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Yankee Atomic Electric Company  
441 Stuart Street  
Boston 16, Massachusetts

JAN 18 1963

Attention: Mr. Roger Coe  
Vice President

Gentlemen:

It has recently come to my attention that a mixture of hydrogen and oxygen ignited inside the containment system of one of the Commission-operated reactors and caused some superficial blast and fire damage. Since it may be possible that such a condition could occur elsewhere, I am writing this letter to describe the circumstances of the incident so that you may review the design of your facility for any potential danger points in the light of this experience.

The hydrogen gas was found to have evolved from two sources. These were radiolytic decomposition of the shield water in which the reactor is situated and radiolytic decomposition of the primary coolant water. The hydrogen reached the vapor container atmosphere via evolution from the free surface of the shield water pool and via leakage through valve packing from the vapor phase of the pressurizer. During continued operation of the reactor with the containment system sealed, the hydrogen accumulated in a stagnant pocket in the upper regions of the containment system until a combustible concentration was reached. An electrical spark in this region or the hot surface of one of the components in conjunction with a chemical promoter such as ozone, ammonia, or nitrogen peroxide is believed to have ignited the mixture causing a typically rapid increase in pressure.

In view of this incident, it is suggested that you review the design of your facility for any such sources of hydrogen or other combustible gases which could reach locations within your facility where stagnant pockets might form and accumulate to combustible concentrations. Attention should also be given to explosion-proofing electrical devices or other equipment which might otherwise be capable of igniting such gases.

Sincerely yours,

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