADA

10/ /64 10/ /64

ADMSR DIRECTOR

MHBrunnerjpeg CLDunham

10/2/64 10/ /64

MHS 3

Enclosure 3

September 24, 1964

MEMORANDUM FOR CHAIRMAN SEABORG

THROUGH: GENERAL MANAGER

SUBJECT: CURRENT STATUS AND FUTURE OF JOINT NIH-AEC PROGRAMS AT ORNL

Since the inception of the Atomic Energy Commission it has been a primary responsibility of the Division of Biology and Medicine (DBM) to define in precise terms the biological effects of radiation. The development of data to define these effects has involved extensive experimental research utilizing animals, plants, and microorganisms, supplemented by applicable data on man as made available through nuclear accidents or from exploitation of existing natural situations. It has become obvious from studies using high, yet sublethal, doses of radiation that one of the important end points is the development of many types of neoplasms, including leukemia.

In order for these studies to be meaningful, it is essential that experiments using a sufficiently large number of animals to obtain a statistically and biologically valid experiment be conducted under rigidly controlled environmental conditions. Among the important variables are the temperature, the bacterial flora, the diets, and all known disease states. As more study has been given to the development of protocols for these experiments, it has become quite clear that it is essential to control the viruses and the various kinds of carcinogenic chemicals to which the experimental animals may be exposed. Some evidence exists suggesting that radiation may actually mediate some of its carcinogenic effects through the activation of a latent or of a pro-virus in the tissue. The activated virus then might be the direct cause of the neoplasm. Scientists in the Oak Ridge National Laboratory (ORNL), where the largest experiment is currently underway, therefore approached scientists of the National Institutes of Allergy and Infectious Diseases (NIAID) and of the National Cancer Institute (NCI) in further consideration of problems on chemical and viral carcinogenesis. Out of these discussions has grown the cooperative program.

The overlapping interests and responsibilities of the DBM and of the NCI in radiation, chemical and viral carcinogenesis led Directors of the two programs concerned to recognize that a joint endeavor between the two Agencies could have far-reaching favorable effects on the progress ...

of both Agencies' programs. Consequently, early in 1962, members of the staff of DBM and of the staff of the NCI held a series of discussions in Washington to explore the desirability and the feasibility of setting up a joint laboratory program for the study of co-carcinogenesis, i.e., the interaction of ionizing radiation, viruses and chemicals in inducing the development of neoplasms. Subsequent meetings by the staff of DBM and the NCI were held at ORNL with the Management of ORNL and Union Carbide and members of their staffs as well as with the Manager and staff of Oak Ridge Operations Office. There resulted an unanimity of opinion that establishment of the joint venture was highly warranted and should be inaugurated promptly.

During the course of the discussions between DBM and NCI four major points were agreed upon: (a) a joint program would be carried out in facilities available to ORNL; (b) funding for building decontamination and renovation and equipment would be by NCI with AEC funding remodeling costs; (c) NCI would provide operating funds for those portions of the joint program of major interest to the NCI, AEC providing funds for those portions of major interest to AEC; and (d) DBM through the Commission's contractor, Union Carbide, would be responsible for management and development of the joint program with the advice and counsel of NCI.

Bldg. 9211 was made available and the fourth floor (10,500 sq. ft. of utilizable floor space) has been renovated and equipped. Dr. David Dougherty of ORNL has been assigned to head up the aerosol inhalation studies to be carried out there. The other three floors are in the process of being remodeled (approx. 38,500 sq. ft.). The NCI has agreed to make funds available to equip this area. Dr. Stanley Rogers, recently Director of the University of Tennessee Medical Research Institute at Knoxville, has agreed to head up the more basic experimental work on viruses in carcinogenesis which will be carried out in these lower three floors of 9211.

Funding of these efforts has been quite substantial as reflected by AEC expenditures of $6,400,000 and NCI of $4,700,000 planned through FY 1963 from inception in FY 1963, covering both construction and operation.* Accumulated expenditure predicted through FY 1968 (5 years of operation), including the centrifuge technology program, will total about $36,300,000, of which AEC portion is $19,200,000 and NIH $17,100,000. Details of these estimates are shown on the Table attached.

Meanwhile, Dr. Hollaender is pressing hard to expand the NCI funded activity and is offering a large warehouse-type building 9720-6 with 100,000 sq. ft. of floor space for remodeling so that the effort can rapidly be tripled. It is questionable whether NCI can use its "free"

*Note that AEC funding estimates represent that portion of normal operating program support calculated to be contributory to the joint program.

funds to remodel at ORNL. AEC has not available enough General Plant Project funds at ORNL to do this. Hence, to go ahead would require a line item in someone's budget. Dr. Hollaender has written the Director, NCI, that this building could be set up for "cooperative work in virology, pharmacology and developmental biology."

Separately and because of very special needs of the NCI and other institutes for separation of viruses on a large scale, the NCI is funding development work on the zonal centrifuge to the amount of about $950,000 a year. This effort is quite apart from the co-carcinogenesis program.

****

As to the future, it is my opinion that the co-carcinogenesis work under Dr. Rogers should continue for many years at an operating cost rate of $2-3,000,000 annually from NCI.

I believe further that if the NIH wishes it the ORNL could mount a first rate virology effort at about $2 M a year funded either by NIH or jointly with AEC. AEC has a very direct interest in such studies as the relationship between radiation and virus in the etiology of radiation-induced cancer, which is still very obscure.

There has also been talk of a laboratory of developmental biology stressing the effects of radiation, and chemicals on development. This also could be a $2-3,000,000 a year effort, perhaps funded jointly by the two Agencies.

Finally, a major national effort in biotechnology could be a logical development, beginning with the zonal centrifuge program, and calling on many ORNL physical facilities and talents. This one could realistically eventually involve $3-5,000,000 in annual costs mostly with NIH funds.

Any or all of the above four programs would be carried out, but certainly not all to begin at once. Furthermore, it is for the NIH to determine its interest in these programs. They must also recognize that even if Dr. Hollaender were 10 years younger, the Biology Division, ORNL, could no longer be the reflection of the personality of one man. It would be just too big for the personal touch which Dr. Hollaender has been able to impart to it to date.

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

cc: GM (2)
Secretariat (2)
AGM
AGMRD Enclosure
Budget Table

COSTS OF AEC AND NCI IN JOINTLY SUPPORTED PROGRAMS
(In Thousands)

CO-CARCINOGENESIS

	ACTUAL						ESTIMATED						TOTAL	
	FY 63		FY 64		FY 65		FY 66		FY 67		FY 68			
	AEC	NCI	AEC	NCI	AEC	NCI	AEC	NCI	AEC	NCI	AEC	NCI	AEC	NCI
Renovation	- 0 -	534	- 0 -	- 0 -	-0-	-0-	-0-	-0-	-0-	-0-				534
Construction* For AEC	- 0 -	-0-	125	-0-	-0-	-0-	994	-0-	1000	-0-	-0-	-0-	2119	
For NCI	426	-0-	110	-0-	2070	-0-	886	-0-	1000	-0-	-0-	-0-	4492	
Equipment	38	332	65	1348	80	813	100	168	110	200	120	200	525	3053
Operating Costs*	940	124	1193	342	1338	1000	1809	1580	2061	2100	2200	2700	9541	8046
TOTAL	1416	990	1493	1890	3488	1813	3789	1740	4171	2300	2320	2900	16677	11633

CENTRIFUGE TECHNOLOGY

Construction	50	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	50	-0-
Operating Costs **	327	350	400	876	420	850	435	1000	450	1000	475	1000	2507	5076
TOTAL	377	350	400	876***	420	850***	435	1000	450	1000	475	1000	2557	5076

*The operating costs listed above for AEC programs reflect normal program expansions in areas of major AEC interest. Construction costs shown "For AEC" are those partial costs of facilities in which AEC supported portions of the joint program will be conducted. Construction costs "For NCI" are those costs borne by AEC but in which NCI supported activities will be conducted.

**AEC costs in period 1953-62 are estimated at $1,000,000 in addition to costs of centrifuge technology developed in connection with classified work.

*** In addition to the NCI support shown above, the National Institute for Allergy & Infectious Diseases provided support for special work of $250,000 in each of the two years.

September 22, 1964

c/I
5m/A
DL

mR.A-37

NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS

UNTIL OUR NEW OFFICE IS READY
ADDRESS REPLY TO
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25, D. C.

NCRP

SEP 21 1964

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

Dear Dr. Seaborg:

You are, I know, familiar with the work of the National Committee on Radiation Protection and Measurements, and with the fact that this work is now to be carried on by the recently chartered National Council on Radiation Protection and Measurements. The Council is now concerned with developing the means for continuing this important work and, of course, is seeking financial support for this effort.

For the last fourteen years, the Atomic Energy Commission has provided financial support for the NCRP program through a contract with the National Bureau of Standards which operated the secretariat of the National Committee. The funds were used to pay the travel expenses of Committee participants attending NCRP meetings. These funds were of inestimable value in continuing the work of the Committee and directly responsible for our success in completing the many reports which the NCRP has prepared during the period it has enjoyed your support. In return for your valuable support we have, of course, been happy to provide copies of our reports and we trust that their value to your program has justified your continued support.

Now that the NCRP is established as a separate Congressionally chartered organization, the operation of the group will be changed. While we expect to receive the continuing support of the National Bureau of Standards, the Council will now assume the responsibility of operating the secretariat under its own auspices. Therefore, it will not be possible to channel support to the NCRP through the National Bureau of Standards. However, we do hope that you will wish to continue to provide financial support for our efforts and would like to propose that financial assistance of the type you previously provided through NBS now be arranged directly with the Council.

9-21-64

The Executive Committee of the Council has approved a yearly operating budget which can be summarized as follows:

1. Personnel	$25,000
2. Travel	14,000
3. Legal Services	3,000
4. Office Operations	8,750
Total	$50,750

(Note - This does not include publication costs which will be funded separately.)

Funds are to be obtained from foundations, professional and scientific organizations, and Government agencies.

Immediate assistance from the Atomic Energy Commission in the amount of approximately $10,000 for the period from October 1964 through September 1965 would be of great help at this stage in the Council's activities. Support in this amount would represent approximately 40% of the financial assistance which we expect to obtain from Government agencies for our operating budget. We will, of course, continue to supply copies of our reports as evidence of the achievement which your support makes possible.

I would be pleased to discuss this matter further with you at your convenience and would be happy to provide any additional information you might need in considering our request.

Sincerely yours,

Shields Warren

Shields Warren

[redacted]

[redacted]

AEC 604/90

September 10, 1964

COPY NO. 62

AEC 604/90

ATOMIC ENERGY COMMISSION

FEDERAL RADIATION COUNCIL STATUS REPORT

Note by the Assistant Secretary

The Acting Director of Regulation has requested that the attached Federal Radiation Council Information Paper be circulated for the information of the Commission.

F. T. Hobbs

Assistant Secretary

DISTRIBUTION	COPY NO.
Secretary	1,59-66
Commissioners	2-6,67
Dir. of Regulation	7 - 9
General Manager	10 - 11
Deputy Dir. of Regulation	12
Asst. Dir. of Regulation	13
Deputy Gen. Mgr.	14
Asst. Gen. Mgr.	15
Asst. GM-Plans & Prod.	16
Asst. GM Operations	17
Asst. Gen. Mgr. R&D	18
Asst. Gen. Mgr. Adm.	19
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Public Information	27 - 28
Inspection	29
Military Application	30
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Peaceful Nuclear Expl.	33
Plans and Reports	34 - 35
Production	36 - 39
Reactor Development	40 - 48
Manager, Naval Reactors	49
Research	50 - 51
Safety Standards	52 - 53
Albuquerque Operations	54 - 56
Nevada Operations	57 - 58

[redacted]

[redacted]

[redacted] FRC/4/6

DATE: September 4, 1964

FEDERAL RADIATION COUNCIL
Washington, D. C. 20449

INFORMATION PAPER

STATUS REPORT

The attached summary of the current activities of the Federal Radiation Council is submitted for your information.

Paul C. Tompkins
Executive Director

DISTRIBUTION

FRC Members
FRC Working Group
Special Assistant to the President
for Science and Technology
Deputy Director, BOB
L. Westrate - BOB
W. Kolberg - BOB
D. Musser - ACDA
J. Trevithick - State

[redacted]

[redacted]

[redacted] FRC/4/6

STATUS REPORT

1. FRC Report No. 5 --- The President released the Memorandum for the President on Protective Action Guides applicable to iodine-131 on Wednesday, August 19. The release was handled as a routine immediate release with a copy of the background report FRC No. 5 attached. The Memorandum appeared in the Federal Register on August 22.

2. On August 22, Mr. Price, Chairman of the Subcommittee on Research, Development, and Radiation, Joint Committee on Atomic Energy, inserted in the record of the House (Congressional Record-House, pp 19699-19701) a statement relating to the report and the Memorandum for the President. He congratulated the Council on its report on guides applicable to iodine-131. He expressed some disappointment that recommendations for strontium-89, strontium-90, and cesium-137 could not be included at the same time. He also stated that he "shall look forward to the receipt by the first

[redacted]

[redacted]

[redacted]

of next year of approved guides for the long-lived constituents of fission products"; that he "intends to schedule hearings in order that the executive branch can present testimony providing a background for a complete understanding of the guides and the justification for their selection"; and "when the completed job has been received by Congress.....to receive testimony from interested parties in order to form the basis for a judgment concerning the excellence of the guides and their usefulness in practical situations."

3. National Academy of Sciences --- At the request of the FRC the National Academy of Sciences has organized a committee of radiobiologists to assist and advise the Council on matters concerned with the biological effects of atomic radiation. The committee is organizationally under the Medical Sciences Division of the Academy headed by Dr. Keith R. Cannan. Dr. Arthur C. Upton, Oak Ridge National Laboratory, has agreed to serve as the chairman of the committee. The first meeting will be held on September 16.

[redacted]

[redacted]

[redacted]

4. The National Academy of Sciences has been requested to prepare a special background report on the biological effects of exposure to strontium and cesium similar to the special report, "Pathological Effects of Thyroid Irradiation," for iodine. Although a submission date of December 1, 1964, was requested for the Academy's report, this may be considered by the group to be an unreasonable deadline, particularly in view of the date of their first meeting.

5. Status of Protective Action Guides for Strontium-89, Strontium-90, and Cesium-137 --- An outline of the technical questions on which choices must be made before Protective Action Guides for these nuclides can be formulated has been prepared by the Staff with the assistance of the Working Group. The tentative schedule agreed to by the Staff and the Working Group was that the months of August and September would be devoted to organizing some of the technical background material; the months of October and November would be devoted to writing the Memorandum for the President and the corresponding required background report, leaving the months of December and

[redacted]

[redacted]

[redacted]

January for consideration by the Council agencies. There is already a considerable slippage in this plan due, in part, to the delay in getting Report No. 5 released.

6. In addition to the Academy group, the Staff is convening an ad hoc panel of both agency and non-agency personnel to prepare technical background information for use in the development of the guides. The first meeting will be held on September 8.

7. Revised Fallout Estimates for 1964 and 1965 and Verification of the 1963 Predictions --- By Action Paper FRC/1/4, 8/24/64, the Staff submitted the subject report for the approval of the Council representatives. If the report is approved by the Council and the President, it is intended that it will be released as FRC Report No. 6.

8. Annual Report of Federal Agencies to the FRC --- The Federal agencies having radiation protection activities which may fall under the Radiation Protection Guidance promulgated

[redacted]

[redacted]

[redacted]

by the President have submitted their reports. The Staff is preparing a summary report for the information of the Council.

9. Formation of the National Council on Radiation Protection and Measurements --- The formation of the National Council on Radiation Protection and Measurements (NCRP) was announced on August 6, 1964, by Dr. Lauriston Taylor, President of the Council. The Council was created as a non-profit corporation by Public Law 88-376 which was signed by the President on July 14, 1964.

10. The National Council on Radiation Protection and Measurements will take over, and continue, the work previously carried out by the National Committee on Radiation Protection and Measurements. The Federal Radiation Council was instructed to consult with the NCRP by Public Law 86-373.

[redacted]

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

MMES-3

UNITED STATES GOVERNMENT

Memorandum

TO : Heads of Offices and Divisions, Headquarters
Managers of Field Offices

DATE: September 14, 1964

FROM : Gordon M. Dunning, Deputy Director
Division of Operational Safety

SUBJECT: TRANSMITTAL OF MEMORANDUM FOR THE PRESIDENT, "RADIATION PROTECTION GUIDANCE FOR FEDERAL AGENCIES", AND FRC REPORT NO. 5

OS:DIR:GMD

Attached for your information are copies of the Memorandum for the President, subject: "Radiation Protection Guidance for Federal Agencies", and FRC Report No. 5, "Background Material for the Development of Radiation Protection Standards".

Please note that the criteria expressed in these documents are not operating guides. Rather, they are guides to Federal agencies in planning protective actions to reduce potential doses to the population in the event such action is deemed necessary. This FRC Report No. 5 does not change in any way existing radiation protection standards of the Atomic Energy Commission.

Attachments:
1. Memorandum for the President
2. FRC Report No. 5

→ filed in B-2

9-14-64

FEDERAL RADIATION COUNCIL

RADIATION PROTECTION GUIDANCE FOR FEDERAL AGENCIES

Memorandum for the President

JULY 16, 1964.

Pursuant to Executive Order 10831 and Public Law 86–373, the Federal Radiation Council is transmitting recommendations for the approval of the President for guidance of Federal agencies in their radiation protection activities. The present recommendations are directed to guidance for protective actions affecting the normal production, processing, distribution, and use of food products for human consumption. Specific guidance is provided for iodine-131. It is the intention of the Council to release the background material leading to these recommendations as Staff Report No. 5 when the recommendations herein are approved.

Background. The first two memorandums which provided guidance for Federal agencies in the conduct of their radiation protection activities were approved by the President on May 13, 1960, and September 20, 1961. These provided a general philosophy of radiation protection and general principles of control based on the annual intake of radionuclides. The recommendations contained therein provided the basis for the control and regulation of normal peacetime operations in which exposure to radiation is a factor. Numerical values were provided for the Radiation Protection Guides designed to limit the exposures of the whole body and of certain organs resulting from normal peacetime operations.

During the period of atmospheric testing of nuclear weapons in 1961 and 1962 the question arose as to the use of these Radiation Protection Guides for determining the conditions under which the production, processing, distribution, and use of food, particularly fresh fluid milk, should be altered to reduce human intake of radionuclides from fallout.

In September 1962 the Federal Radiation Council stated its position on this subject, and in 1963 the Council reiterated that existing guides were not applicable to a determination of a need for protective actions and noted that it would recommend guidance on the subject to the President.

Concept of Protective Action Guide. In previous reports the Federal Radiation Council has recommended a philosophy of radiation protection and discussed alternative approaches to the derivation of basic guidance for radiation protection. It has pointed out that decisions concerned with radiation protection involve a balance between the possible health risks associated with radiation exposure and the reasons for accepting the exposure. The Council adopted the term "Radiation Protection Guide" to express the balance between the benefits from normal peacetime operations and the health risks associated with those exposures. The radionuclide releases causing these exposures are generally controlled at the source.

Radiation protection guidance for protective actions applicable to ingestion of food contaminated with radioactive material requires a different balance. Here, the Council is concerned with a balance between the risk of radiation exposure and the impact on public well-being associated with alterations of the normal production, processing, distribution, and use of food.

For this purpose, the Council has adopted the term "Protective Action Guide" (PAG), defined as the projected absorbed dose to individuals in the general population which warrants protective action following a contaminating event. The projected dose is the dose that would be received in the future by individuals in the population group from the contaminating event if no protective action were taken. If the projected dose exceeds the PAG, protective action is indicated. According to the operational technique adopted in the Memorandum for the President, May 1960, the corresponding average projected dose to a suitable sample of the exposed population would be one-third of the PAG.

A protective action is an action or measure taken to avoid most of the exposure to radiation that would occur from future ingestion of foods contaminated with radioactive materials. Such actions are appropriate when the health benefits associated with the reduction in exposure to be achieved are sufficient to offset the undesirable features of the protective actions. The PAG represents the Council's judgment as to where this balance should be for the conditions considered most likely to occur. If, in a particular situation, there is available an effective action with low total impact, initiation of such action at a projected dose lower than the PAG may be justifiable. If only very high impact action would be effective, initiation of such action at a projected dose higher than the PAG may be justifiable.

A basic assumption in the development of the guidance in this memorandum is that a condition requiring protective action is unusual and should not be expected to occur frequently. In any event, the numerical values selected for the Protective Action Guides are not intended to authorize deliberate releases expected to result in absorbed doses of these magnitudes.

The types of actions to which application of the Protective Action Guides may be related are:

1. Altering production, processing, or distribution practices affecting the movement of radioactive contamination through the food chain and into the human body. This action includes storage of food supplies and animal feeds to allow for radioactive decay.
2. Diverting affected products to uses other than human consumption.
3. Condemning affected foods.

Measures that require an alteration of the normal diet are generally less desirable than those listed and should not be undertaken except on the advice of competent medical authorities.

Radionuclides considered. Four radionuclides are of particular importance in considering radioactive contamination of food. These are iodine-131, strontium-89, strontium-90, and cesium-137. This memorandum will deal only with iodine-131.

In contrast to the other fission nuclides, the relatively high yield of iodine-131 and the short radioactive half-life (8 days) of iodine-131 make it the radionuclide most likely to reach concentrations justifying protective actions. This is especially true if the deposition occurs within a few days after the fission event. Protective action against iodine-131 must be taken promptly in order to be effective.

Physical and biological factors related to iodine-131 have been considered in FRC Reports No. 1 and No. 2. As in FRC Report No. 2, it is assumed that children one year of age, with a thyroid weight of 2 grams and 30 percent uptake of iodine-131, are the critical segment of the population.

Protective actions against iodine-131. The Council has evaluated the kinds of protective actions available for use against iodine-131, the health benefit

CROSS-REFERENCE *(Name, number, or subject under which this form is filed)*		MH&S 3-
IDENTIFICATION OF RECORD	DATE	
	TO	
	FROM	
	BRIEF SUMMARY OF CONTENTS	LOAN OF AEC AND CONTRACTOR PERSONNEL FOR FRC STUDY. Memo to AEC Chairman from Paul C. Thompkins . In a review of technical information related to the formulation of Protective action guides for strontium-89, strontium-90 and cesium-137.
FILED *(Name, number, or subject under which the document itself is filed)*		0-M 7-FEDERAL RADIATION COUNCIL date 9-2-64

et

9-2-64

Mtls-3-Radiation Effects

AUG 25 1964

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

AUG 26 1964

THROUGH GENERAL MANAGER S/ W. Lovelace for

SUBJECT: THE 1964 PRINTING OF "THE EFFECTS OF NUCLEAR WEAPONS - 1962"

The 1964 printing of "The Effects of Nuclear Weapons - 1962" has been received from the Government Printing Office, and I am pleased to transmit a copy with this memorandum.

As was stated in my memorandum of April 14, 1964, on this subject, advantage has been taken of this printing to make some changes to the text. Five pages of Chapter VII, "Thermal Radiation and Its Effects," have been modified, and reflect a reduced fire hazard from nuclear explosions than was anticipated at the time material was prepared for the 1962 printing. Appendix B, the list of announced nuclear detonations, has been extended through 1963, and the declassified yield of IVY Mike has been added. Elsewhere, a few typographical errors have been corrected.

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

Attachment
1964 printing of "The Effects of Nuclear Weapons - 1962" - filed in D.C. Office

cc: GM
AGMRD
Secretariat (2)
DPI
DTI
BMA

8-25-64

AEC
UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

MMES-3

B-425

No. IN-511
Tel. 973-3335 or
973-3446

FOR IMMEDIATE RELEASE
(Friday, August 21, 1964)

AEC PUBLISHES BOOKLET ON EMERGENCY RADIOLOGICAL PROCEDURES

The Atomic Energy Commission has published a booklet which tells what to do if radioactive materials are involved in accidents during shipment. The booklet, in its introductory paragraphs, seeks to place radiological hazards in perspective with other hazards.

The illustrated booklet, entitled "Radiological Emergency Procedures for the Non-Specialist," was prepared for the Interagency Committee on Radiological Assistance. This group is composed of representatives from the following Federal agencies: Treasury Department, Department of Defense, Post Office Department, Department of Commerce, Department of Agriculture, Department of Labor, Department of Health, Education, and Welfare, Atomic Energy Commission, Federal Aviation Agency, Interstate Commerce Commission, National Aeronautics and Space Administration, and the Office of Civil Defense.

Copies of the booklet may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402, for 35 cents a copy.

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8/21/64

8-21-64

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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

AUG 20 1964

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: FEDERAL RADIATION COUNCIL REPORT NO. 5

The President signed Federal Radiation Council Report No. 5 on July 31. The report recommends, among related matters, that the "Protective Action Guide" for Iodine-131 be 30 rads to the thyroid.

The FRC report was distributed on August 19, to newsmen by the President's Press Secretary, George Reedy. We understand that you earlier received a copy of the report from the FRC. We expect to receive bulk quantities of the report shortly.

Signed
Duncan Clark

Duncan Clark, Director
Division of Public Information

cc: R. E. Hollingsworth, General Manager
C. L. Dunham, Dir., DM
N. B. Woodruff, Dir., OS
W. B. McCool, SECY

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August 18, 1964

AEC 604/89

COPY NO. 62

AEC 604/89

ATOMIC ENERGY COMMISSION

NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS

Note by the Acting Secretary

The Director of Regulation has requested that the attached memorandum to NCRP Participants and the news release on the formation of the Council be circulated for the information of the Commission.

F. T. Hobbs
Acting Secretary

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NATIONAL COMMITTEE ON RADIATION PROTECTION
AND MEASUREMENTS

NCRP/64/17

July 17, 1964

TO: NCRP Participants

FROM: Lauriston S. Taylor, Chairman Lauriston S Taylor

SUBJECT: Birth of the National Council on Radiation Protection and Measurements

I am indeed pleased to be able to report that the Bill to incorporate the NCRP was passed by the Senate on July 2, 1964, and was signed into law by the President on July 14, 1964. Thus, the long effort of the NCRP to achieve an independent status has reached fruition.

Plans are now being made to complete the organizational steps necessary to bring the National Council on Radiation Protection and Measurements into being. Drastic changes in the mode of operation of the NCRP are not contemplated, but I think this occasion marks a milestone in the work of our organization.

We will of course keep all participants informed of our progress toward completion of the organization of the Council, and we look forward to your continued interest and support.

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NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS

For additional information:

W. R. Ney
National Bureau of Standards
Washington, D. C.

August 6, 1964

FOR IMMEDIATE RELEASE

FORMATION OF THE NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASURMENTS

The formation of the National Council on Radiation Protection and Measurements (NCRP) was announced today in Washington, by Dr. Lauriston S. Taylor, President of the Council. The Council, a non-profit corporation, was created by an Act of Congress (Public Law 88-376), which was signed by the President on July 14, 1964. The Council was brought into being at its organizational meeting held in Washington on August 3, 1964.

One of the principal objects of the Council will be to collect, analyze, develop and disseminate scientific information and recommendations about protection against radiation and about radiation measurement.

In this connection the Council will take over and continue the work previously carried out by the National Committee on Radiation Protection and Measurements, an association of scientists, which has for the last thirty-five years provided the basic material on which radiation protection activities in the United States are founded. The National Committee, established in 1929, has promulgated thirty-one handbooks on radiation protection and measurements published by the National Bureau of Standards. The increasing importance of radiation protection efforts in the United States led the members of the Committee to seek formal status via a federal charter.

The significance of the work of these scientists and the need for the establishment of a formal organization received recognition when Senator John O. Pastore, Chairman of the Joint Committee on Atomic Energy, and Representative Chet Holifield, Vice-Chairman of the Joint Committee introduced in the Senate and House of Representatives identical bills to charter the National Council. Testifying in support of the bills before Subcommittee 4 of the House Judiciary Committee in 1963, Congressman Holifield said:

> "As past Chairman and currently Vice-Chairman of the Joint Committee on Atomic Energy, and as one who has been a member of the Committee from its inception extending over 16 years, I have had many opportunities to evaluate the work of the NCRP. My belief in the soundness of the organization is the result of numerous studies, investigations and hearings conducted by the Joint Committee over the years, covering such matters as fallout from nuclear weapons testing; radioactive waste disposal; employee hazards and workmen's compensation; Federal-State relations in the control of Atomic Energy; and the development and application of radiation protection standards. In general, I think it can be said that the agencies of government rely heavily on the informed data and opinions of the NCRP."

Representative Hollfield's support was important in obtaining final passage of the bills that created the new Council.

At its organization meeting, the Council determined to continue the work begun by the previous Committee and took the initial steps necessary to form a viable organization capable of carrying out the purposes set forth in its charter.

Dr. Lauriston S. Taylor a leader in radiation protection activities for three decades, was elected President of the Council; Dr. Shields Warren, an international authority in radiation pathology, was elected Vice-President. The Council also elected a 53-man Board of Directors, (see attached list) an Executive Committee and a Finance Committee. The Council plans to open an office in Washington in the near future and expects to hire a full-time Executive Director at the time.

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AEC 604/88

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August 12, 1964

COPY NO. 64

ATOMIC ENERGY COMMISSION

RADIATION PROTECTION GUIDANCE AND STATUS REPORT

Note by the Acting Secretary

1. The Director of Regulation has requested that the attached memorandum to the President from the Chairman, Federal Radiation Council, with enclosures, be circulated for the information of the Commission.

2. The Director of Regulation has advised that:

"It is expected that the Memorandum for the President will be published in the FEDERAL REGISTER at which time copies will be made for distribution with Federal Radiation Council Report No. 5. A copy of Federal Radiation Council Report No. 5 is presently on file in the Division of Safety Standards."

F. T. Hobbs

Acting Secretary

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FEDERAL RADIATION COUNCIL
WASHINGTON, D.C. 20449

16 JUL 1964

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Radiation Protection Guidance and Status Report

The Federal Radiation Council transmits to you: (1) a Memorandum for the President which contains recommendations for protective actions related to contamination of foods by iodine-131, and (2) a status report on the development of additional recommendations for three other fallout radionuclides: strontium-89, strontium-90, and cesium-137.

The Council recommends that you approve the guidance in the Memorandum for the President. With your approval, a copy of the attached Memorandum and status report will be transmitted to the Joint Committee on Atomic Energy for its information on the progress of the Council in developing guidance related to fallout and protective actions.

sgd ---
Anthony J. Celebrezze
Chairman

Attachments 2

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FEDERAL RADIATION COUNCIL
WASHINGTON, D.C. 20449

16 JUI 1964

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Radiation Protection Guidance for Federal Agencies

Pursuant to Executive Order 10831 and Public Law 86-373, the Federal Radiation Council is transmitting recommendations for the approval of the President for guidance of Federal agencies in their radiation protection activities. The present recommendations are directed to guidance for protective actions affecting the normal production, processing, distribution, and use of food products for human consumption. Specific guidance is provided for iodine-131. It is the intention of the Council to release the background material leading to these recommendations as Staff Report No. 5 when the recommendations herein are approved.

Background The first two memorandums which provided guidance for Federal agencies in the conduct of their radiation protection activities were approved by the President on May 13, 1960, and September 20, 1961. These provided a general philosophy of radiation protection and general principles of control based on the annual intake of radionuclides. The recommendations contained therein provided the basis for the control and regulation of normal peacetime operations in which exposure to radiation is a factor. Numerical values were provided for the Radiation Protection Guides designed to limit the exposures of the whole body and of certain organs resulting from normal peacetime operations.

During the period of atmospheric testing of nuclear weapons in 1961 and 1962 the question arose as to the use of these Radiation Protection Guides for determining the conditions under which the production, processing, distribution, and use of food, particularly fresh fluid milk, should be altered to reduce human intake of radionuclides from fallout.

In September 1962 the Federal Radiation Council stated its position on this subject, and in 1963 the Council reiterated that existing guides were not applicable to a determination of a need for protective actions and noted that it would recommend guidance on the subject to the President.

Concept of Protective Action Guide In previous reports the Federal Radiation Council has recommended a philosophy of radiation protection and discussed alternative approaches to the derivation of basic guidance for radiation protection. It has pointed out that decisions concerned with radiation protection involve a balance between the possible health risks associated with radiation exposure and the reasons for accepting the exposure. The Council adopted the term "Radiation Protection Guide" to express the balance between the benefits from normal peacetime operations and the health risks associated with those exposures. The radionuclide releases causing these exposures are generally controlled at the source.

Radiation protection guidance for protective actions applicable to ingestion of food contaminated with radioactive material requires a different balance. Here, the Council is concerned with a balance between the risk of radiation exposure and the impact on public well-being associated with alterations of the normal production, processing, distribution, and use of food.

For this purpose, the Council has adopted the term "Protective Action Guide" (PAG), defined as the projected absorbed dose to individuals in the general population which warrants protective action following a contaminating event. The projected dose is the dose that would be received in the future by individuals in the population group from the contaminating event if no protective action were taken. If the projected dose exceeds the PAG, protective action is indicated. According to the operational technique adopted in the Memorandum for the President, May 1960, the corresponding average projected dose to a suitable sample of the exposed population would be one-third of the PAG.

A protective action is an action or measure taken to avoid most of the exposure to radiation that would occur from future ingestion of foods contaminated with radioactive materials. Such actions are appropriate when the health benefits associated with the reduction in exposure to be achieved are sufficient to offset the undesirable features of the protective actions. The PAG represents the Council's judgment as to where this balance should be for the conditions considered most likely to occur. If, in a particular situation, there is available an effective action with low total impact, initiation of such action at a projected dose lower than the PAG may be justifiable. If only very high impact action would be effective, initiation of such action at a projected dose higher than the PAG may be justifiable.

A basic assumption in the development of the guidance in this memorandum is that a condition requiring protective action is unusual and should not be expected to occur frequently. In any event, the numerical values selected for the Protective Action Guides are not intended to authorize deliberate releases expected to result in absorbed doses of these magnitudes.

The types of actions to which application of the Protective Action Guides may be related are:

1. Altering production, processing, or distribution practices affecting the movement of radioactive contamination through the food chain and into the human body. This action includes storage of food supplies and animal feeds to allow for radioactive decay.

2. Diverting affected products to uses other than human consumption.

3. Condemning affected foods.

Measures that require an alteration of the normal diet are generally less desirable than those listed and should not be undertaken except on the advice of competent medical authorities.

Radionuclides Considered Four radionuclides are of particular importance in considering radioactive contamination of food. These are iodine-131, strontium-89, strontium-90, and cesium-137. This memorandum will deal only with iodine-131.

In contrast to the other fission nuclides, the relatively high yield of iodine-131 and the short radioactive half-life (8 days) of iodine-131 make it the radionuclide most likely to reach concentrations justifying protective actions. This is especially true if the deposition occurs within a few days after the fission event. Protective action against iodine-131 must be taken promptly in order to be effective.

Physical and biological factors related to iodine-131 have been considered in FRC Reports No. 1 and No. 2. As in FRC Report No. 2, it is assumed that children one year of age, with a thyroid weight of 2 grams and 30 percent uptake of iodine-131, are the critical segment of the population.

Protective Actions Against Iodine-131 The Council has evaluated the kinds of protective actions available for use against iodine-131, the health benefit that may result by averting a radiation dose larger than the Protective Action Guide, and the probable impact of taking the actions. Of various actions that might be effective in averting the major part of the potential exposure, two appear to provide the most acceptable combinations of maximum effectiveness and minimum undesirable consequences. One of these is the diversion of fresh milk to provide unaffected milk in the contaminated area and to use the affected milk in the production of dairy products that may be conveniently stored until the iodine-131 has effectively decayed, a matter of a few weeks. The other is the substitution of stored feed for pasturage, until most of the iodine-131 has decayed.

Recommendations In view of the considerations summarized, the following recommendations are made.

It is recommended that:

1. The term "Protective Action Guide" (PAG) be adopted for Federal use.

The Protective Action Guide is defined as the projected absorbed dose to individuals in the general population which warrants protective action following a contaminating event. The projected dose is the dose that would be received in the future by individuals in the population group from the contaminating event if no protective action is taken.

It is recommended that:

2. The Protective Action Guide for iodine-131 be 30 rads to the thyroid.

If the projected dose exceeds the Protective Action Guide, protective action is indicated.

According to the operational technique adopted in the Memorandum for the President, May 1960, the corresponding average projected dose to the thyroids of a suitable sample of the exposed population group would be 10 rads.

It is recommended that:

3. The guidance contained herein be approved for the use of Federal agencies in the conduct of those radiation protection activities affecting the normal production, processing, distribution, and use of food and agricultural products.

sgd ---

Anthony J. Celebrezze
Chairman

The recommendations numbered "1" through "3" contained in the above memorandum are approved for the guidance of Federal agencies, and the memorandum shall be published in the Federal Register.

Date: 31 JUL 1964

sgd ---
Lyndon B. Johnson

FEDERAL RADIATION COUNCIL

STATUS OF RECOMMENDATIONS FOR PROTECTIVE ACTION GUIDES APPLICABLE TO STRONTIUM-89, STRONTIUM-90, AND CESIUM- 137

The Federal Radiation Council has agreed to formulate recommendations indicating the conditions under which the normal production, processing, distribution and use of food products should be altered as the result of radioactive fallout. Studies during the past year have led to the conclusion that such recommendations will most likely be needed for four radionuclides --- iodine-131, strontium-89, strontium-90, and cesium-137.

The Council has reached agreement on:

1. The kinds of situations most likely to lead to a requirement for protective action. (Inadvertent deposition following a major release of fission products.)

2. The criteria on which the guidance should be based. (The projected absorbed dose for a single episode.)

3. The kinds of protective action to which the guidance may be applied. (Actions that change the normal production, processing, distribution and use of food products for human consumption.)

4. The definition of a "Protective Action Guide" by which these criteria can be reduced to numerical values for determining

when protective actions are indicated. (The Protective Action Guide is the projected absorbed dose to individuals in the general population which warrants protective action following a contaminating event.)

5. Numerical Protective Action Guides applicable to contamination of the environment by iodine-131. (Thirty rads to the thyroid of individuals in the population or 10 rads to the average of a suitable sample of the population.)

The Council's recommendations covering these points have been submitted for your approval.

The development of guides applicable to strontium-89 and, especially, to strontium-90 and cesium-137 requires the evaluation of considerations not relevant to iodine-131. These questions arise from the chemical properties of strontium and cesium and from the relatively long half-lives of the radionuclides concerned. Especially difficult are considerations of the time span over which individuals may be exposed to strontium-90 or cesium-137 and of practical ways by which this exposure may be avoided.

The technical staff is evaluating the alternatives using a value of 15 rads for exposure of individuals in the population and 5 rads as the corresponding average of a suitable sample of the population as tentative figures for the Protective Action Guides for these nuclides. The values apply to exposure of the whole body, blood-forming organs and reproductive tissue. We expect our recommendations for these nuclides to be ready in the next three to six months.

July 1964

DGM

C/I

D.S.-459.16

AUG 11 1964

Dear Senator Moss:

This is in response to your letter of July 29, 1964, concerning the U. S. Public Health Service ongoing study for evaluating radiation injury to people in Utah and Nevada, resulting from nuclear detonations at the Nevada Test Site.

As we pointed out in our letter to you of September 17, 1963, there is no evidence that the levels of radioactivity resulting from the Commission's testing activities at the Nevada Test Site have been the cause of thyroid cancer or leukemia in any individual. Indeed, the estimated radiation exposures are very substantially lower than those required to produce these effects. For example, the highest estimate made by any scientist of exposure to the thyroids of children during the relatively heavy fallout in the summer of 1962 was 7 to 14 rads for one small locality (Altonah, Utah). These values of 7 to 14 rads may be placed in perspective by quoting from the report by a Panel of Experts from the Committees on Biological Effects of Atomic Radiation: National Academy of Sciences-National Research Council, Pathological Effects of Thyroid Irradiation, July 1962. In describing therapeutic uses of iodine-131 in the treatment of hyperthyroidism, the report stated:

> ". . . 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 rad upward."

Nevertheless, as an indication of our vital interest in matters of health, we asked the U. S. Public Health Service to include studies on thyroid cancer cases as a part of their planned epidemiological studies in the Utah-Nevada area. The customary approach in such epidemiological studies is through extensive examination of morbidity and mortality statistics. This approach is followed without regard to any possible anticipated results.

While an underground testing program is, under present circumstances, essential to our National security, we assure you that procedures are continuously under review for insuring against release of radioactivity to the atmosphere. For each proposed test,

8-11-64

critical studies are made to insure the health and safety of the population before approval is given to conduct any underground detonation. Investigations in areas such as weather predictions, ground shock evaluations and containment of radioactivity continue, and only after there is assurance that appropriate cognizance has been taken of all known problems and these have been thoroughly considered is approval given for the detonation. Safety procedures at the Nevada Test Site are reviewed in the attachments; Health Aspects of Nuclear Weapons Testing and Releases of Radioactivity from Nuclear Detonations (presented before the Special Subcommittee on Air and Water of the Senate Committee on Public Works on June 30, 1964)

At the time we wrote you last September, the Limited Test Ban Treaty had just been approved. Since it's approval, 28 underground detonations at the Nevada Test Site have been announced. Only two of these detonations inadvertently released small, but detectable, amounts of radioactivity in populated areas off the test site. The highest potential out-of-door external gamma radiation exposures at populated areas was about 15 millirocntgens at Cactus Springs, Nevada. The next highest was about six millirocntgens at Indian Springs, Nevada. These values are minor compared to the 150-200 millirocntgen annual exposures in these areas from natural background radiation. Although low levels of radioiodine were detected in some samples of milk from individual farms, none were found in commercially available milk at any location sampled. As a matter of fact, no iodine-131 has been detected in milk from the U. S. Public Health Service National Pasteurized Milk Network since May 1963.

If we can be of any further assistance, please do not hesitate to let me know.

Sincerely yours,

(Signed) G. E. Tape

Acting Chairman

bcc: General Manager, w/o atts.
R. E. Hollingsworth, DGM, w/o atts.
J. V. Vinciguerra, AAGM, w/o atts.
E. J. Bloch, AGMO, w/o atts.
C. L. Dunham, BM, w/o atts.
J. S. Kelly, PNE, w/o atts.
D. L. Crowson, MA, w/o atts.
J. F. Hennessey, GC, w/o atts.
G. M. Dunning, OS, w/o atts.
Congressional Relations (2)
The Honorable Frank E. Moss
United States Senate

Attachments:
1. Health Aspects of Nuclear Weapons Testing
2. Releases of Radioactivity from Nuclear Detonations

NHS-3

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

AUG 7 1964

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY
COMMISSIONER TAPE

SUBJECT: RUTHENIUM-106 IN RUTHENIUM ORIGINATING FROM FALLOUT

In 1960 the Division of Compliance determined that low concentrations of ruthenium-106 were present in commercial supplies of ruthenium metal. This raised a question as to the potential radiation exposure to the public, inasmuch as approximately 8% of the supply of ruthenium metal was used as an alloy in jewelry and 2% was used as an alloy in dentures. The remainder was used in industrial products such as electrical contacts and as a catalyst.

The concentration of ruthenium-106 ranged from 0.0054 to 0.386 microcuries per gram of the stable element ruthenium, which is 54 to 3,860 times the exempt concentration of .0001 μc/gm permitted under 10 CFR 30.9(a). The U. S. Metals Refining Company was found to be the principal domestic supplier of ruthenium metal in the United States. In May 1960, that company possessed 287 troy ounces of ruthenium in which the average concentration of ruthenium-106 was 0.13 microcuries per gram of ruthenium. The total quantity of ruthenium-106 in the possession of U. S. Metals, about 30 microcuries, was 30 times the generally licensed quantity of 1 microcurie permitted under 10 CFR 30.21(a)(2) as a single quantity.

As measured in June 1960, the maximum radiation levels from the ruthenium alloys used in jewelry and dentures were found to be about 6 mr/hr on contact. The level is reduced by a factor of 1/2 each year by decay of the ruthenium-106. The maximum dose from total decay of ruthenium-106 in the alloys is about 70 rems, assuming the alloy is in continuous contact with tissue.

X-PFC-1-1- Reg By-Product Material

8-7-64

Acting voluntarily, one company withdrew approximately 2,000 artificial teeth from distribution in June 1960, and another company withdrew approximately 10,000 orthodontic bands in August 1960. We have recently been informed by representatives of the dental industry that, to their knowledge, ruthenium is no longer used in the trade and gold is now being used.

On the basis of a determination in June 1960 by the Director, Division of Biology and Medicine, that even the decay dose to the mouth would be inconsequential, it was concluded that the potential radiation dose to the public from the contaminated ruthenium did not present a significant health and safety problem.

Nevertheless, a byproduct material license was issued to U. S. Metals Refining Company in July 1960, authorizing only the separation of ruthenium from other rare metals in the course of its normal production activities and the storage of the ruthenium in its possession.* It was considered by the staff that this ad hoc action was desirable as a temporary measure until the source of the contamination and the nature and extent of any possible radiation safety problems could be further investigated.

Subsequent to the issuance of the license to U. S. Metals Refining Company, it was determined through studies conducted by the Health and Safety Laboratory that the most probable source of the ruthenium-106 is fallout from nuclear weapons testing. From measurements that were made it appears that all ruthenium metal produced since the advent of nuclear weapons testing is contaminated to some extent with ruthenium-106.

Under the terms of its license, the U. S. Metals Refining Company has been unable to market the ruthenium in its possession. Accordingly, the company has requested that the Commission remove this restriction.

The practical problems in regulating the use of ruthenium containing ruthenium-106 from fallout are formidable because of the widespread occurrence of ruthenium metal in many items of commerce where its presence may not be known. Even when the presence of ruthenium is known, the presence of ruthenium-106 would not normally be known by the processor of the item.

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* Available data indicate that refined ruthenium was imported into the United States in amounts ranging from 1,864 to 14,479 troy ounces annually from 1957 through 1962.

AUG 7 1964

From available information, it appears that only a very small percentage of ruthenium metal used in the United States is produced domestically. The probable result of exercising regulatory control over the low concentrations of ruthenium-106 in ruthenium metal would be to discourage the use of ruthenium in manufactured items and discourage the import of ruthenium metal for at least ten or twelve years. (With the cessation of weapons testing, the concentrations of ruthenium-106 continue to decrease by a factor of 1/2 each year). It is our view that the low risk to the public health and safety from the low concentrations of ruthenium-106 resulting from fallout does not justify such regulatory action.

In view of the practical difficulties in regulating ruthenium to control ruthenium-106 from fallout, and since we consider that present concentrations of ruthenium-106, from fallout, in ruthenium metal do not constitute an unreasonable risk to the common defense and security and to the health and safety of the public, we are informing the U. S. Metals Refining Company that it is no longer subject to the restrictions stated in Byproduct Material License No. 29-4628-1, as amended.

Director of Regulation

cc: W. B. McCool, Secretary (2)

CROSS-REFERENCE *(Name, number, or subject under which this form is filed)*		MH&S 3-
IDENTIFICATION OF RECORD	**DATE**	
	TO	
	FROM	
	BRIEF SUMMARY OF CONTENTS	BREN2- BARE REACTOR EXPERIMENT -NEVADA . During Operation Bren (1962) the Oak Ridge Naional Lab, Health Physics Research Reactor and nominal 1200 curie cobalt 60 sources provided neutron and gamma radiations for measurements .
FILED *(Name, number, or subject under which the document itself is filed)*		MR&A 7- EXPERIMENTS & TESTS 8-4-64

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AUG 1 1964

Dear Mr. Celebrezze:

The Atomic Energy Commission hereby submits its report on radiation protection activities for the year ending July 31, 1964 as requested in the Federal Radiation Council Memorandum for the President, dated September 2, 1960.

We believe that activities conducted by AEC licensees and contractors in connection with normal peacetime operations during the past year have been within the Council's Radiation Protection Guides and no deviation from the Guides is expected at this time.

The Commission has continued to notify promptly the Federal Radiation Council of any proposed or adopted regulations in areas covered by the Guides.

Sincerely yours,

Chairman

Honorable Anthony J. Celebrezze
Chairman
Federal Radiation Council
1815 H Street, N. W.
Washington, D. C.

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8-1-64

Copy filed: O.M.-7 Federal Radiation Council

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JUL 31 1964

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER BUNTING
COMMISSIONER PALFREY
COMMISSIONER RAMEY

July 30, 1964

STATUS OF PROPOSAL TO AMEND PART 20 FOR CONSISTENCY WITH RECOMMENDATIONS OF THE FEDERAL RADIATION COUNCIL

The proposed amendment was published in the Federal Register in September 1963. At the end of the comment period, the AEC was advised that the Department of Health, Education and Welfare wished to submit comments at a later date. A letter of February 13, 1964, from Secretary Celebrezze to the Chairman stated that DHEW did not understand why the AEC was proposing to raise strontium 90 and radium 226 levels when it has been possible to operate under more stringent standards and that, on the basis of information available to DHEW, it could not concur. A reply of May 7 from the Chairman to Secretary Celebrezze, discussed the proposed amendment in relation to recommendations of the Federal Radiation Council and offered to discuss the matter with Secretary Celebrezze if he continued to have reservations. There has been no response to the letter of May 7.

It is expected that a paper recommending Commission approval of the proposed amendment will be circulated to the Commission within a few days.

FEDERAL RADIATION COUNCIL
Executive Office Building
Washington 25, D.C.

September 2, 1960

MEMORANDUM FOR THE PRESIDENT

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

Pursuant to a decision of the Federal Radiation Council on July 5, 1960, a letter was sent from the Chairman of the Council to all Federal agencies considered as having radiation protection responsibilities which might fall under the Radiation Protection Guidance for Federal Agencies promulgated by the President, May 13, 1960. The purpose of the letter was to determine the degree to which the radiation protection activities of the Federal agencies were being conducted in conformance with this guidance. The letter also requested information on any deviations from the Guides which were planned under the provisions of Recommendation 7, which 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."

The following is a list of the agencies to which the letter was sent:

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

Attachment 1

The replies indicate that the Federal agencies are conducting their radiation protection activities in accordance with the Presidential guidance. Furthermore, the agencies indicated that as of the date of their report no deviations from the Guides were in effect or being planned.

In order to meet its statutory responsibility, "to advise the President on radiation matters directly and indirectly affecting health, including guidance to Federal agencies on radiation standards," the Council felt that a regular mechanism for receiving reports from the agencies should be developed. The following mechanism has been established:

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.

Consistent with Recommendation 7, the 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.

Arthur S. Flemming
Chairman

UNCLASSIFIED

August 10, 1962

AEC 604/67

COPY NO. 45

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

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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
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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
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General Counsel	17 - 21	Manager, Naval Reactors	61
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Congr. Liaison	30	Secretariat	67 - 72

Attachment 2

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.

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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.

JUL 31 1963

Dear Mr. Calabrese:

This report is in response to the Federal Radiation Council Memorandum for the President, dated September 2, 1960, that 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.

Our report of last year indicated that the staff of the Commission was considering the problems involved in adapting to the Commission's needs the guidance contained in Report No. 2 of the Federal Radiation Council. It is expected that revisions of our operating criteria and regulations reflecting these considerations will be available for transmission to the Council in the near future.

We believe that all AEC licensee and contractor activities, in connection with normal peacetime operations conducted during the past year, have been within the Council's Radiation Protection Guides.

Sincerely yours,

Chairman

DISTRIBUTION:
Chairman (2)
Commissioner Wilson
Commissioner Palfrey
Commissioner Ramey
Commissioner Tape
R. L. Price, REG
Secretariat (2)
GM OGC GC
AGMO OS LR

Rewritten 7/29/63. See attached yellow for additional concurrences.

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

OFFICE ▶		DIR RPS			OGC	REG
SURNAME ▶		Henry Wrenn			Shapar	HLPrice
DATE ▶	Attachment 3	7/29/63	7/ /63		7/ /63	7/29/63

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE: 16—69761-4

AUG 1 1964

Dear Mr. Celebrezze:

The Atomic Energy Commission hereby submits its report on radiation protection activities for the year ending July 31, 1964 as requested in the Federal Radiation Council Memorandum for the President, dated September 2, 1960.

We believe that activities conducted by AEC licensees and contractors in connection with normal generating operations during the past year have been within the Council's Radiation Protection Guides and no deviation from the Guides is expected at this time.

The Commission has continued to notify promptly the Federal Radiation Council of any proposed or adopted regulations in areas covered by the Guides.

Sincerely yours,

(Signed) James T. Ramey

Chairman

Honorable Anthony J. Celebrezze
Chairman
Federal Radiation Council
1815 H Street, N. W.
Washington, D. C.

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Secretariat (2)
OGC (2) AGMO
OS DBM DMA
CO ML RL SLR

See attached yellow for concurrences.
Retyped to incorporate OGC's editorial changes.
Attachment 5

OFFICE ▶	SS:SADIR					REG
SURNAME ▶	MBFitzpatrick:ewe	See attached for HLP's Concurr				
DATE ▶	7/3/64					7/ /64

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—82761-2

MHS-3

9

Doc. 452

DR/R-

FEDERAL RADIATION COUNCIL
WASHINGTON, D.C. 20449

July 29, 1964

Dear Mr. Chairman:

I would like to call your attention to the request of an annual report from your agency to be submitted to the Federal Radiation Council.

The reporting system approved by the President covers the following:

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.

For your information, last year's report was submitted from your office by letter dated July 31, 1963.

Please direct this year's report to:

Chairman, Federal Radiation Council
Room 1101 - 1815 H Street, N.W.
Washington, D. C. 20449

Sincerely yours,

Paul C. Tompkins

Paul C. Tompkins
Executive Director

Honorable Glenn T. Seaborg
Chairman, Atomic Energy Commission
Washington, D.C. 20545

Mills-3

United States Senate

COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS

July 29, 1964

DR. 452
C/J
GM/R-eow

Chairman Glenn T. Seaborg
Atomic Energy Commission
Washington, D. C. 20545

Dear Chairman Seaborg:

I have just received and read the Public Health Service proposal for evaluating the radiation injury to the people of Utah and Nevada resulting from the nuclear detonations at the Nevada Test Site since 1951.

It has been assumed for some time that there was considerable human population damage, but the full impact of that damage from the intake of Iodine-131, especially to children, is apparent in the scope of the Public Health studies which are planned. They include both extensive morbidity and mortality studies, and it will, of course, be years before there can be any conclusive results.

I supported the Nuclear Test Ban Treaty and am greatly relieved by the fact that above-ground tests have been barred, and that all tests now being conducted are underground tests. I know there is far less danger of radiation from underground tests, but I understand that tests do "vent" and allow the escape of radioactive dust, which causes the release of radiation.

Because Utah people have already been exposed to relatively greater amounts of fresh fission products from nuclear detonations than the people of almost any other state in the union, I want to be sure that they are not going to be subject to any further such hazards. To what extent are there human population dangers through continued underground

7-29-64

testing at the Nevada Test Site? If there is danger, I demand a cessation of testing until there is absolute assurance that radioactive poisoning will not reach our people.

Sincerely,

Frank E. Moss

Frank E. Moss
United States Senator

Donald L. Snow, Editor
Radiological Health Data
Public Health Service

JUL 17 1964

Duncan Clark, Director
Division of Public Information, AEC

Signed
Duncan Clark

TRANSMITTAL OF REPORT, "NEVADA TEST SITE SURVEILLANCE"

DPI:FT

Attached for use in Radiological Health Data is a report on Nevada Test Site Surveillance. The report summarizes the off-site radiological situation following Bandicoot (October 19, 1962), Yuba (June 5, 1963), Eagle (December 12, 1963) and Pike (March 13, 1964).

Attachment

cc: A. R. Luedecke, General Manager
W. B. McCool, Secretary
G. M. Dunning, D/Dir., DOS
Roy Maxwell, DOS

7-17-64