ATTACHMENT 1

Proposed McGuire Unit 1 and 2 Technical Specification Changes

POWER DISTRIBUTION LIMITS

3/4.2.5 DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB related parameters shall be maintained within the limits shown on Table 3.2-1:

a. Reactor Coolant System T_{avg}, and

b. Pressurizer Pressure.

APPLICABILITY: MODE 1.

ACTION:

With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5 Each of the parameters of Table 3.2-1 shall be MEASURED BY AVERAGING THE INDICATIONS (METER OR COMPUTER) OF THE OPERABLE CHANNELS AND verified to be within their limits at least once per 12 hours.

TABLE 3.2-1

DNB PARAMETERS

PARAMETER	LIMITS Four Loops In Operation	Three Loops In Operation
Reactor Coolant System T_{avg}	$\leq$ 593°F	(**)
Pressurizer Pressure	$\geq$ 2230 psai*	(**)

*Limit not applicable during either a THERMAL POWER ramp in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step in excess of 10% of RATED THERMAL POWER.

**These values left blank pending NRC approval of three loop operation.

REPLACE WITH INSERT (X)

INSERT X

PARAMETER	INDICATION	# OPERABLE CHANNELS	LIMITS*
Indicated Reactor Coolant System T_{avg}	meter	4	$\leq$590.5°F
	meter	3	$\leq$590.2°F
	computer	4	$\leq$591.0°F
	computer	3	$\leq$590.8°F
Indicated Pressurizer Pressure**	meter	4	$\geq$2226.5 psig
	meter	3	$\geq$2229.8 psig
	computer	4	$\geq$2221.7 psig
	computer	3	$\geq$2224.2 psig

*Limits applicable during four loop operation.

**Limits not applicable during either a THERMAL POWER ramp in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step in excess of 10% RATED THERMAL POWER.

3/4.2.4 QUADRANT POWER TILT RATIO

The QUADRANT POWER TILT RATIO limit assures that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during STARTUP testing and periodically during power operation.

The 2-hour time allowance for operation with a tilt condition greater than 1.02 but less than 1.09 is provided to allow identification and correction of a dropped or misaligned rod. In the event such action does not correct the tilt, the margin for uncertainty on F_Q is reinstated by reducing the power by 3% from RATED THERMAL POWER for each percent of tilt in excess of 1.0.

For purposes of monitoring QUADRANT POWER TILT RATIO when one excore detector is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the QUADRANT POWER TILT RATIO. The incore detector monitoring is done with a full incore flux map or two sets of four symmetric thimbles. The two sets of four symmetric thimbles is a unique set of eight detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, N-8.

3/4.2.5 DNB PARAMETERS

The limits on the DNB-related parameters assure that each of the parameters are maintained within the normal steady-state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been analytically demonstrated adequate to maintain a design limit DNBR throughout each analyzed transient.

The 12-hour periodic surveillance of these parameters through instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. INDICATION INSTRUMENTATION MEASUREMENT UNCERTAINTIES ARE ACCOUNTED FOR IN THE LIMITS PROVIDED IN TABLE 3.2-1.

→ THE INDICATED T_{AVG} VALUES AND THE INDICATED PRESSURIZER PRESSURE VALUES CORRESPOND TO ANALYTICAL LIMITS OF 592.6°F AND 2220 PSIA RESPECTIVELY, WITH ALLOWANCE FOR INDICATION INSTRUMENTATION MEASUREMENT UNCERTAINTY.

Attachment 2

JUSTIFICATION AND SAFETY ANALYSIS

The safety analysis assumptions associated with the DNB parameters Reactor Coolant System T_{avg} and Pressurizer Pressure are 592.6°F and 2220 psia respectively (FSAR Section 15.0). The existing Technical Specification 3.2.5 specifying these limits does not account for indication instrumentation measurement uncertainties and therefore requires that the measured values as given by station indication instrumentation for these parameters be adjusted for instrumentation uncertainties prior to the comparison with the limits of Technical Specification Table 3.2-1. The proposed revision adjusts these limits to include the instrumentation uncertainties, allowing direct comparison against measured values as indicated on station instrumentation to ensure operation within the steady-state envelope assumed in the safety analysis. (Note: Pressurizer Pressure limits are now being specified in psig (vs. psia) since station indication instrumentation is in psig). Appropriate limits are defined for both analog meter and digital computer indications and assuming the measured values of the parameters T_{avg} and Pressurizer Pressure are defined as the average of either four or three independent operable channels.

The revised Technical Specification is based upon the DNB limited safety analysis initial condition assumptions (including safety analysis allowances), and plant specific estimates for the indication instrumentation uncertainties. For most accidents which are DNB limited, nominal values of initial conditions are assumed. The allowances on temperature and pressure are determined on a statistical basis and are included in the limit DNBR, as described in WCAP-8330, Westinghouse Anticipated Transients without Trip Analysis, August 1974 (This procedure is known as the "Improved Thermal Design Procedure"). For DNB limited accidents for which the Improved Thermal Design Procedure is not employed, the initial conditions are obtained by adding the maximum steady state errors to rated values. The following conservative steady state errors were assumed in the analysis for average Reactor Coolant System Temperature and Pressurizer Pressure: 4.0°F allowance for controller deadband and measurement error; ±30 psi allowance for steady state fluctuations and measurement error (Ref. FSAR Section 15.0.3.2). Note: The term "measurement error" as used above is addressing control system errors (i.e. control system operating tolerances) and does not involve station indication instrumentation measurement uncertainties. Measurement uncertainties were calculated for indicated values of T_{avg} and Pressurizer Pressure consistent with the methodologies and allowances used in the determination of protection system setpoints. The uncertainty allowances for the indicator and readability result in the difference in requirements dependent upon whether the parameter value is read from an analog meter or digital computer output. The calculation determined the accuracy associated with a single instrument channel and estimates the parameter uncertainty based upon the number of channels averaged to determine the best estimate value of T_{avg} or Pressurizer Pressure.

The calculation of the Pressurizer Pressure requirements is provided as follows:

Nominal Value	- 2250 psia (2235.3 psig)
Safety Analysis Allowance	- 30 psi
Channel Accuracy (Analog)	- 42.4 psi
Channel Accuracy (Computer)	- 32.8 psi

To determine parameter uncertainty for the average of four independent channels, divide single channel accuracy by 2. For the average of three independent channels, divide the single channel accuracy by $\sqrt{3}$. The requirements are:

meter, 4 channels; limit $\geq$ (2235.3 - 30 + (42.4/2))
limit $\geq$ 2226.5 psig

meter, 3 channels; limit $\geq$ (2235.3 - 30 + (42.4/$\sqrt{3}$))
limit $\geq$ 2229.8 psig

computer, 4 channels; limit $\geq$ (2235.3 - 30 + (32.8/2))
limit $\geq$ 2221.7 psig

computer, 3 channels; limit $\geq$ (2235.2 - 30 + (32.8/$\sqrt{3}$))
limit $\geq$ 2224.2 psig

The requirements for the T_{avg} parameter indications are determined in the same manner based upon a nominal value of 588.6°F, a safety analysis allowance of 4.0°F, and single channel uncertainties of 4.2°F and 3.2° F for meter and computer indications respectively.

It should be noted that the existing Technical Specification specifies a Pressurizer Pressure limit of 2230 psia rather than the 2220 psia (nominal 2250 psia - 30 psi safety analysis allowance) used to calculate the new indication limits. This 2230 psia value is incorrect (possibly due to typographical error) and is overly conservative with respect to FSAR safety analysis assumptions. Consequently, basing the new indication limits on the lower 2220 psia safety analysis assumption value has no adverse safety implications. In addition, the existing Technical Specification specifies a Reactor Coolant System T_{avg} of 593°F (FSAR safety analysis assumption of 592.6°F rounded off). Since the new indication values are calculated using the lower (and therefore more conservative) 592.6°F value and are not rounded off, they are slightly more restrictive than the current 593°F value.

The surveillance requirement is appropriately revised to reflect the various types of indications (meter or computer) and to require averaging of the operable channels (with a minimum of 3 operable channels) of indication to verify the limits. The format of Table 3.2-1 is altered similarly to provide the limits for the various Indication/# Operable Channels combinations (Note that the provisions for including possible future 3 loop operation values have been deleted, with the table applying only to 4 loop operation). The Technical Specification's bases is also revised accordingly.

As additional justification of the amendments acceptability, the current draft version of NUREG-0452, Standard Technical Specifications for Westinghouse Pressurized Water Reactors, revision 5 incorporates a similar "indication" concept for the DNB parameters Technical Specification. Also, an identical change is currently under review by the NRC as part of the proposed Catawba Nuclear Station Units 1 and 2 Technical Specifications (Ref. Mr. H. B. Tucker's (DPC) August 7, 1985 letter to Mr. H. R. Denton (NRC/ONRR)).

In summary, the proposed Technical Specification revisions basically only adjust the specified DNB parameter limits from analytical values to operational (indication) values and do not constitute a change to the limits themselves (except as noted above). Consequently, Duke Power Company concludes that the proposed amendments allowing direct comparison between station instrumentation and Technical specifications are more operational oriented and have no adverse safety implications.

Attachment 3

ANALYSIS OF SIGNIFICANT HAZARDS CONSIDERATION

As required by 10 CFR 50.91, this analysis is provided concerning whether the proposed amendments involve significant hazards considerations, as defined by 10 CFR 50.92. Standards for determination that a proposed amendment involves no significant hazards considerations are if operation of the facility in accordance with 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.

The proposed amendments basically only adjust the specified DNB parameter limits from analytical values to operational (indication) values and do not constitute a change to the limits themselves (except as noted below). Adjusting limits from analytical to indication values has no effect on the probability or consequences of an accident previously evaluated as the actual limits are unaffected. In addition, no new or different kind of accident from any accident previously evaluated could be created since such an adjustment can have no effect on causal mechanisms. Further, adjusting limits from analytical to indication values does not involve a reduction in a margin of safety since the actual limits are unaffected.

Basing the new Pressurizer Pressure indication limits on the lower 2220 psia value (vs. the 2230 psia of the current Technical Specification) does not involve a significant hazards consideration. The commission has provided examples of amendments likely to involve no significant hazards consideration (48 FR 14870). One example of this type is (vi), "A change which either may result in some increase to the probability or consequences of a previously analyzed accident or may reduce in some way a safety margin, but where results of the change are clearly within all acceptable criteria with respect to the system or component specified in the standard review plan: for example, a change resulting from the application of a small refinement of a previously used calculational model or design method". Because the conservative assumptions of the accident analyses are unchanged by this difference, the example cited above can be applied to this aspect of the amendments.

The new Reactor Coolant System T_{avg} indication limits were calculated using the lower (and therefore more conservative) value of 592.6°F (vs. the rounded off 593°F value currently in the Technical Specification), and were not rounded off. Example (ii) of commission provided (48 FR 14870) examples of amendments likely to involve no significant hazards consideration states: "A change that constitutes an additional limitation, restriction, or control not presently included in the Technical Specifications: For example, a more stringent surveillance requirement". Since the new indication limits are consequently slightly more restrictive than the current 593°F value, the above cited example can be applied to this aspect of the amendments.

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