L&R File Copy — 8 pp.

50-205

APR 24 1963

Dr. M. L. Heideman, Jr.
353 Race Street
Berea, Ohio

Dear Dr. Heideman:

Your letter of March 26, 1963, addressed to President Kennedy, has been referred to the Atomic Energy Commission for consideration.

We note your concern for the safety of persons in the area surrounding the proposed reactor site at Bodega Bay and for the conservation of natural resources.

Enclosed is a pamphlet prepared by the Commission's Division of Public Information concerning the licensing of power reactors. I hope you will find it reassuring concerning the discharge by the Atomic Energy Commission of its responsibility relative to the health and safety of the public.

Before the Commission can consider issuance of a permit authorizing the Pacific Gas & Electric Company to construct the proposed plant at the proposed site, the Commission's Division of Licensing and Regulation will make a comprehensive safety evaluation of the proposal, the Commission's Advisory Committee on Reactor Safeguards will thoroughly review the application and a public hearing will be held before an Atomic Safety and Licensing Board or an AEC Hearing Examiner, as required by law. After the issuance of an Initial Decision by the Atomic Safety and Licensing Board or the Hearing Examiner, the entire hearing record is subject to review by the Commission. The hydrological, meteorological, and geological aspects of the site, including the effects of earthquake on the proposed plant, will be thoroughly explored in the course of review by the Commission's staff and the Advisory Committee on Reactor Safeguards. The purpose of these extensive procedures is to assure thorough consideration of all aspects of the proposed plant bearing upon the question whether the reactor can be constructed and operated at the proposed site without undue risk to the health and safety of the public. However,

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zoning questions, conservation matters and the esthetics of the site are not within the jurisdiction of the Atomic Energy Commission and, therefore, are not considered in the course of the review and evaluation of the application which I have just described. A copy of your letter of March 26th and a copy of this letter are being referred to the Fish & Wildlife Service, United States Department of the Interior, for reply to the broad questions of conservation of resources which you raise.

As you know, the Advisory Committee on Reactor Safeguards is a Committee established by the Congress to advise the Commission on questions of reactor safety. It is made up of scientists and engineers who are eminently qualified in reactor technology. The reports of the Committee are made available to the public and announced by the Commission. The analysis of the safety aspects of the proposed reactor prepared by the Division of Licensing and Regulation will also be available to the public. This analysis will set forth the position which the Regulatory Staff will take at the public hearing. At that hearing, which will be held in California on a date and at a place to be announced, members of the Regulatory Staff will appear to explain their evaluation of the safety of the proposed reactor. Moreover, an opportunity to participate in the hearing is afforded the public pursuant to the Commission's "Rules of Practice", 10 CFR Part 2, a copy of which is enclosed. I feel sure that these procedures will enable all interested persons in the area to acquaint themselves with the details of the proposal and with the Regulatory Staff's evaluation thereof.

Sincerely yours,

(Signed)
Eber R. Price, Assistant Director
Division of Licensing and Regulation

Director
Division of Licensing
and Regulation

Enclosures:
As stated above

bcc: OGC
C. T. Edwards
Eber Price

cc: Mr. Clarence Pautzke, Commissioner
Fish & Wildlife Service
U. S. Department of the Interior
Washington 25, D. C.

OFFICE ▶	DLR	OGC	DLR	DLR		
SURNAME ▶	CTEdwards:bmj		ERPrice	RLowenstein		
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For your information

Larry McEwen

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~~H. Price~~ 53
~~Clare~~
~~Bloomstein~~

GENERAL ELECTRIC COMPANY
ATOMIC POWER EQUIPMENT DEPARTMENT
175 CURTNER AVENUE
SAN JOSE, CALIFORNIA

50-205
Suppl. only

April 25, 1963

Mr. Gene Benedetti, Manager
Petaluma Co-op Creamery
Petaluma, California

Dear Mr. Benedetti:

The General Electric Company, which will furnish the atomic reactor for Bodega Bay, has designed the boiling water reactors now in service at the Vallecitos Atomic Laboratory, near Livermore; at Eureka, California; at Dresden, near Chicago; plus one each in Michigan and Germany. In addition, for 16 years the Company has operated, for the Atomic Energy Commission, the Hanford Works in the state of Washington, which involves eight reactors and two chemical separations plants.

This long experience in the operation of nuclear facilities, and data secured over several years from boiling water reactors similar to that to be provided at Bodega Bay, indicate that operation of this plant will have no effect on milk produced in Sonoma and Marin counties. Further information bearing on this is attached.

Very truly yours,

L. H. McEwen

L. H. McEwen, Manager
Nuclear Safety Engineering

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Attach.

To File, LTK 6-4-63

ENVIRONMENTAL ASPECTS
OF
BOILING WATER NUCLEAR POWER PLANTS

Atomic fission involves generation of radioactive isotopes such as iodine-131 and strontium-90. In weapons testing, these materials are released directly to the atmosphere and ultimately deposit on the ground. In nuclear power reactors such materials are instead retained within fuel elements inside the reactor itself. Radioactive isotopes are released from the fuel elements when they are ultimately dissolved in acid, in what is termed a chemical separations plant, or when fuel is taken apart for study in an atomic laboratory; the facility to be built at Bodega Bay does not involve operations of this sort.

This important distinction between power reactors and chemical separations plants may not be generally understood. Those unfamiliar with the atomic industry might therefore mistakenly interpret the release of radioactive materials from chemical separations plants as referring to reactor operations. One can see what this difference amounts to by looking at some figures from the chemical separations plants at Hanford and from the Dresden Nuclear Power Station of the Commonwealth Edison Company, a large boiling water reactor near Chicago, which has been in operation for over three years.

For many years, iodine-131 has been released to the atmosphere at the Hanford chemical separations plants. This release, which is under continuous careful control, is currently such that the amount deposited on vegetation is indistinguishable from background more than three miles from the stack. It is easier to measure iodine in milk than in grass, yet the Hanford contribution of iodine-131 in the nearest milk production area, 15 miles away, cannot be distinguished.

In 1962, emission of iodine-131 from the Dresden reactor was about <u>5000 times less</u> than that from the Hanford separations plants. We cannot make a more precise estimate because such releases are extremely difficult to measure; the amounts from Dresden are far too small to be measured on vegetation or in milk. In every way, operation of the Dresden reactor has indicated that large, direct-cycle boiling water reactors will have no significant radiation effects on the surrounding area.

For example, Dresden plant operation, throughout the entire year of 1962, created a maximum radiation exposure for any person living near the plant of about 1/1000 of the permissible dose established by international authorities on radiation protection. This dose from Dresden operation was about 0.5 millirem, which may be compared with the ever-present natural background radiation, to which all people are, and have been always exposed, of about 150 millirem per year.*

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* As a matter of information, the reader may be interested in knowing that part of this natural background radiation arises from the consumption of food. Edible things of all kinds, including grass, hay, and milk, have always contained radioactivity. This comes from potassium, a naturally occurring element found in soil and commonly an important ingredient of fertilizers. All forms of potassium contain potassium-40, a radioactive isotope with a half life of about one billion years. For example, alfalfa contains about 20 micromicrocuries of radioactive potassium-40 per gram; it was thus long before atomic energy was dreamt-of.

The results of field measurements of radioactivity near the Dresden plant in 1962 may be also of interest. As expected, milk samples from three nearby farms, and from vegetation in the area showed radioactivity consistent with samples taken in other areas by the National Surveillance Network, indicating no detectable contributions attributable to the nuclear power station. Airborne radioactivity from the plant was indistinguishable in measurements made at 18 monitoring stations up to 15 miles from the plant. Likewise, samples of river water and mud from upstream and downstream of the plant showed no measureable increase in radioactivity from plant operations. Calculations show that the plant increased the natural background radioactivity in the river by less than one percent.

Experience at General Electric's Vallecitos Atomic Laboratory is similar. At this laboratory, the Vallecitos Boiling Water Reactor is operated with intentionally defected fuel to determine what would happen in a power plant under these circumstances. Also, fuel elements are taken apart for study in special laboratories; iodine-131 is released under such conditions. Measurements show that grass in the laboratory area contains from one-tenth to one-half of one micromicrocurie of iodine-131 per gram. That is, from one-tenth to one-half of one millionth part of one millionth part of one curie. Since this is such a minute level, determination of the portions of this which came from weapons testing and from plant operations have not been made. The bulk of that which has come from plant operations is associated with disassembly of fuel in the laboratories and not from the reactor.

Study of the records will show two instances where iodine-131 and strontium-90 were emitted from atomic reactors in significant quantity. Because longer half-life isotopes, such as strontium-90, happen to be far less volatile than iodine, these were emitted in far smaller quantity; the amount of strontium-90 was less than 1/1000 that of the iodine. Both cases, one in England and one in Idaho, pertained to reactor accidents.

These two accidents were in reactors importantly different from modern boiling water reactors, especially in that they were provided with no containment. Power reactors, such as that to be built at Bodega Bay, are provided with containment facilities, or provisions to contain and hold any radioactive materials which might escape from a reactor under accident conditions. The containment features of the Bodega Bay reactor are exceptional; whatever radioactive materials could conceivably leak from the containment pass not to the outside, but to a structure which features special equipment which will remove iodine-131 and strontium-90. The possibility that significant quantities of either isotope could be released from the Bodega Bay reactor under accident conditions is virtually zero.

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April 25, 1963