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Dr. Beck

A. A. Wells, Director
Division of International Affairs

DEC 2 1958

Harold L. Price, Director
Division of Licensing and Regulation

PARTIAL REPLY TO QUERIES OF THE JAPANESE ATOMIC INDUSTRIAL FORUM

Attention: Richard Barnes

The following is a partial reply to queries of the Japanese Atomic Industrial Forum:

3. Containment:

The discussion here is confined to power reactors.

In principle, high integrity containment vessels around reactor facilities are not required for all power reactors near populated areas. Basically, it is intended that such vessels will be required when there exists a credible possibility that an accident could occur which would release substantial amounts of the radioactivity inventory. If only a single failure of equipment or one operational error could cause a fission product-releasing accident, the possibility of its occurrence would be considered credible, and a containment vessel would be required. In other cases, whether or not a fission product-releasing accident would be considered credible depends on evaluative judgment, and a conservative approach is usually taken.

In practice, most power reactors near populated areas thus far constructed or nearing construction are of the pressurized water variety, and for such reactors it is usually considered credible that a single major failure of the high pressure primary cooling system, with its attendant consequences, could lead to major fission product release. Hence high integrity containment vessels have been provided.

There are reactors now in the planning stages for which fission product releasing accidents do not appear nearly so likely as for high pressure water reactors, and for these, containment in the usual sense, may not be required. Also, on some reactors, different containment schemes from the usual high integrity (high-pressure, low-leakage) steel vessels may be considered. Where fission products may be released from the reactor, but their release would not be attended by high pressure build-up, continuous exhaust ventilation of the relatively high-leakage housing enclosure through filters and scrubbers may be acceptable for certain locations.

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By this scheme, building leakage is into the building, and the filtered scrubbed gases consist of only the relatively less dangerous noble gases.

Another scheme might be suitable for reactors in which large pressures might be built up in the containment vessel, but released radioactivity would only appear after the pressure. In this case, relatively low pressure capacity containment vessels may be provided. These would be equipped with large openings capable of being rapidly closed. In case of accident, the high pressure surge would be vented through the openings, which would then be closed and the building then would be expected to retain any subsequently released radioactivity.

In all cases, whether or not a containment building is needed and, if so, what type and with what pressure and leakage specifications is determined by analysis and evaluation of the reactor in question at the location proposed.

HKB:DL&R DL&R

C.K.Beck:mma H.L.Price
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A. A. Wells, Director
Division of International Affairs

JAN 21 1959

Frank K. Pittman, Director /s/ J.M. STRAEBLER for
Division of Reactor Development

PREPARATION OF ANSWERS TO JAPAN ATOMIC INDUSTRIAL FORUM QUESTIONS

SYMBOL: RD:CR:RS:HGH

This is in response to your memorandum of December 24, 1958. Pursuant to your request, our reply is confined to items 2c, 2d and 3 of "Questions of Japan Atomic Industrial Form, Tokyo, Nov. 27, 1958."

Item 2. United States Policy for International Cooperation

c. Port regulations etc. for around-the-world cruise of the N S Savannah.

This matter was discussed with Mr. Masaru Masaki (of the Tokyo Marine & Fire Insurance Co.) during his visit, in December 1958, with the Joint Maritime Administration-AEC Group. He was told of the set of rules for the design and construction of nuclear ships which was proposed informally by a Working Party of the U.K. Ministry of Transport. During our discussions with the U.K. it was suggested that a similar set of operating rules and port regulations was equally desirable. The U.K. will propose such a set in February 1959. It has been proposed that a small working group representing the eight or ten principal maritime nations meet later in the year in London to consider both sets of rules.

If general agreement is reached at the working party level, it is hoped that the United States can then present its plan for the operation of the ship to authorities of those nations to be visited by the N.S. Savannah. This plan would contain a description of the ship and her operating procedures.

Firm plans have not been made for action beyond the London meeting. It is quite possible that further discussion and

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acceptance of a uniform set of nuclear ship design, construction and operating rules could best be carried on under the aegis of the IAEA. State Department representatives have indicated their approval of our general plans.

d. Legal and indemnity considerations.

These matters were also discussed with Mr. Masaki. It is assumed that the JAIF representatives are aware that the 85th Congress extended the Price-Anderson indemnity provisions to the Savannah (Atomic Energy Act of 1954, Sect. 170). It will be necessary for the AEC and Maritime Administration to make some policy determinations under this agreement with regard to nuclear and non-nuclear incidents and the pyramiding liability arising therefrom.

One provision of the Atomic Energy Act of 1954 will require amendment prior to the visit of any foreign nuclear ship to the United States. Section 52 of the Act provides that all rights, titles, and interest in or to any special nuclear material within or under the jurisdiction of the United States, now or hereafter produced, shall be the property of the United States.....

The question regarding owner and operator relationship is academic thus far. The United States Government is, and will continue for some time to be, the owner of the N.S. Savannah. The operator will be a general agent (cost-type contractor) of the Government. As the nuclear program develops private operation will become common but in most instances the owner will be the operator. If the owner were to charter a nuclear ship to an operator, the latter would be required to have an AEC license to operate the vessel and, as licensee, would be required to obtain insurance in accordance with the Price-Anderson Act. The Nuclear Energy Liability Insurance Association has indicated that it will provide insurance to the N.S. Savannah and to future nuclear merchant ships. Policy provisions and definitions of liability have not yet been agreed upon between this group and marine underwriters' groups; details cannot be given at this time but the principle has been accepted.

3. <u>United States Reactor Containment Practice</u>

The United States does not specify that all reactors, without exception, be contained as stated by the Japan Atomic

Industrial Forum. The U. S. present practice varies from absolute containment on one hand to no containment on the other. Between these two is an area of limited containment or "confinement."

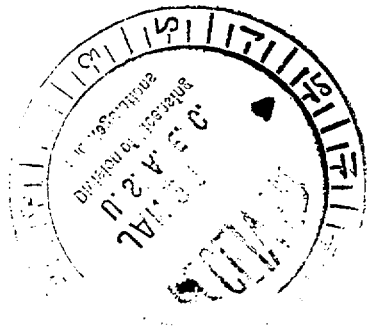
Absolute containment consists of housing the reactor in a steel sphere or a spherical domed cylinder. This type containment vessel is used for a reactor that is of relatively high power and capable of relatively large and potentially destructive energy releases. The vessel is carefully leak tested so that all released fission products will be contained.

Intermediate containment, i.e. confinement, consists of conventional industrial housing with built in provisions for specifically exhausting the interior through fission product filters and scrubbers. The building is caulked to provide a measure of leak tightness and is maintained at a negative pressure with respect to the outside atmosphere. A reactor in which there is small liklihood of disruptive energy release would be a candidate for this type containment.

Many reactors have no containment at all. These consist for the most part of low power research reactors.

The use of (a) containment, (b) confinement or (c) no containment in the United States is in general a function of (1) the reactor power level, (2) type of reactor and (3) location of the reactor in respect to population density.

cc: R. P. Godwin, DRD
H. L. Price, L&R



Dr. Beck

Clifford K. Beck, Chief
Hazards Evaluation Branch

JAN 10 1956

R. H. Wilcox

PROPOSED REVISION OF PART 50

Attached you will find draft 3 of "Part 50 - Revision of Facility Licensing Regulation", and the draft of "Standards for Permits and Licenses" on which you requested comments at our last Staff meeting.

Please note that my comments and suggestions are those in red, the marks in ink were only for my own information.

Enclosure:
As stated above

HKB:DL&R

R.Wilcox:mma
1/16/56