QUESTION #1 - To what extent has the staff checked the input numbers
and the calculations that Westinghouse made to be sure
there are no errors in the calculation which would
lead to temperatures higher than 2300 degrees?

ANSWER - The computer codes SATAN and LOCTA, currently used by

Westinghouse for evaluation of loss-of-coolant accidents

require in excess of 2000 input values before a calcu-

lation can be performed. The majority of these values

represent details of geometry and fluid conditions for

the reactor coolant system. The staff does not verify

each input parameter necessary to perform the calculation.

Instead, we perform independent calculations of accident

consequences with Commission-developed computer codes

using the geometric, thermal, and hydraulic details of

the primary and secondary cooling system. As part of

this calculation, significant input parameters such as

fuel and clad thermal properties, core heat flux

distribution, primary system flow resistances, and break

location and character are verified.
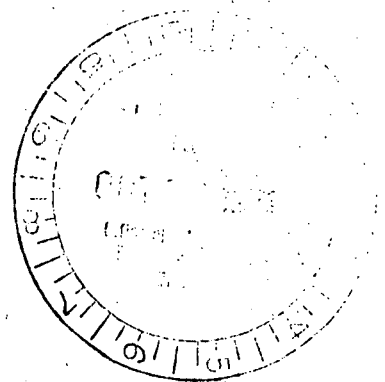
QUESTION #2 - Has an independent calculation been performed to determine the consequences of rupturing the largest pipe for the Indian Point 2 plant?

ANSWER - Yes, this analysis was performed by our consultants, the Aerojet Nuclear Corporation (ANC), during August and September 1970. The results of this calculation were in agreement with the analysis submitted by the applicant in Supplement 12 of the FSAR. We have also done other checks of analysis techniques of the NSSS vendor, Westinghouse. A more recent check of these techniques has been performed for the Turkey Point Reactor, a 3-loop pressurized water reactor designed by Westinghouse. The results of these studies show that the Westinghouse analytical techniques using the SATAN and LOCTA codes predict clad temperatures at end of blowdown approximately 100 degrees higher than our calculation, using the AEC developed codes RELAP and THETA. We would anticipate similar results for the Indian Point 2 plant.

QUESTION #3 - If the LOCA analysis was performed with the RELAP
            Code and by staff personnel, are all of the plant
            characteristics known so accurately, and are the
            bases for the program so similar that the calculated
            maximum temperatures would be identical? If not,
            would it be expected that the RELAP code would
            calculate higher or lower temperatures?

ANSWER   - The nuclear, thermal, hydraulic, and ECCS characteristics,

            are supplied by the applicant, and are verified during

            pre-operational and startup tests where possible.

            Certain parameters such as the nuclear peaking factors

            are restricted by the Technical Specifications. The

            staff in all of its independent analyses obtains

            detailed data concerning the primary system from the

            reactor manufacturer. Comparisons between the SATAN

            and RELAP code calculated results of important variables

            such as core flow and core quality do result in a similar

            trend behavior but different detailed results. This is

            to be expected since the code and its user options permit

            variations such as the primary system modelling which is

            different in terms of the number of control volumes used

            to represent the primary system, and the numerical techniques

            used to solve the equations which also differ and could

            result in small differences in calculated results.

            The best comparative example to date was performed for a

            3-loop plant similar to the Turkey Point plant. Westinghouse,

            using its approved evaluation model (Appendix A, Part 3)

            published in the Commissions Interim Acceptance Criteria,

predicted a peak clad temperature at the end of blowdown

of about 1550°F. We predicted a peak clad temperature of

1450°F at the end of the blowdown using the AEC evaluation

model published in the same Commission statement.