



52-002

UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 2, 1996

Mr. Nicholas J. Liparulo, Manager  
Nuclear Safety and Regulatory Activities  
Nuclear and Advanced Technology Division  
Westinghouse Electric Corporation  
P.O. Box 355  
Pittsburgh, Pennsylvania 15230

SUBJECT: REVIEW OF AEROSOL REMOVAL MECHANISMS IN THE AP600 CONTAINMENT  
FOLLOWING A POSTULATED DESIGN BASIS ACCIDENT

Dear Mr. Liparulo:

In your letter dated August 5, 1996, Westinghouse provided a technical position paper on aerosol removal from the AP600 containment atmosphere following a postulated design basis accident. In the cover letter, Westinghouse stated that "... providing additional, arbitrary conservatism by reducing the calculated aerosol removal rate [by the staff] is unnecessary and is inconsistent with the objective of NUREG-1465 to provide more realistic portrayal of the amount of fission products present in the containment."

As stated in its July 17, 1996 letter, the staff has not yet established its technical position on this matter for the AP600 design described on the docket. The information provided in that letter was given to help you understand the concerns of the staff and its contractor on this issue. The staff may elect to use information from a variety of sources (including contractors) in its technical evaluations; however, as stated in the July 17, 1996 letter, the staff has not completed its review of this matter. The staff will make the final determination on its assessment of the appropriate aerosol removal rates in the AP600 containment, and the technical bases used for such determination will be provided in the forthcoming AP600 safety evaluation. However, it is the understanding of the staff from Westinghouse's August 8, 1996, presentation to the Advisory Committee on Reactor Safeguards and recent discussions with your staff that Westinghouse has modified certain parameters provided to the staff in your letter dated April 7, 1995, in response to request for additional information (RAI) Q470.23, and, therefore, Westinghouse may have modified its design of the AP600. The staff will recalculate aerosol removal rates using the revised parameters provided by Westinghouse. Therefore, because this matter is still under review by the staff, we believe that the aforementioned conclusion by Westinghouse is premature.

The staff agrees with Westinghouse that the values proposed in NUREG-1465 are realistic and reflect best estimates for the range of plants and sequences considered. The staff is proposing to use the fission product release fractions, release timing, and its chemical forms from the NUREG for the AP600 design certification review. However, while these values are realistic and best estimate treatment may be appropriate for severe accident considerations,

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the staff concludes that the use of realistic assumptions for the entire design basis accident evaluation may not be appropriate because of the uncertainties that remain.

In addition, in a letter from the Electric Power Research Institute (EPRI) to the Chairman, "Policy Issues Pertaining to the AP600 Design," dated August 27, 1996, EPRI stated that "... very recent discussion between Sandia [Sandia National Laboratories, Albuquerque, NM] and Westinghouse is expected to lead to some refinement of the Sandia input to the NRC ..." If Westinghouse, Westinghouse's contractors, EPRI, or EPRI's contractors who work on the AP600 project discussed these matters with an NRC technical contractor (Sandia National Laboratories) outside of a public forum and not incidental to, for example, a chance encounter, provide a detailed summary of discussions held. These must be made part of the record and will be made available to the public.

Enclosed is a RAI (Q470.38 - Q470.40) that must be satisfactorily addressed in order for the staff to complete its review of this issue. If you have any questions or comments regarding these matters, you can contact the Project Manager, Thomas Kenyon, at (301) 415-1120.

Sincerely,

original signed by:

Theodore R. Quay, Project Director  
Standardization Project Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

Docket No. 52-002

Enclosure: As stated

cc w/enclosure:  
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Mr. Nicholas J. Liparulo  
Westinghouse Electric Corporation

Docket No. 52-003  
AP600

cc: Mr. B. A. McIntyre  
Advanced Plant Safety & Licensing  
Westinghouse Electric Corporation  
Energy Systems Business Unit  
P.O. Box 355  
Pittsburgh, PA 15230

Mr. John C. Butler  
Advanced Plant Safety & Licensing  
Westinghouse Electric Corporation  
Energy Systems Business Unit  
Box 355  
Pittsburgh, PA 15230

Mr. M. D. Beaumont  
Nuclear and Advanced Technology Division  
Westinghouse Electric Corporation  
One Montrose Metro  
11921 Rockville Pike  
Suite 350  
Rockville, MD 20852

Mr. S. M. Modro  
Nuclear Systems Analysis Technologies  
Lockheed Idaho Technologies Company  
Post Office Box 1625  
Idaho Falls, ID 83415

Letter to be distributed to the following addressees after the result of the proprietary evaluation is received from Westinghouse:

Mr. Ronald Simard, Director  
Advanced Reactor Programs  
Nuclear Energy Institute  
1776 Eye Street, N.W.  
Suite 300  
Washington, DC 20006-3706

Ms. Lynn Connor  
DOC-Search Associates  
Post Office Box 34  
Cabin John, MD 20818

Mr. James E. Quinn, Projects Manager  
LMR and SBWR Programs  
GE Nuclear Energy  
175 Curtner Avenue, M/C 165  
San Jose, CA 95125

Mr. Robert H. Buchholz  
GE Nuclear Energy  
175 Curtner Avenue, MC-781  
San Jose, CA 95125

Barton Z. Cowan, Esq.  
Eckert Seamans Cherin & Mellott  
600 Grant Street 42nd Floor  
Pittsburgh, PA 15219

Mr. Sterling Franks  
U.S. Department of Energy  
NE-50  
19901 Germantown Road  
Germantown, MD 20874

Mr. Frank A. Ross  
U.S. Department of Energy, NE-42  
Office of LWR Safety and Technology  
19901 Germantown Road  
Germantown, MD 20874

Mr. Charles Thompson, Nuclear Engineer  
AP600 Certification  
NE-50  
19901 Germantown Road  
Germantown, MD 20874

Mr. Ed Rodwell, Manager  
PWR Design Certification  
Electric Power Research Institute  
3412 Hillview Avenue  
Palo Alto, CA 94303

**REQUEST FOR ADDITIONAL INFORMATION  
ON THE AP600 DESIGN**

The technical bases provided in your August 5, 1996, submittal rely on (1) standard textbook formulae for sedimentation, diffusiophoretic, and thermophoretic processes, (2) aerosol removal coefficients calculated by Westinghouse for the initial period after onset of core damage and for the remainder of the first 24 hours of the accident, and (3) the STARNAUA code dated February 23, 1996. In order to complete our review, the staff needs the following additional information concerning natural aerosol removal mechanisms in the AP600 containment:

470.38      Provide a description of the models used in the version of the STARNAUA code used by Westinghouse to calculate aerosol removal rates, associated user documentation, and the code inputs used and outputs obtained in calculating the aerosol removal coefficients ( $\lambda$ mdas). In addition, the staff requires access to this version of the code, including the code validation and verification (V&V) and quality assurance (QA) documentation.

In your letter dated August 5, 1996, Westinghouse stated that the STARNAUA code was specifically validated against mod. 4 of the NAUA code for the case of no steam condensation on particles or walls, and validated against the NAUAHYGROS code for both dry and wet cases. The staff requires access to these specific validation reports as well.

470.39      Provide aerosol removal coefficients as a function of time and the uncertainty distribution for each time step (0.1 hour) after the postulated design basis accident over the first 24 hours.

470.40      In your letter dated August 29, 1996, Westinghouse updated its assumptions for aerosol sedimentation area available inside the AP600 containment. For each floor and heat sink sedimentation area, provide the corresponding elevation, isometric drawings, and vertical separation distances from the adjacent floor and/or heat sink sedimentation area. Additionally, identify impediments (e.g., structures) to full circulation through such volumes.

Enclosure