Duke Energy

REGIS T. REPKO
Vice President
McGuire Nuclear Station

Duke Energy
MG01VP / 12700 Hagers Ferry Rd.
Huntersville, NC 28078

980-875-4111
980-875-4809 fax
regis.repko@duke-energy.com

December 5, 2011

10 CFR 50.90

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station, Units 1 and 2
Docket Numbers 50-369 and 50-370

License Amendment Request for Changes to Technical Specification Table 3.3.1-1, Reactor Trip System Instrumentation, Function 16(e)

Pursuant to 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke Energy) herein submits a license amendment request (LAR) for the Renewed Facility Operating License (FOL) and Technical Specifications (TS) for McGuire Nuclear Station Units 1 and 2 to allow changes to TS 3.3.1, Reactor Trip System (RTS) Instrumentation, Table 3.3.1-1, Function 16(e), "Turbine Impulse Pressure, P-13". Duke Energy proposes a TS change to replace the phrase "Turbine Impulse Pressure" with "Turbine Inlet Pressure." The requested change results in a generic P-13 requirement, without specifying a particular turbine blade design. This terminology change allows flexibility for planned high pressure turbine replacements.

The proposed change does not involve any physical or design change to the P-13 function, will have no effect on the operation of the Reactor Trip System, and retains the required P-13 safety function.

Attachment 1 provides a description of the proposed changes, the technical evaluation, the determination that the proposed amendment contains No Significant Hazards Consideration and the basis for the categorical exclusion from performing an Environmental Assessment/Impact Statement pursuant to 10 CFR 51.22(c)(9).

Attachment 2 contains a marked-up version of the affected TS. A reprinted (clean) TS page will be provided to the NRC prior to issuance of the approved amendment. Proposed changes to the associated Bases are provided as Attachment 3 for information.

There are no regulatory commitments contained in this amendment request.
Duke Energy requests NRC approval of the proposed change by August 3, 2012 in order to support the scheduled replacement of the Unit 2 high pressure turbine during the Unit 2 Fall

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2012 refueling outage. The scheduled replacement of the Unit 1 high pressure turbine will occur during the Unit 1 Spring 2013 refueling outage.

Implementation of the approved amendment will require changes to the McGuire Updated Final Safety Analysis Report (UFSAR). Revisions to the UFSAR will be made in accordance with 10 CFR 50.71(e).

Duke Energy is requesting a standard 30-day implementation period in conjunction with this amendment.

In accordance with Duke Energy administrative procedures and the Quality Assurance Program Topical Report, this proposed amendment has been reviewed and approved by the McGuire Plant Operations Review Committee.

Pursuant to 10 CFR 50.91, a copy of this proposed amendment is being sent to the designated official of the State of North Carolina.

If you have any questions or require additional information, please contact K. L. Ashe at (980) 875-4535.

Very truly yours,

R. T. Repko
Attachments

xc (with attachments):

V. M. McCree
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, GA 30303-1257

J. Zeiler
NRC Senior Resident Inspector
McGuire Nuclear Station

J. H. Thompson (addressee only)
NRC Senior Project Manager (McGuire)
U.S. Nuclear Regulatory Commission
Mail Stop O-8 G9A
Washington, DC 20555-0001

W. L. Cox III, Section Chief
North Carolina Department of Environment and Natural Resources
Division of Environmental Health
Radiation Protection Section
1645 Mail Service Center
Raleigh, NC 27699-1645

Regis T. Repko affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

Regis T. Repko, Vice President, McGuire Nuclear Station

Subscribed and sworn to me: December 5, 2011
Date

Lori C. Gibby, Notary Public

My commission expires: July 1, 2012
Date

SEAL

ATTACHMENT 1

LICENSE AMENDMENT REQUEST FOR CHANGES TO TECHNICAL SPECIFICATION TABLE 3.3.1-1, REACTOR TRIP SYSTEM INSTRUMENTATION, FUNCTION 16(e)

Evaluation of the Proposed Changes

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke Energy) herein submits a license amendment request (LAR) for the Renewed Facility Operating License (FOL) and Technical Specifications (TS) for McGuire Nuclear Station Units 1 and 2 to revise TS 3.3.1, Reactor Trip System (RTS) Instrumentation, Table 3.3.1-1, Function 16(e) by replacing the phrase "Turbine Impulse Pressure" with "Turbine Inlet Pressure." The proposed change results in a generic statement of the P-13 requirement, without specifying a particular turbine blade design. The requested terminology change allows flexibility for future replacement of the McGuire high pressure (HP) turbines. The Unit 2 high pressure turbine will be replaced during the Unit 2 outage, currently scheduled for the Fall of 2012. The replacement of the Unit 1 high pressure turbine will occur during the Unit 1 refueling outage, currently scheduled for the Spring of 2013.

2.0 DETAILED DESCRIPTION

The proposed change revises Technical Specification section 3.3.1, Table 3.3.1-1, Function 16(e) for permissive interlock P-13. The phrase "Turbine Impulse Pressure" will be replaced with "Turbine Inlet Pressure."

The requirement for turbine pressure input in the P-13 RTS interlock is that the P-13 signal be representative of the rated thermal power. This is accomplished by measuring the high pressure turbine first stage shell pressure because this pressure exhibits a consistent and accurate relationship with rated thermal power. The term "impulse" refers to a particular type of turbine blade design. Duke Energy is planning to replace its existing high pressure turbine nozzle controlled partial arc design with a new throttle controlled full arc design. The proposed change results in a generic statement of the P-13 requirement, without specifying a particular turbine blade design.

The proposed change does not involve any physical or design change to the P-13 function, and will have no effect on the operation of the RTS. No changes are being proposed for the specific parameter values associated with the P-13 criteria (i.e., applicable modes, number of channels required to be operable, channels to trip, conditions, allowable value and nominal trip setpoint).

3.0 TECHNICAL EVALUATION

In support of the turbine upgrade for Units 1 and 2, the rotor, inner casing, guide blade carriers, gland seal segments and blading will be replaced. The HP turbines currently feature a double-flow blade path with an impulse stage and seven (7) reaction type blade stages on each side. The impulse pressure is sensed downstream of the first row and fed into plant instrumentation and control (I&C) systems. The new design eliminates the nozzle block and impulse stage.

The turbine redesign moves the pressure sensing taps for instrument loops PT505/506 to just upstream of the inlet steam admission ring, but downstream of the turbine governor valves. The current PT505/506 locations are shown in enclosed Figure 1. The new locations for the transmitters are shown in Figure 2. Both existing and new pressure tap locations are functionally equivalent for their respective turbine designs in that they both

measure the inlet pressure to the first full-arc stage which can be used as an indirect reactor power pressure equivalent.

The physical changes to the Unit 1 and Unit 2 turbines and the associated relocation of the pressure taps will be performed under the engineering change process, following approval of this License Amendment Request.

In the current configuration, the P-7 interlock actuates to remove the low power block (enable reactor trips) whenever two of four Power Range Neutron Flux channels detect that power is greater than 10% Rated Thermal Power (permissive P-10) or one of two turbine impulse pressure channels detect that the steam pressure is greater than approximately 10% of the rated full power pressure (permissive P-13). After installation and testing of the engineering change, the permissive P-13 will operate in the same manner when one of two turbine steam inlet channels detect that the steam pressure is above a pressure equivalent to approximately 10% of the rated full power pressure.

Since the indicated pressure at the new location on the main steam line is greater than the pressure sensed at the existing location, the end use devices (i.e., various indication, recording, monitoring, control, and protection functions) of the pressure signal will be affected, but these devices will be re-calibrated to respond to the revised turbine pressure versus Rated Thermal Power curve during the implementation of the change. In conclusion, the function and design basis of the P-13 logic is unaffected by this engineering change.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria:

McGuire will maintain the ability to meet the applicable General Design Criteria (GDC) as outlined in 10 CFR 50, Appendix A. The applicable GDCs are:

- GDC-13, Instrumentation and Control
- GDC-20, Protection System Functions

CRITERION 13 - INSTRUMENTATION AND CONTROL

Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the Containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

CRITERION 20 - PROTECTION SYSTEM FUNCTIONS

The protection system shall be designed:

1. *To initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences, and*
2. *To sense accident conditions and to initiate the operation of systems and components important to safety.*

4.2 Precedent:

This proposed license amendment was modeled after similar amendments submitted by the Beaver Valley Power Station and the Salem Nuclear Generating Station, approved by the NRC on February 24, 2003 (ADAMS Accession No ML030560174) and October 1, 2003 (ADAMS Accession No ML032370119), respectively.

4.3 Significant Hazards Consideration

Duke Energy proposes the revision of Technical Specification 3.3.1, Reactor Trip System (RTS) Instrumentation, Table 3.3.1-1, Function 16(e) by replacing the phrase "Turbine Impulse Pressure" with "Turbine Inlet Pressure." The proposed change results in a generic statement of the P-13 requirement, without specifying a particular turbine blade design. The requested change allows flexibility for future replacement of the McGuire Nuclear Station high pressure (HP) turbines.

Duke Energy has evaluated whether or not a significant hazard consideration is involved with the proposed changes by analyzing the three (3) standards set forth in 10 CFR 50.92(c) as discussed below:

Criterion 1:

Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change to replace the phrase "Turbine Impulse Pressure, P-13" with "Turbine Inlet Pressure, P-13" in the descriptive text associated with Technical Specification 3.3.1, Reactor Trip System Instrumentation, Table 3.3.1-1, Function 16, Reactor Trip System Interlocks, item (e), does not involve any physical or design change to the P-13 function. The proposed change renames the turbine inlet pressure to reflect a change in turbine design and the new location where the pressure is sensed. The change is intended to eliminate any potential confusion regarding turbine type or the sensing location.

The proposed clarification of the P-13 function does not introduce an initiator or any design basis accident or event. The proposed change is consistent with the safety analysis assumptions and resultant consequences. In that the P-13 function is not affected, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Criterion 2:

Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The relationship between turbine inlet pressure and the Rated Thermal Power (RTP) at the new location will be verified during testing. Although the pressure sensed at the new location is higher than the pressure sensed at the current location, the end use devices (i.e., various indication, recording, monitoring, control, and protection functions) of the RTS and associated functions will be recalibrated/re-scaled as necessary to maintain their basic functions. The response of the P-13 logic is unaffected, and the design function of the instrument loops has not changed.

Because the proposed change to replace the phrase "Turbine Impulse Pressure, P-13" with "Turbine Inlet Pressure, P-13" in Table 3.3.1-1, Function 16(e), does not involve a physical or design change to the P-13 function, no new accident causal mechanisms are created as a result of the requested changes which would result in the possibility of a new or different kind of accident from any accident previously evaluated.

Criterion 3:

Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

Implementation of this amendment will not result in a significant reduction in the margin of safety. Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident situation. These barriers include the fuel cladding, the reactor coolant system, and the containment system. The performance of these barriers will not be impacted by the proposed change.

The requirement for turbine pressure input in the P-13 RTS interlock is that the P-13 signal be representative of the RTP. This is accomplished by measuring the pressure at the HP turbine inlet because this pressure exhibits a consistent and accurate relationship with RTP.

The end use/device of the RTS and associated functions will be recalibrated/re-scaled as necessary to maintain their basic functions. The response of the P-13 logic is

unaffected by this modification. The design function of the instrument loops has not changed.

Therefore, the proposed change does not involve a significant reduction in the margin of safety.

The proposed change does not involve a physical or design change of the P-13 function and will not affect the operation of the RTS. Based on the above, Duke Energy concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be adverse to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

Duke Energy has evaluated the proposed changes and has determined that they do not involve: (1) a significant hazards consideration, (2) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (3) a significant increase in individual or cumulative occupational radiation exposures.

Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

a. Beaver Valley Power Station license amendment request, dated August 7, 2002, approved by the NRC on February 24, 2003 (ADAMS Accession No ML030560174)

b. Salem Nuclear Generating Station license amendment request, dated April 10, 2003, approved by the NRC on October 1, 2003 (ADAMS Accession No ML032370119)

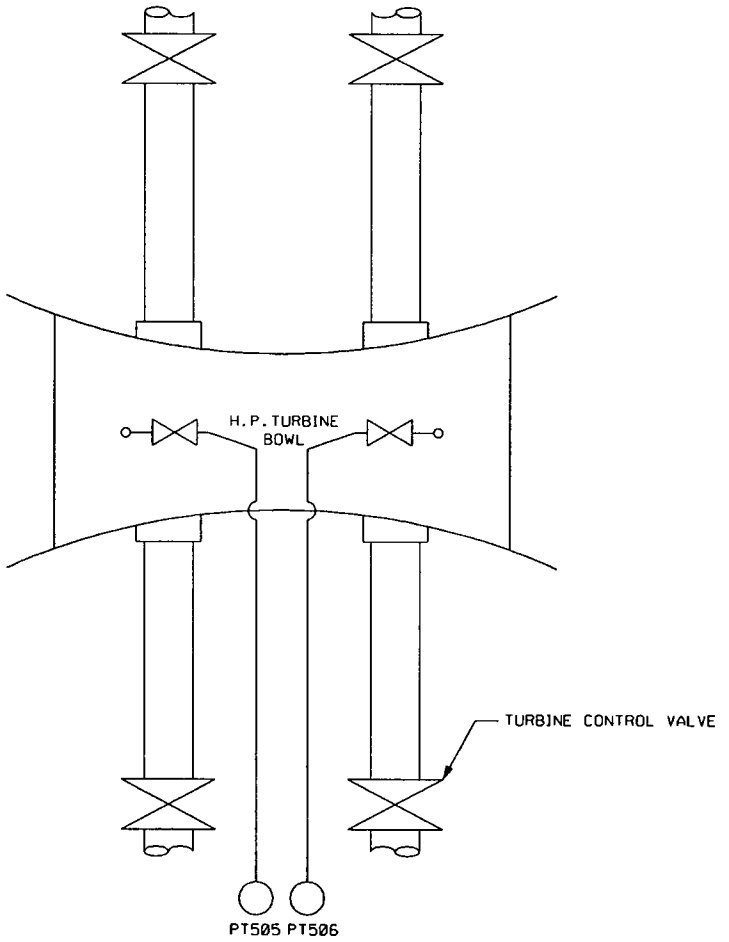

FIGURE 1
CURRENT LOCATION OF TRANSMITTERS PT505/PT506

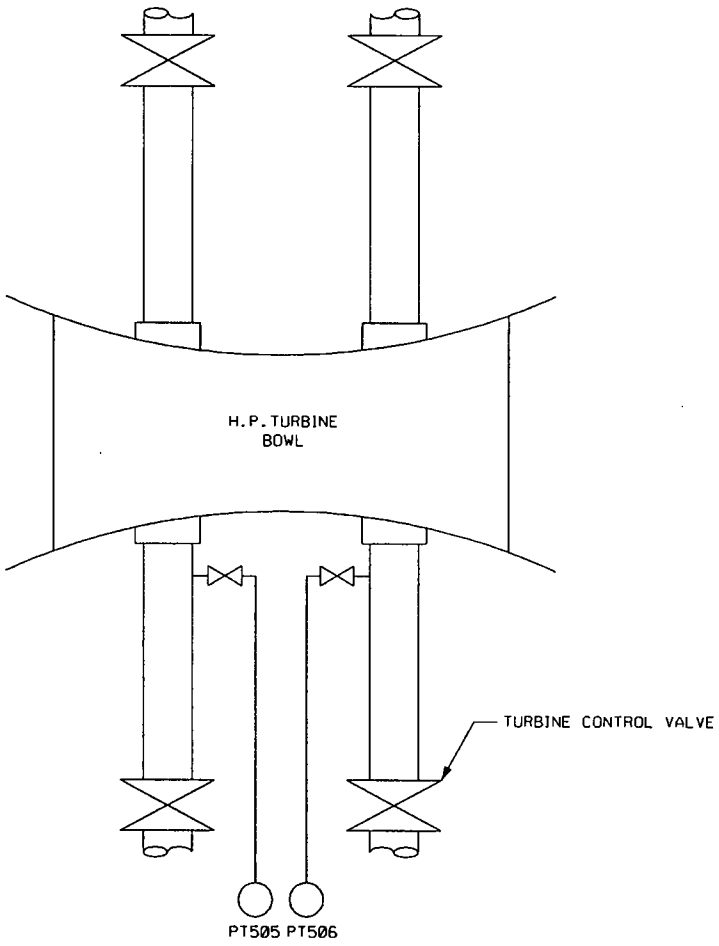

FIGURE 2
RELOCATED PRESSURE TRANSMITTERS PT505/PT506

ATTACHMENT 2

MARKED-UP TECHNICAL SPECIFICATION PAGE

Table 3.3.1-1 (page 4 of 7)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
16. Reactor Trip System Interlocks						
a. Intermediate Range Neutron Flux, P-6	2[d]	2	S	SR 3.3.1.11 SR 3.3.1.13	≥ 4E-11 amp*** ≥ 6.6E-6% RTP	1E-10 amp*** 1E-5% RTP
b. Low Power Reactor Trips Block, P-7	1	1 per train	T	SR 3.3.1.5	NA	NA
c. Power Range Neutron Flux, P-8	1	4	T	SR 3.3.1.11 SR 3.3.1.13	≤ 49% RTP	48% RTP
d. Power Range Neutron Flux, P-10	1,2	4	S	SR 3.3.1.11 SR 3.3.1.13	≥ 7% RTP and ≤ 11% RTP	10% RTP
e. Turbine ~~Impulse~~ Pressure, P-13	1	2	T	SR 3.3.1.12 SR 3.3.1.13	≤ 11% turbine ~~impulse~~ pressure equivalent	10% turbine ~~impulse~~ pressure equivalent
17. Reactor Trip Breakers[i]	1,2	2 trains	R, V	SR 3.3.1.4	NA	NA
	3[a], 4[a], 5[a]	2 trains	C	SR 3.3.1.4	NA	NA
18. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms	1,2	1 each per RTB	U	SR 3.3.1.4	NA	NA
	3[a], 4[a], 5[a]	1 each per RTB	C	SR 3.3.1.4	NA	NA
19. Automatic Trip Logic	1,2	2 trains	Q, V	SR 3.3.1.5	NA	NA
	3[a], 4[a], 5[a]	2 trains	C	SR 3.3.1.5	NA	NA

*** The ≥ 4E-11 amp Allowable Value and the 1E-10 amp NOMINAL TRIP SETPOINT value apply to the Westinghouse-supplied compensated ion chamber Intermediate Range neutron detectors. The compensated ion chamber neutron detectors are being replaced with Thermo Scientific-supplied fission chamber neutron detectors. The ≥ 6.6E-6% RTP Allowable Value and the 1E-5% RTP NOMINAL TRIP SETPOINT value apply to the replacement fission chamber Intermediate Range neutron detectors.

(a) With RTBs closed and Rod Control System capable of rod withdrawal.
(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
(i) Including any reactor trip bypass breakers that are racked in and closed for bypassing on RTP.

U.S. Nuclear Regulatory Commission
December 5, 2011

ATTACHMENT 3

MARKED-UP TECHNICAL SPECIFICATION BASES PAGES
(information only)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Pressurizer Pressure—Low

The Pressurizer Pressure—Low trip Function ensures that protection is provided against violating the DNBR limit due to low pressure.

The LCO requires four channels of Pressurizer Pressure—Low to be OPERABLE.

In MODE 1, when DNB is a major concern, the Pressurizer Pressure—Low trip must be OPERABLE. This trip Function is automatically enabled on increasing power by the P-7 interlock (NIS power range P-10 or turbine ~~impulse~~ pressure greater than approximately 10% of full power equivalent (P-13)). On decreasing power, this trip Function is automatically blocked below P-7. Below the P-7 setpoint, power distributions that would cause DNB concerns are unlikely.

INSERT

b. Pressurizer Pressure-High

The Pressurizer Pressure-High trip Function ensures that protection is provided against overpressurizing the RCS. This trip Function operates in conjunction with the pressurizer relief and safety valves to prevent RCS overpressure conditions.

The LCO requires four channels of the Pressurizer Pressure—High to be OPERABLE.

The Pressurizer Pressure-High LSSS is selected to be below the pressurizer safety valve actuation pressure and above the power operated relief valve (PORV) setting. This setting minimizes challenges to safety valves while avoiding unnecessary reactor trips for those pressure increases that can be controlled by the PORVs.

In MODE 1 or 2, the Pressurizer Pressure—High trip must be OPERABLE to help prevent RCS overpressurization and minimize challenges to the safety valves. In MODE 3, 4, 5, or 6, the Pressurizer Pressure—High trip Function does not have to be OPERABLE because transients that could cause an overpressure condition will be slow to occur. Therefore, the operator will have sufficient time to evaluate unit

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- on increasing power, the P-6 interlock allows the manual block of the NIS Source Range, Neutron Flux reactor trip. This prevents a premature block of the source range trip and allows the operator to ensure that the intermediate range is OPERABLE prior to leaving the source range; and

- on decreasing power, the P-6 interlock automatically enables the NIS Source Range Neutron Flux reactor trip.

The LCO requires two channels of Intermediate Range Neutron Flux, P-6 interlock to be OPERABLE in MODE 2 when below the P-6 interlock setpoint.

Above the P-6 interlock setpoint, the NIS Source Range Neutron Flux reactor trip will be blocked, and this Function will no longer be necessary.

In MODE 3, 4, 5, or 6, the P-6 interlock does not have to be OPERABLE because the NIS Source Range is providing core protection.

b. Low Power Reactor Trips Block, P-7

The Low Power Reactor Trips Block, P-7 interlock is actuated by input from either the Power Range Neutron Flux, P-10, or the Turbine ~~Impulse~~ Inlet Pressure, P-13 interlock. The LCO requirement for the P-7 interlock ensures that the following Functions are performed:

(1) on increasing power, the P-7 interlock automatically enables reactor trips on the following Functions:

- Pressurizer Pressure—Low;
- Pressurizer Water Level—High;
- Reactor Coolant Flow—Low (Two Loops);
- Undervoltage RCPs; and
- Underfrequency RCPs.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The LCO requires four channels of Power Range Neutron Flux, P-10 interlock to be OPERABLE in MODE 1 or 2.

OPERABILITY in MODE 1 ensures the Function is available to perform its decreasing power Functions in the event of a reactor shutdown. This Function must be OPERABLE in MODE 2 to ensure that core protection is provided during a startup or shutdown by the Power Range Neutron Flux-Low and Intermediate Range Neutron Flux reactor trips. In MODE 3, 4, 5, or 6, this Function does not have to be OPERABLE because the reactor is not at power and the Source Range Neutron Flux reactor trip provides core protection.

e. Turbine ~~Impulse~~ Pressure, P-13

The Turbine ~~Impulse~~ Pressure, P-13 interlock is actuated when the pressure ~~in the first stage of the~~ high pressure turbine is greater than approximately 10% of the rated full power pressure. This is determined by one-out-of-two pressure detectors. The LCO requirement for this Function ensures that one of the inputs to the P-7 interlock is available.

The LCO requires two channels of Turbine ~~Impulse~~ Pressure, P-13 interlock to be OPERABLE in MODE 1.

The Turbine ~~Impulse Chamber~~ Pressure, P-13 interlock must be OPERABLE when the turbine generator is operating. The interlock Function is not required OPERABLE in MODE 2, 3, 4, 5, or 6 because the turbine generator is not operating.

17. Reactor Trip Breakers

This trip Function applies to the RTBs exclusive of individual trip mechanisms. The LCO requires two OPERABLE trains of trip breakers. A trip breaker train consists of all trip breakers associated with a single RTS logic train that are racked in, closed, and capable of supplying power to the CRD System. Thus, the