Enclosure 8

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MAR 18 1978

The Honorable Christopher J. Dodd
United States House of Representatives
Washington, D. C. 20515

Dear Congressman Dodd:

This letter is in response to your letter of November 15, 1977, requesting the Nuclear Regulatory Commission to evaluate a report submitted to you by Dr. E. J. Sternglass concerning strontium-90 and cesium-137 in milk from farms near Connecticut nuclear power plants.

Based on a preliminary review of the report, we cannot establish any relationship between the somewhat elevated level of radioactivity in the milk and the operation of the nuclear power plants. This conclusion is primarily based on our review of the licensee's periodic radioactive effluent and environmental monitoring reports. This situation has also been examined in detail by the NRC Regional Office responsible for the Millstone and Haddam Neck plants. The Regional Office confirms this analysis. The conclusions of Dr. Sternglass that the levels of Sr-90 and Cs-137 are of plant origin are unsubstantiated by the data. All effluent releases from the facilities are continually monitored and controlled to account for all radioactivity released to the environment and to limit the quantities released. The measured Sr-90 and Cs-137 releases from the plants were insignificant in terms of calculated environmental radiation doses and could not result in the levels of radioactivity measured in the milk. The relative absence of Sr-89 and Cs-134, which are released in reactor effluents in comparable quantities as Sr-90 and Cs-137, provides additional verification that the levels are not plant-related.

In any event, regardless of the source of radioactivity, Dr. Sternglass' extrapolations to population doses and related health costs are incorrect. His assumptions of total diet intake of radioactivity and exposed populations are unrealistic and overestimate the actual population doses.

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A detailed response to the full report will require several months to prepare. However, on the basis of our preliminary review, we have addressed the three specific questions asked in your November 15 letter. We trust that the enclosed is responsive to your concerns and questions. Upon completion of the requested in-depth evaluation of Dr. Sternglass' report, a more detailed assessment of the situation will be provided to you.

Sincerely,

Joseph M. Hendrie
Chairman

Enclosure:
Preliminary Evaluation of
Dr. Sternglass' Report

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PRELIMINARY EVALUATION OF DR. STERNGLASS' REPORT,
"STRONTIUM-90 LEVELS IN THE MILK AND DIET NEAR
CONNECTICUT NUCLEAR POWER PLANTS"

Question

"Do you consider the amounts of strontium-90 found in the milk and diet around the Connecticut plants to be unrelated to plant operations? If so, why?"

Answer

The apparent high levels of Sr-90 in the milk around the Connecticut plants are unrelated to plant operation, based on our review of the licensees' reported radioactive effluents and environmental monitoring data. This apparent anomaly has also been under examination over the past several years by the NRC Inspection and Enforcement Regional Office responsible for the Millstone and Haddam Neck plants. The Regional Office has not been able to establish any potential pathway of environmental transport from the Connecticut plants to the milk which would account for the levels observed.

All effluent releases from the facilities are continually monitored and controlled to account for radioactivity released to the environment and to limit the quantities released. The NRC Regional Office has examined the licensees' radioactive effluent monitoring and control procedures, including sampling and analytical methods and quality control procedures. Also, the NRC conducts a radioactive effluent sample splitting program with the licensees' to provide additional verification of the accuracy of the licensees' measured effluent quantities. In this way, we are assured of the accuracy of the licensee-measured radioactive release values. For 1976, which is the

year of highest measured milk values, the measured radioactive effluent released from the facilities could have resulted only in a very low level of contamination, amounting to less than 0.001 picoCuries per liter of milk, which is less than one-thousandth of the value measured in the milk. Thus, the measured Sr-90 and Cs-137 releases were insignificant in terms of calculated environmental radiation doses and could not result in the levels of radioactivity measured in the milk.

The absence of strontium-89 indicates that the radioactivity is not from reactor facility releases. Sr-89 behaves chemically and biologically the same as Sr-90 and is more abundant than Sr-90 in reactor effluents. If the levels in milk were a result of facility releases, then the quantity of Sr-89 should exceed the levels of Sr-90; however, this was not the case. Sr-89 has a relatively short half-life (50 days) compared to Sr-90 (28 years). Therefore, the absence of Sr-89 indicates that the measured levels of Sr-90 in the milk are a result of radioactivity that originated at least several years ago. Similarly, the relative absence of the shorter half-life Cs-134 (2.1 years) and I-131 (8 days) that are also released from the facilities in comparable quantities indicates that the radioactivity in the milk is not from plant operation but appears to be fall-out from past nuclear weapons testing. As expected, a short-term increase in Sr-89 levels was observed following the Chinese weapon test in 1976.

Question

"Are levels of strontium-90 taken into account when federally regulated testing of the environment around the nuclear power plants takes place to measure controlled substances? If not, why not?"

Answer

The releases of radioactivity from nuclear power plants are measured and controlled to limit any potential environmental impact to a negligible effect. In addition, the NRC also requires sampling of the environs around reactors to verify the in-plant controls and provide reasonable assurance that the predicted environmental doses (based on measured radioactive effluents) are not substantially underestimated and are in compliance with applicable standards.

Strontium-90 is routinely evaluated in both the radioactive effluent releases and the environmental sampling media at Millstone and Haddam Neck. The radioactive effluents and measured levels of radioactivity in the environment around Millstone and Haddam Neck are routinely reviewed by the NRC. If abnormally high levels of radioactivity are measured either in the plant effluents or the environmental media, an NRC review of the situation is conducted to identify the cause and determine if any corrrective action is needed. The Sr-90 in the milk from farms around these facilities has been determined not to be of plant origin. Therefore, no plant corrective actions would improve the situation.

On the basis of our analysis to date of nuclear power plant radioactive effluents and the important environmental dose pathways to man, we have concluded that neither Sr-89 nor Sr-90 are significant dose contributors to man from normal plant operation. NRC guidance on requirements for radiological environmental monitoring is therefore being revised to delete the routine analysis for Sr-89 and Sr-90 in sampling media. These nuclides, however, will continue to be monitored in plant effluents. For selected plants, where elevated environmental levels of Sr-90 have been detected in the past or where unexpected high levels of Sr-89 and Sr-90 are found in effluent releases, the need for environmental sampling and analysis will be determined on a case-by-case basis. We anticipate that measurements and analyses of the relative amounts of Sr-89 and Sr-90 will continue to be required around the Millstone and Haddam Neck facilities to provide continued assurance that the environmental radioactivity levels are not the result of plant operation.

Question

"Are the levels of Sr-90 calculated by Dr. Sternglass accurate? Do the professor's extrapolations, in terms of the total bone and body doses received by the population surrounding the plants, have scientific validity? If not, why not?"

Answer

The levels of Sr-90 in the milk around Millstone were measured through the routine radiological environmental monitoring program conducted by Northeast Utilities. Based on our evaluation of the monitoring program to date, we

believe that the measured levels of Sr-90 are accurate. Dr. Sternglass used these measured values as his starting point in determining the plant-related individual and population radiation doses. However, as already discussed, the Sr-90 is not a result of Millstone operation. Therefore, the professor's extrapolations, in terms of plant-related radiation doses, are a substantial misrepresentation of the environmental impact of plant operation.

Moreover, the methodology of dose calculation employed by Dr. Sternglass is overly conservative. The professor's assumptions of total diet intake of Sr-90 and exposed populations are unrealistic and overestimate the actual population doses. Dr. Sternglass' calculational procedures will be addressed in more detail by the NRC in a detailed critique of the full report at a future date.