GE Nuclear Energy

General Electric Company
175 Curtner Avenue, San Jose, CA 95125

April 1, 1993

Docket No. STN 52-001

Chet Poslusny, Senior Project Manager
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of the Nuclear Reactor Regulation

Subject: Submittal Supporting Accelerated ABWR Review Schedule - **Turbine In-Service Test and Inspection**

Dear Chet:

Enclosed is a proposed SSAR markup which addresses the currently evolving BWROG turbine surveillance test program. This approach is similar to that accepted for the Reactor Vessel Level Instrumentation BWROG in Table 1.8-22 (Page 1.8-70.1).

Please provide a copy of this transmittal to George Georgiev.

Sincerely,

Jack Fox

Jack Fox
Advanced Reactor Programs

cc: Jim Black (GE)
Norman Fletcher (DOE)
Bernie Genetti (GE)

See attached distribution

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(1) Visual examination of all accessible surfaces of rotors

(2) Visual and surface examination of all low-pressure buckets

(3) 100-percent visual examination of couplings and coupling bolts

The inservice inspection of valves important to overspeed protection includes the following:

(1) All main stop valves, control valves, extraction nonreturn valves, and CBIVs will be tested under load. Test controls installed on the main control room turbine panel and permit full stroking of the stop valve, control valves, and CBIVs. Valve position indication is provided on the panel. No load reduction is necessary before testing main stop and control valves, and CBIVs. Extraction nonreturn valves are tested by equalizing air pressure across the air cylinder. Movement of the valve arm is observed upon action of the spring closure mechanism.

(2) Main stop valves, control valves, extraction nonreturn valves, and CBIVs will be tested at least once a week by closing each valve and observing by the valve position indicator that it moves smoothly to a fully closed position. At least once per month closure of each main stop valve, control valve and CBIV during test will be verified by direct observation of the valve motion.

Tightness tests of the main stop and control valves are performed at least once per maintenance cycle by checking the coastdown characteristics of the turbine from no load with each set of four valves closed alternately.

(3) All main stop valves, main control valves, and CBIVs will be inspected once during the first three refueling or extended maintenance shutdowns. Subsequent inspections will be scheduled so that each valve is inspected at 3 to 5 year interval and at least, one valve of each type is inspected after each fuel cycle or 3 1/3 year interval, whichever is less. The inspections will be conducted for:

(a) Wear of linkages and stem packings

(b) Erosion of valve seats and stems

(c) Deposits on stems and other valve parts which could interfere with valve operation

(d) Distortions, misalignment

Inspection of all valves of one type will be conducted if any unusual condition is discovered

10.2.4 Evaluation

The turbine-generator is not nuclear safety related and is not needed to effect or support a safe shutdown of the reactor.

The turbine is designed, constructed, and inspected to minimize the possibility of any major component failure.

The turbine has a redundant, testable overspeed trip system to minimize the possibility of a turbine overspeed event.

Unrestrained stored energy in the extraction steam system has been reduced to an acceptable minimum by the addition of nonreturn valves in selected extraction lines.

The turbine-generator equipment shielding requirements and the methods of access control for all areas of the turbine building ensure that the dose criteria specified in 10CFR20 for operating personnel are not exceeded.

All areas in proximity to turbine generator equipment are zoned according to expected occupancy times and radiation levels anticipated under normal operating conditions.

Specification of the various radiation zones in accordance with expected occupancy is listed in Chapter 12.

If deemed necessary during unusual occurrences, the occupancy times for certain areas will be reduced by administrative controls enacted by health physics personnel.

The design basis operating concentrations of N-16 in the turbine cycle are indicated in Section 12.2.

The connection between the low-pressure turbine exhaust hood and the condenser is made by means of a stainless steel expansion joint.

INSERT 10.2.3.6

INSERT 10.2.3.6
by the COL applicant in accordance with the BWROG turbine surveillance test program.

Since there is no nuclear safety related mechanical equipment in the turbine area and since the condenser is at subatmospheric pressure during all modes of turbine operation, failure of the joint will have no adverse effects on nuclear safety related equipment.

10.2.5 COL License Information

10.2.5.1 Low Pressure Turbine Disk Fracture Toughness

The COL applicant will provide turbine material property data and assure sufficient turbine warmup time as required by Subsection 10.2.3.2.

10.2.5.2 Turbine Design Overspeed

The COL applicant will provide the basis for the turbine overspeed as required by Subsection 10.2.3.4(4).

10.2.5.3 Turbine Inservice Test and Inspection

The COL Applicant will provide the turbine inservice test and inspection requirements noted in Subsection 10.2.3.6

10.2.6 References

1. J.A. Begley and W.A. Logsdon, Westinghouse Scientific Paper 71-1E7 MSLRF-P1.

2. ASTM Section III, Vol 03.01, E139-83 *Standard Practice for Conducting Creep, Creep Rupture and Stress Rupture Tests fo Metallic Materials.*