



Westinghouse  
Electric Corporation

Power Generation  
Group

Steam Turbine-Generator Divisions

Lester Branch Box 9175  
Philadelphia Pennsylvania 19113

September 8, 1982

Mr. John O. Schiffgens  
Materials Engineering Branch  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Schiffgens:

In response to W. V. Johnston's letter of August 3, 1982 to me, we are providing the following information:

Request (g) i, Page 3

A copy of Table 3-1, "Basic Fault Tree Events" is enclosed. This is for use with Table 3-2 which is being sent under separate cover since Table 3-2 (2 sheets) is proprietary and Table 3-1 is not.

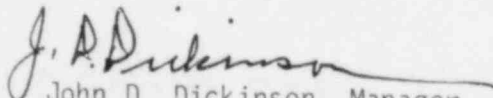
Request (g) ii, Page 3

We plan to update the 1974 report, including inspection and testing interval effects to the extent that they can be sorted out, in the first quarter of 1983.

Request (g) iii, Page 3

Overspeed system testing recommendations are contained in CT-24001, Revision 1, 12/74. Inspection intervals for throttle, governor, interceptor, and reheat stop valves are contained in CT-24038, Revision 0, September 1982. The Revision 0 on your copy means it is the first issue in our Steam Turbine Information Manual not the first time it was issued.

Sincerely,

  
John D. Dickinson, Manager  
Engineering Information

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TABLE 3-1

## BASIC FAULT TREE EVENTS

Event Number	Event Description	Example of Location in Destructive Overspeed Fault Tree (may not be unique)
1	Emergency trip weight failure	11 222 111 222
2	Cup valve failure	11 222 111 221
3	Solenoid (20/AST) failure	11 222 111 213
4	20/AST actuation train failure	11 222 111 212
5	Speed detector failure	M
6	Interface valve failure	11 222 111 122
7	Interface ETF drain clogged	11 222 111 121
8	Solenoid (20/ET) failure	11 222 111 113
9	Pressure switch failure	11 222 111 112
10	Primary ETF drain clogged	P
11	Dump valve stuck	112 121 222
12	Actuator fluid clogged	112 121 221
13	Auto stop oil clogged	112 221 113
14	ETF clogged from dump valves	B,H
15	Auxiliary protection malfunction	A
16	Throttle valve stuck	112 212
17	Servo (Moog) valve failure	112 121 113
18	Servo circuitry failure	112 121 111
19	Governor valve stuck	112 122
20	Check valve failure	111 111 211
21	Loss of load detection failure	1 111 111 112 321
22	OPC or ET speed detection failure	111 111 111 231, F
23	OPC actuation train failure	11 111 111 122
24	OPC solenoid (20/ET) pair failure	11 111 111 121
25	Interceptor valve stuck	1 121 322 *

\* Design Overspeed Fault Tree

**FUNCTIONAL TESTING REQUIREMENTS  
FOR NUCLEAR TURBINES**

- I. Once Each Week (A complete check of valve stem freedom)
  - A. Throttle Valves
  - B. Governor Valves
  - C. Reheat Stop Valves
  - D. Interceptor Valves
  - ① E. Extraction Nonreturn Valve
- II. Once Each Month
  - A. Overspeed Trip - Oil Trip Test
  - B. Low Vacuum Trip
  - C. Low Bearing Oil Trip
  - D. Thrust Bearing Trip
  - E. Electrical Overspeed Trip
  - F. Low EH Fluid Trip
- III. Once Every Six Months
  - A. Overspeed Emergency Trip by Overspeeding the Unit
  - B. Remote Trip
  - C. Initial Pressure Regulator
  - D. Auxiliary Governor (Overspeed Protection Controller)
- IV. Once Each Startup
  - Check the overspeed protection controller once each startup at any speed up to rated speed.
  - Check visually to be sure governor and interceptor valves close.

① Revision 1. This line was II G.

VALVE INSPECTION FOR FOSSIL AND NUCLEAR UNITS

Westinghouse recommends the following schedule:

All throttle, governor, reheat stop and interceptor valves should be inspected 12 to 15 operating months after the initial start of the unit. Westinghouse recommends this inspection since experience shows that potential difficulties with these valves often become visible during this period.

Following this initial inspection, Westinghouse recommends a schedule of valve inspection for throttle, governor, reheat stop, and interceptor valves at 15, 27, and 39 operating months after the initial inspection. In this program some valves are inspected 12-15 months, other 24-27 months, and the remainder 36-39 months so that all valves are inspected at least once in the 39 months of operation following the initial inspection of the valves.

Subsequent inspections of these valves should be in accordance with the above schedule so that all valves are inspected once every 39 operating months.

If any valve is found to have a problem when it is inspected, then all valves of that type (TV or GV, etc.) should be inspected immediately.

Where in the course of an inspection there is access to other valves, then these valves should be given at least a visual inspection. For example, the removal of throttle valves will give visual access to some governor valves.

Should a malfunction of any of these valves occur during operation, corrective action must be taken immediately if overspeed protection, equipment safety, or control of the unit is affected. Also inspect all valves of that same type (TV or GV, etc.) immediately for indications that the same distress may exist. Should there be indications corrective action must be taken immediately.