INSTRUMENTATION

3/4.3.4 TURBINE OVERSPEED PROTECTION

LIMITING CONDITION FOR OPERATION

3.3.4 At least one Turbine Overspeed Protection System shall be OPERABLE.

APPICABILITY: MODE 1.

ACTION:

a. With one stop valve or one governor valve per high pressure turbine steam lead inoperable and/or with one reheat stop valve or one reheat intercept valve per low pressure turbine steam lead inoperable, restore the inoperable valve(s) to OPERABLE status within 72 hours, or close at least one valve in the affected steam lead(s) or isolate the turbine from the steam supply within the next 6 hours.

b. With the above required Turbine Overspeed Protection System otherwise inoperable, within 6 hours isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENTS

4.3.4.1 The provisions of Specification 4.0.4 are not applicable.

4.3.4.2 To assure operability of the above required Turbine Overspeed Protection System, an inservice inspection of the various components of this system are carried out in accordance with the "Turbine Overspeed Reliability Assurance Program."

3/4.3.3.10 LOOSE-PART DETECTION INSTRUMENTATION

The OPERABILITY of the loose-part detection instrumentation ensures that sufficient capability is available to detect loose metallic parts in the reactor system and avoid or mitigate damage to reactor system components. The allowable out-of-service times and Surveillance Requirements are consistent with the recommendations of Regulatory Guide 1.133, "Loose-Part Detection Program for the Primary System of Light-Water-Cooled Reactors," May 1981.

3/4.3.4 TURBINE OVERSPEED PROTECTION

This specification is provided to ensure that the turbine overspeed protection instrumentation and the turbine speed control valves are OPERABLE and will protect the turbine from excessive overspeed. Protection from turbine excessive overspeed is required since excessive overspeed of the turbine could generate potentially damaging missiles. All Catagory I structures except the new fuel vault at McGuire, are designed to withstand effects of turbine missles without any adverse impact on the safety related equipment housed inside (FSAR Section 3.5.2.7 and 10.2.3). To assure protection against turbine overspeed a "Turbine Overspeed Reliability Program" is implemented. Tests and inspections associated with this program will be performed in accordance with station procedures, maintenance work requests and/or outage work schedules as appropriate. All deviations from the program or deficiencies identified through the specified maintenance, calibration or testing activities are evaluated by Duke Power company to determine if operability of the system has been affected and appropriate action taken such as correcting the deviation or deficiency, performing compensatory action, or removing the turbine from service.

Attachment II

JUSTIFICATION AND SAFETY ANALYSIS

The proposed change to the McGuire Nuclear Station Technical Specifications seeks to delete turbine valve testing requirements (Technical Specification 4.3.4.2). The Surveillance and testing requirements in Technical Specifications 4.3.4.2 have become unnecessary after implementation of the "Turbine Overspeed Reliability Program" at the McGuire Nuclear Station.

The McGuire Nuclear Station Turbine Overspeed Reliability Assurance Program is a comprehensive program for maintenance, calibration and testing of the Turbine Overspeed Protection System. This program is based upon actual operating experience at McGuire Nuclear Station. A description of the Turbine Overspeed Reliability Assurance Program is included as an appendix to this section.

The turbine valve maintenance program includes inspection and maintenance of all throttle and governor valves and all reheat stop and intercept valves at least every 40 months. These maintenance intervals are substantially more frequent than the current Technical Specification requirement to inspect one of each type of valve at least every 40 months.

The calibration program addresses the turbine overspeed protection system instrumentation. Calibration is performed during each refueling outage or following major maintenance on the turbine/generator or the overspeed protection system.

The testing program addresses the turbine valves and the turbine overspeed protection system. Testing is performed during each turbine startup, unless tested within the previous seven (7) days, including startup after each refueling outage. The testing program includes a complete test of all turbine valves on an approximate interval of four (4) months. Also, the turbine is subjected to an actual overspeed trip test every refueling outage or following major maintenance on the turbine.

The Turbine Overspeed Reliability Assurance Program is a subject of ongoing review and evaluation so that some changes in scope/schedule may occur as appropriate. However, the objective of maintaining the high reliability of the turbine overspeed protection system will be met. The Turbine Overspeed Reliability Assurance Program and any subsequent changes will be reviewed and approved in accordance with existing plant administrative procedures.

The Turbine Overspeed Reliability Assurance Program has been reviewed by Westinghouse and the NRC for a similar program which is in effect at Farley Nuclear Station. Implementation of a "Turbine Overspeed Reliability Assurance Program" in lieu of existing testing requirements (Technical Specification 4.3.4.2) has been deemed acceptable by the NRC for Farley

Nuclear Station. A Duke Power study has shown that McGuire Nuclear Station has the same or very similar equipment in the Turbine Overspeed Protection System as Farley. Although Westinghouse has not researched this specific reliability assurance program for McGuire, Duke Power has applied the program to McGuire to improve the Turbine Overspeed Protection Program. As indicated in Appendix I, Duke Power has deviated from certain test performance periods which Westinghouse recommended for Farley. These deviations have been deemed appropriate for McGuire based on actual positive test results which indicate that the testing frequency does not need to be increased.

Duke Power Company has implemented a comprehensive and a vigorous program for assuring reliability of the turbine overspeed protection system. Duke Power Company contends that existing requirements for testing turbine valves (Technical Specification 4.3.4.2) are no longer necessary. The orientation of the turbine and the fact that catagory I structures, as described in the FSAR (Section 3.5.2.7 and 10.2.3) are designed to withstand turbine missles and provide additional assurance that the safety related structures and components will not be affected in the extremely unlikely event that a turbine missle is generated. The proposed amendment would not have an adverse safety impact.

W. B. McGuire Nuclear Station

Turbine Overspeed Reliability Assurance Program

Appendix I

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1.0 Introduction and Summary

The Duke Power Company "Turbine Overspeed Reliability Assurance Program" includes a comprehensive program of maintenance, calibration and testing of the turbine overspeed protection system. This program is based on recommendations by Westinghouse regarding valve maintenance and on operating experience at the McGuire Nuclear Station. Through the use of this program Duke Power Company will deviate from the Westinghouse recommended testing intervals for the Mechanical Overspeed trip device test, Turbine Overspeed and Protection Device Testing and the Turbine Valve testing. The overall objective of this program is to maintain the high reliability of the turbine overspeed protection system.

The maintenance program is discussed in Section 2.0 and includes inspection and maintenance of the throttle, governor, reheat stop and intercept valves. The schedule and scope of the inspection and maintenance is in accordance with Westinghouse recommendations.

The calibration program is discussed in Section 3.0 and includes calibration of the turbine overspeed protection system. Calibration is performed during each refueling outage or following major maintenance on the turbine generator or the overspeed protection system.

The testing program is discussed in Section 4.0 and includes testing of the turbine valves and the turbine overspeed protection system. Testing is performed during each turbine startup, unless tested within the previous seven (7) days, including startup after each refueling outage. The testing program includes a complete test of all turbine valves on an approximate interval of four (4) months unless plant operating conditions necessitate an extension to this interval.

The governor, throttle, intercept, and reheat stop valves are included in the Nuclear Maintenance Data Base in order that deficiencies may be reported and reviewed and appropriate changes may be made in the McGuire Nuclear Station program based on reliability information (Section 5.0).

This comprehensive program is the subject of on-going review and evaluation. The schedules and/or scope of the maintenance, calibration and testing are subject to revision as appropriate based on operating experience or changes to the manufacturer's recommendations. The program will be performed in accordance with procedures, maintenance work requests and/or outage work schedules as appropriate. This program and any subsequent changes will be reviewed and approved as specified in existing plant administrative procedures. All deviations from the program and deficiencies identified through the specified maintenance, calibration or testing activities will be evaluated by Duke Power Company to determine appropriate action to be taken such as correcting the deviation or deficiency, performing compensatory action or removing the turbine from service.

2.0 Maintenance Program

The maintenance program includes inspection and maintenance of the governor, throttle, intercept and reheat stop valves. All turbine valves are inspected at least every 40 months.

Figure 1 shows the schedule for inspection of each of the valves over the next 10 years. This schedule will be adjusted as necessary based on inspection results during each refueling outage; however, each valve will be inspected within the 40 month period.

The scope of the inspections and maintenance is discussed below.

2.1 Governor Valve Program

The inspection of the governor valves includes removing the valve and bonnet assembly, disassembly of the valve, cleaning the valve components, dust blast and NDE of vital valve components, and repair and replacement of components as required. This inspection is performed on each governor vale at least every 40 months. The projected schedule for inspection is shown in Figure 1.

2.2 Throttle Valve Program

The inspection of the throttle valves includes removing the valve assembly, disassembly of the actuator and linkage, removal of the valve bonnet and valve assembly, removal of the valve and stem from the valve bonnet, dust blast and NDE of components, repair and replacement of components as-required, recording of vital clearances as-found and as-left, and checking seat pins for integrity and condition of peening. This inspection is performed on each throttle valve at least every 40 months. The projected schedule for inspection is shown in Figure 1.

2.3 Intercept and Reheat Stop Valves Program

The inspection of the intercept and reheat stop valves includes removing the valve assembly, disassembly of the spring housing and actuator, disassembly of the valves, removal of the seal assembly, and inspection and repair of parts as necessary. This inspection is performed on each intercept and reheat stop valve at least every 40 months. The projected schedule for inspection is shown in Figure 1.

3.0 Calibration Program

The turbine electric and mechanical overspeed trip calibration tests are performed at each refueling outage in conjunction with the turbine overspeed and protection device testing described in section 4.2.

The scope of the calibration testing is discussed below.

3.1 Electrical Overspeed Trip Calibration

The electrical overspeed trip test is designed to verify calibration of the digital speed indicator on the turbine, the trip value (111%) on the turbine overspeed trip channel, and the gap clearance on the speed pickup device. The as-found values are recorded and compared to expected values. If any as-found values are out of tolerance, the equipment is adjusted and the testing is repeated. This testing assures proper calibration of the electrical overspeed trip devices.

3.2 Mechanical Overspeed Trip Calibration

The mechanical overspeed trip test is designed to verify calibration of the turbine mechanical overspeed trip system. The turbine is manually controlled up to 110% of rated speed to observe an actual overspeed trip and the value at which the turbine trip occurs is recorded. If the as-found trip value is out of tolerance, the trip setpoint is adjusted and the test is then repeated. This testing assures proper calibration of the mechanical overspeed trip devices.

4.0 Testing Program

The testing program includes testing the turbine valves and the turbine overspeed protection system. Testing is performed during each turbine startup, unless tested within the previous 7 days, including startup after each refueling outage. This program also includes a test of all the turbine valves on an approximate interval of four (4) months.

The scope of the testing is discussed below.

4.1 Turbine Generator Startup Testing

The turbine generator startup testing is performed during each startup unless performed within the previous seven (7) days. This testing includes:

a. Manual Trip Test

The turbine is manually tripped from rated speed using the Main Turbine Emergency Trip Switch on the Main Control Board or by use of the hand trip device on the Governor End Pedestal. Proper operation of the trip system and the turbine valves is verified.

b. Mechanical Overspeed Trip Device Test*

The appropriate oil pressure is applied to the mechanical overspeed device to verify that the mechanical device functions properly. The turbine is at rated speed when this test is performed. The trip signal causes the overspeed trip valve to open but the trip oil is blocked such that the turbine does not actually trip.

c. Overspeed Protection Control (OPC) Test

The OPC (103% turbine overspeed protection feature) is tested to ensure proper operation. The OPC key switch is turned to the test position to verify that turbine governor and intercept valves close.

4.2 Turbine Overspeed and Protection Device Testing**

The turbine overspeed trip system functional test is performed each refueling outage or when major maintenance is performed on the turbine. This test involves manually controlling turbine speed up to 110% of rated speed to observe an actual overspeed trip on the turbine.

* Westinghouse recommends that this test be performed monthly.

** Westinghouse recommends that this test be performed every six (6) months.

4.3 Shutdown Turbine Trip Verification

The shutdown turbine trip verification is performed during each planned shutdown of the unit. This test required an Operator to verify by observation that the turbine valves actually close during each planned shutdown. This test also requires the Plant Operator to verify that the turbine valve positions are properly indicated on the monitor light boxes immediately after each shutdown.

4.4 Turbine Valve Test***

The turbine valves test is performed on all turbine valves on an approximate interval of four (4) months. This test requires each of the turbine valves to be cycled to demonstrate free operation as the valves close and reopen. This test is run from the Main Control Room with an Operator verifying valve operation by direct observation.

*** Westinghouse recommends that this test be performed monthly.

5.0 Nuclear Maintenance Data Base Applicability

Duke Power Company has a Nuclear Maintenance Data Base (NMDB) to schedule and track maintenance on installed system and components. The NMDB also provides maintenance histories for systems and components. Selected PM and Technical Specification reports are printed from the NMDB to evaluate the status of our Maintenance activities. The "Turbine Overspeed Reliability Assurance Program" will use the NMDB to monitor the effectiveness of its program. Maintenance histories will provide corrective feedback to evaluate potential enhancements to this program.

6.0 Conclusion

The "Turbine Overspeed Reliability assurance Program" provides a mechanism to maintain the high reliability of the McGuire Nuclear Station turbine overspeed protection system. This program is based on recommendations by Westinghouse regarding valve maintenance and on actual operating experience at the McGuire Nuclear Station. This comprehensive program is the subject of on-going review and evaluation such that changes in scope and schedule may occur as appropriate; however, the objective of maintaining the high reliability of the turbine overspeed protection system will be met. This program and any subsequent changes will be reviewed and approved as specified maintenance, calibration or testing activities will be evaluated by Duke Power Company to determine if operability of the system has been affected and appropriate action taken such as correcting the deviation or deficiency, performing compensatory action or removing the turbine from service.

Figure 1

UNIT	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Refueling	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
HP Turbine			x			x			x			x			x			x		
LP1 Turbine	x		I			x			x		x	I			x			x		
LP2 Turbine	x		I				x			x	x	I				x			x	
LP3 Turbine	x		I				x			x	x	I				x			x	
#1 Throttle Valve		x			x			x			x			x			x			x
#2 Throttle Valve	x	x			x			x			x			x			x			x
#3 Throttle Valve		x			x			x			x			x			x			x
#4 Throttle Valve		x			x			x			x			x			x			x
#1 Governor Valve			x			x			x			x			x			x		
#2 Governor Valve			x			x			x			x			x			x		
#3 Governor Valve			x			x			x			x			x			x		
#4 Governor Valve	x		x			x			x		x			x			x			x
#1 Reheat Stop Valve	x		x				x			x		x			x			x		
#2 Reheat Stop Valve	x			x			x			x		x			x			x		
#3 Reheat Stop Valve	x			x			x			x			x			x			x	
#4 Reheat Stop Valve	x			x			x			x			x			x			x	
#5 Reheat Stop Valve			x			x			x		x			x			x			x
#6 Reheat Stop Valve			x			x			x			x			x			x		
#1 Intercept Valve	x			x			x			x		x			x			x		
#2 Intercept Valve			x			x			x				x			x			x	
#3 Intercept Valve	x			x			x			x	x			x			x			x
#4 Intercept Valve			x			x			x				x			x			x	
#5 Intercept Valve			x			x				x		x			x			x		
#6 Intercept Valve			x			x				x		x			x			x		
MSR	x	R	x	x	x	x	x	x	x	x	R	x	x	x	x	x	x	x	x	x
A Feed Pump Turbine		x				x				x	x				x				x	
B Feed Pump Turbine		x				x				x			x					x		

KEY:

x = Routine Outage Inspection
I = Replacement with monoblock rotor
R = MSR upgrade 439 SS bundles

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Attachment III

ANALYSIS OF SIGNIFICANT HAZARDS CONSIDERATION

As required by 10CFR50.91 this analysis provides a determination that the proposed changes to the Technical Specifications do not involve any significant hazards consideration as defined by 10CFR50.92

The proposed amendment would add a reference to the "Turbine Overspeed Reliability Program" in the basis for Technical Specification 4.3.4.2. This change constitutes an additional limitation or restriction not presently included in the Technical Specifications and therefore does not involve any significant hazards consideration. The proposed change to delete Surveillance requirement 4.3.4.2 and implement a "Turbine Overspeed Reliability Program" will not involve any significant hazards consideration. This change may result in a small increase of probability of a previously analysed accident (generation of turbine missles), however, the consequences of the change are well within the acceptance criteria specified in the Standard Review Plan. All catagory I structures at McGuire are designed to withstand the effects of turbine-generator missles without affecting the safety related equipment. The potential insignificant increase of probability of catastrophric turbine failure would not have any adverse impact on the power plant safety or safety related equipment.

The proposed amendment would not:

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

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

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

Based upon the preceding analysis Duke Power Company concludes that the proposed amendments do not involve a significant hazards consideration.