ENCLOSURE 1 TO ATTACHMENT A

PROPOSED TECHNICAL SPECIFICATION CHANGES

TO REDUCE TURBINE VALVE TEST FREQUENCY

Table 4.1-3

Frequencies for Equipment Tests

		Check	Frequency	Maximum Time Between Tests
1.	Control Rods	Rod drop times of all control rods	Each refueling shutdown	*
2.	Control Rods	Movement of at least 10 steps in any one direction of all control rods	Every 31 days during reactor critical operations	*
3.	Pressurizer Safety Valves	Setpoint	Each refueling shutdown	*
4.	Main Steam Safety Valves	Setpoint	Each refueling shutdown	*
5.	Containment Isolation System	Automatic Actuation	Each refueling shutdown	*
6.	Refueling System Interlocks	Functioning	Each refueling shutdown prior to refueling operation	Not Applicable
7.	Diesel Fuel Supply	Fuel Inventory	Weekly	10 days
8.	Turbine Steam Stop, Control Valves	Closure	**	**
9.	Cable Tunnel Ventilation Fans	Functioning	Monthly	45 days

* See Specification 1.9.

** The turbine steam stop and control valves shall be tested at a frequency determined by the methodology presented in WCAP-11525 "Probabilistic Evaluation of Reduction in Turbine Valve Test Frequency", and in accordance with established NRC acceptance criteria for the probability of a missile ejection incident at IP-2. In no case shall the test interval for these valves exceed one year.

ENCLOSURE 2 TO ATTACHMENT A

PROPOSED TECHNICAL SPECIFICATION CHANGES

INDEPENDENT TURBINE OVERSPEED PROTECTION SYSTEM

Table 3.5-2

Reactor Trip Instrumentation Limiting Operating Conditions

No.	Functional Unit	1 No. of Channels	2 No. of Channels to Trip	3 Min. Operable Channels	4 Min. Degree of Redundancy	5 Operator Action if Conditions of Column 3 or 4 Cannot be Met
15.	DELETED					
16.	Control Rod Protection****	3	2	2	1	During RCS cooldown, manually open reactor trip breakers prior to T_{cold} decreasing below 350^{o}F. Maintain reactor trip breakers open during RCS cooldown when T_{cold} is less than 350^{o}F.
17.	Turbine Trip $\geq$ 35% F.P. A. Low Auto Stop Oil Pressure	3	2	2	1	Maintain reactor power below 35% F.P.
18.	Reactor Trip Logic	2	1	2#	1#	Be in hot shutdown within the next six hours.

Table 3.5-2

Reactor Trip Instrumentation Limiting Operating Conditions

F.P. = Rated Power

* If two of four power range channels are greater than 10% F.P., channels are not required.

** If one of two intermediate range channels is greater than 10^{-10} amps, channels are not required.

*** 2/4 trips all four reactor coolant pumps.

**** Required only when control rods are positioned in core locations containing LOPAR fuel.

\# A reactor trip breaker and/or associated logic channel may be bypassed for maintenance or surveillance testing for up to eight hours provided the redundant reactor trip breaker and/or associated logic channel is operable.

Table 4.1-1

Minimum Frequencies for Checks, Calibrations and Tests of Instrument Channels

	Channel Description	Check	Calibrate	Test	Remarks
21a.	Containment Sump and Recirculation Sump Level (Discrete)	S	R	R	Discrete Level Indication Systems.
21b.	Containment Sump, Recirculation Sump and Reactor Cavity Level (Continuous)	S	R	R	Continuous Level Indication Systems.
21c.	Reactor Cavity Level Alarm	N.A.	R	R	Level Alarm System
21d.	Containment Sump Discharge Flow	S	R	M	Flow Monitor
21e.	Containment Fan Cooler Condensate Flow	S	R	M*	
22.	Accumulator Level and Pressure	S	R	N.A.	
23.	Steam Line Pressure	S	R	M	
24.	Turbine First Stage Pressure	S	R	M	
25.	Reactor Trip Logic Channel Testing	N.A.	N.A.	M#	
26.	DELETED				

* Monthly visual inspection of condensate weirs only.

ATTACHMENT B

SAFETY ASSESSMENT FOR REDUCTION IN TURBINE VALVE TEST FREQUENCY FOR IP-2

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
AUGUST, 1991

SAFETY ASSESSMENT

The specific proposed changes, set forth in Enclosure 1 to Attachment A to our application, seeks to increase the surveillance intervals for the Turbine Steam Stop and Control Valves operational tests from monthly to yearly consistent with the methodology and results presented in WCAP-11525 "Probabilistic Evaluation of reduction in Turbine Valve Test Frequency" as well as NRC acceptance criteria for the probability of a missile ejection incident at IP-2 (5×10^{-5} per year). As approved by the NRC's Safety Evaluation Report (SER) of February 7, 1989, as supplemented on November 2, 1989, WCAP-11525 has shown that a significant relaxation of turbine valve testing frequency is justified because the probability of generating a turbine missile remains significantly lower than the established NRC acceptance criteria for IP-2, with extended testing intervals.

Currently, turbine valve testing at IP-2 is conducted on a monthly basis. Performing a test of the turbine valves requires reduction in power output which imposes unnecessary transients on plant equipment, and possible consequential reduction in overall plant reliability. Longer valve test intervals will result in improved plant performance, by reducing the potential for transient-related reactor trips, and a reduction in challenges to plant protection systems.

Additionally, the power level reduction is achieved by the addition of boron to the reactor coolant system which must be removed when valve testing is completed. This results in an increase in the amount of radioactive waste generated as well as plant personnel exposure. It should also be noted that transients resulting from power reductions and increases, enhance the possibility of equipment malfunctions and reactor trips.

It is also significant to note that our review of plant test data relative to turbine valve testing have revealed no instance of identified valve failure.

Basis for No Significant Hazards Considerations Determination:

The Commission has provided guidance concerning the application of the standards for determining whether a significant hazards consideration exists by providing examples in 51 Federal Register 7751. This amendment request falls under examples (iv) and (vi) of the Commission's Examples of Amendments That Are Considered Not Likely to Involve a Significant Hazards Consideration (51 FR 7751). Example (iv) relates to the granting of relief from an operating restriction upon demonstration of acceptable means of operation. This assumes that acceptable operating criteria have been established and that it is satisfactorily shown that these criteria have been met. Example (vi) relates to a change that may result in some increase to the probability of a previously-analyzed accident, but where the results of the change are clearly within all transient analysis acceptance criteria.

In applying the standards of 10 CFR 50.92, we have concluded that the proposed Technical Specification changes would not involve a significant hazards consideration because operation of Indian Point Unit No. 2 in accordance with these changes would not:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The NRC has established an annual probability acceptance criteria for turbine missile ejection of less than 5×10^{-5} for an unfavorably oriented turbine such as IP-2. The annual probabilities of an IP-2 turbine missile ejection incident presented in WCAP-11525 range from 5.86×10^{-7} with a turbine valve inspection interval of one month to 1.42×10^{-6} with a turbine valve inspection interval of one year (both intervals occurring during the last quarter of the last year before turbine inspection). This outcome is based on a conservatively assumed 10 year inspection interval for the low pressure rotors. As noted in WCAP-11525, the probability of missile ejection from the IP-2 fully integral rotor design, at design overspeed, is sufficiently low even after 30 years of running time before an inspection. This demonstrates that the probability of a turbine missile ejection accident at the Indian Point 2 plant is well within accepted NRC criteria.

2) Create the possibility of a new or different kind of accident from any previously evaluated:

The proposed amendment reduces the frequency at which turbine valves are tested. As revealed in WCAP-11525, reducing the frequency of turbine valve testing does not result in a significant change in the failure rate, nor does it affect the failure modes for the turbine valves. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3) Involve a significant reduction in margin of safety:

As noted in Response (1) and as shown in WCAP-11525, this change to the Indian Point 2 Technical Specifications will not result in a significant reduction in the margin of safety for turbine missile ejection. The probability of missile ejection remains acceptably small and within guidelines established by the NRC staff.

Conclusions

The foregoing analysis demonstrates that the proposed amendment to the Indian Point 2 Technical Specifications does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of a new or different kind of accident and does not involve a significant reduction in a margin of safety. Therefore, Con Edison concludes that the proposed amendment does not involve a significant hazards consideration.

ATTACHMENT C

SAFETY ASSESSMENT FOR PROPOSED CHANGES
TO INDEPENDENT TURBINE OVERSPEED PROTECTION SYSTEM
TECHNICAL SPECIFICATION

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
AUGUST, 1991

Safety Assessment

This proposed revision to the Indian Point 2 Technical Specification as noted in Enclosure 2 to Attachment A, seeks to eliminate the requirements on the independent turbine electrical overspeed protection system (IEOPS). Presently, Tables 3.5-2 and 4.1-1 provide the limiting conditions for operation (LCOs) and the surveillance requirements for this system, respectively.

Presently, two separate overspeed trip devices are provided on the Indian Point 2 turbine. The mechanical overspeed trip device consists of an eccentric weight mounted on the end of the turbine shaft and balanced in position by a spring until the speed reaches the point at which the trip is set to operate. Centrifugal force causes the weight to fly out and strike the overspeed trip trigger. Movement of the trigger results in a turbine trip and a subsequent reactor trip when the unit load is greater than 35% of full load.

The IEOPS is a redundant turbine overspeed protection system. The IEOPS utilizes the output of magnetic pickups mounted around the turning gear to detect and measure turbine shaft speed. The three speed pickup signals which are proportional to the rotational speed of the turbine are sent to three separate signal conditioners. Each signal conditioner compares the pickup signal with an internal setpoint. If an overspeed condition is sensed by 2/3 of the magnetic pickups or if 2/3 of the signals are lost, the control relays are de-energized, thereby, tripping the turbine.

Therefore, in the case of a turbine overspeed condition, the turbine will be tripped by either the mechanical overspeed trip device or the IEOPS. The IEOPS serves as a redundant system to the mechanical overspeed trip device. The IEOPS also operates in conjunction with the auxiliary governor which is designed to protect against overspeed by being sensitive to turbine acceleration. WCAP-11525 provides a probabilistic analysis which shows that the protective systems provide adequate protection against overspeed without the benefit of IEOPS.

The mean annual probability of missile ejection due to turbine overspeed is given by:

$$P = P(A) * P(M/A) + P(B) * P(M/B) + P(C) * P(M/C)$$

where:

P=	probability of missile ejection due to turbine overspeed
P(A)=	probability of design overspeed
P(M/A)=	conditional probability of missile ejection given the occurrence of a design overspeed event
P(B)=	probability of intermediate overspeed
P(M/B)=	conditional probability of missile ejection given the occurrence of an intermediate overspeed event
P(C)=	probability of destructive overspeed
P(M/C)=	conditional probability of missile ejection given the occurrence of a destructive overspeed event

The following mean overspeed probabilities based on a 12 month turbine valve test interval are obtained from the fault tree quantification performed for the Westinghouse Owners Group (WOG) study on relaxation of the turbine valve test intervals, as noted in WCAP-11525.

$P(A) = 5.00 \times 10^{-1}$
$P(B) = 4.14 \times 10^{-4}$
$P(C) = 8.91 \times 10^{-7}$

As also noted in the WOG study, the probability of missile ejection from IP-2 low pressure fully integral rotors at design overspeed is very small in comparison to other rotor types. This probability was determined to be sufficiently low even after 30 years running time without an inspection. Based on a conservatively assumed 10 year inspection period for these rotors at the end of the last year of operation of the rotor before its schedule inspection, the conditional missile ejection probabilities are:

$P(M/A) = 1.05 \times 10^{-6}$
$P(M/B) = 5.25 \times 10^{-6}$
$P(M/C) = 1.0$

Based on these values, the total probability of missile ejection due to turbine overspeed and running speed during the last quarter of the last year prior to inspection is 1.42×10^{-6} which is below the acceptance criteria of 5×10^{-5} per year. This result is achieved without the benefit of an additional or redundant overspeed protection system as documented in WCAP-11525.

As a result of the fault tree modeling and quantification documented in WCAP-11525 the dominant faults which contribute to the missile ejection probability were identified to be the turbine control valves sticking open. For the case of intermediate overspeed, common cause failures of the low pressure dump valves and the failure of the stop valve bypass valves to close were also dominant faults. In all cases, valve failures dominate the missile ejection probabilities. The IEOPS does not significantly reduce the probability of overspeed. The probability of missile generation at overspeed conditions is sufficiently low that the elimination of the IEOPS will not result in a violation of the NRC 5 x 10^{-5} per year missile ejection acceptance criteria for Indian Point No. 2.

Basis for No Significant Hazards Considerations Determination

In applying the standard of 10 CFR 50.92, we concluded that the proposed Technical Specification changes would not involve a significant hazards considerations because operation of Indian Point Unit No. 2 in accordance with these changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The results of the WCAP-11525 evaluation demonstrate that the probability of missile generation due to overspeed is dominated by valve-related failures and that the probability of missile generation due to overspeed is well within the acceptance criteria for this event. These conclusions are made without taking any credit for IEOPS. In addition, the study demonstrates that the impact of IEOPS on reducing the probability of turbine missiles due to overspeed is minor at best. As such, this proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

   This application seeks to delete the LCOs and surveillance requirements applicable to IEOPS. The IEOPS serves as a backup turbine overspeed trip device. The elimination of the IEOPS will not vary or affect any plant or turbine operating condition or parameter. As such, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Involve a significant reduction in a margin of safety.

The total probability of missile ejection due to turbine overspeed and running speed is 1.14×10^{-6}/year which is below the acceptance criteria of 5×10^{-5}/year The fault tree modeling and quantification demonstrated that IEOPS has only a minor impact in reducing the probability of overspeed. The probability of missile generation at overspeed conditions is sufficiently low that the elimination of the IEOPS will not result in a violation of the 5×10^{-5} per year missile ejection acceptance criteria. As such, this proposed change does not involve a significant reduction in a margin of safety.

Conclusion

The foregoing analysis demonstrates that the proposed amendment to the Indian Point 2 Technical Specifications does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of a new or different kind of accident, and does not involve a reduction in a margin of safety as defined in the basis for Technical Specification. Therefore, Con Edison concludes that the proposed Technical Specification does not involve a significant hazards evaluation.

ATTACHMENT D

EVALUATION OF 133% DESIGN OVERSPEED CONDITION

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
August, 1991

In the plant specific analysis of the probability of turbine missile ejection at IP-2 documented in WCAP-11525 the design overspeed for the IP-2 turbine was reflected as 132% rather than our design basis value of 133%. The following is an evaluation of this difference and its impact on the conclusions reflected in WCAP-11525.

When the analysis for WCAP-11525 was performed, Westinghouse estimated the conditional missile ejection probabilities for IP-2 fully-integral rotors by comparing and extrapolating the conditional probability data they had on hand for heavy disc keyplate and partially-integral rotors. Subsequently they reviewed the report WSTG-4-P "Analysis for the Probability of the Generation of Missiles from Fully Integral Nuclear Low Pressure Rotors" (Submitted to the NRC in October 1984) which gave the actual calculated probabilities of missile ejection for fully integral rotors at design overspeeds of 120% and 132%. Comparison of the actual conditional probabilities for 132% overspeed with the previous estimated values results in good agreement. Since the estimated values were slightly greater than the actual calculated values in WSTG-4-P, they did not revise the analysis for WCAP-11525.

The following compares the estimated design overspeed conditional probabilities of missile ejection, as used in WCAP-11525, Table 8.2-3 with the conditional probabilities obtained by transforming and plotting the conditional probability data from WSTG-4-P:

WCAP-11525		WSTG-4-P		Percent Difference From WSTG-4-P	
Case 1 P(M/A)	Case 2 P(M/A)	Case 1 P(M/A)	Case 2 P(M/A)	Case 1	Case 2
5.0E-07	1.05E-06	4.6E-07	9.2E-07	+9%	+14%

The comparison of data indicates that WCAP-11525 used values of P(M/A) that were 9% and 14% more conservative than the calculated values in WSTG-4-P. The values of P(M/B) (conditional probability of missile ejection given intermediate overspeed) used in WCAP-11525 are likewise somewhat conservative. If one were to consider design overspeed of 133%, which represents an overspeed increase of 1%, the results in WCAP-11525 would still be valid due to the conservative and bounding conditional probabilities used in the analysis.