

ATTACHMENT 2

PROPOSED CHANGES

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4.4 INSTRUMENTATION AND CONTROL SYSTEMS - LIMITING CONDITIONS FOR OPERATION

Applicability

Applies to the plant protective system and other critical instrumentation and controls.

Objective

To assure the operability of the plant protective system and other critical instrumentation by defining the minimum operable instrument channels and trip settings.

Specification LCO 4.4.1 - Plant Protective System Instrumentation, Limiting Conditions for Operation

The limiting conditions for the plant protective system instrumentation are shown on Tables 4.4-1 through 4.4-4. These tables utilize the following definitions:

Degree of Redundancy - Difference between the number of operable channels and the minimum number of operable channels which when tripped will cause an automatic system trip.

Operable Channel - A channel is operable if it is capable of fulfilling its design functions.

Inoperable Channel - Opposite of operable channel.

Tables 4.4-1 through 4.4-4 are to be read in the following manner: If the minimum operable channels or the minimum degree of redundancy for each functional unit of a table cannot be met or cannot be bypassed under the stated permissible bypass conditions, the following action shall be taken:

For Table 4.4-1, the reactor shall be shut down within 12 hours, except that to facilitate maintenance on the Plant Protective System (PPS) moisture monitors, the moisture monitor input trip functions to the Plant Protective System which cause scram, loop shutdown, circulator trip, and steam water dump may be disabled for up to 72 hours. During the time that the Plant Protective System moisture monitor trips are disabled, an observer in direct communication with the reactor operator shall be positioned in the control room in the location of pertinent instrumentation. The observer shall continuously monitor the primary coolant moisture levels indicated by at least two moisture monitors and the primary coolant pressure indications, and shall alert the reactor operator to any indicated moisture or pressure change.

For Table 4.4-2, the affected loop shall be shut down within 12 hours.

For Table 4.4-3, the affected helium circulator shall be shut down within 12 hours.

For Table 4.4-4, the reactor shall be shut down within 24 hours.

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If, within the indicated time limit, the minimum number of operable channels and the minimum degree of redundancy can be reestablished, the system is considered normal and no further action needs to be taken.

Specification LCO 4.4.1

NOTES FOR TABLES 4.4.1 THROUGH 4.4-4

- (a) See Specification LSSS3.3 for trip setting.
- (b) Two thermocouples from each loop, total of four, constitute one channel. For each channel, two thermocouples must be operable in at least one operating loop for that channel to be considered operable.
- (c) With one primary coolant high level moisture monitor tripped, trips of either loop primary coolant moisture monitors will cause full scram. Hence, number of operable channels (1) minus minimum number required to cause scram (0) equals one, the minimum degree of redundancy.
- (d) Both 480 volt buses 1A and 1C loss of voltage for no longer than 35 seconds.
- (e) One channel consists of one undervoltage relay from each of the two 480 volt buses (two undervoltage relays per channel). These relays fail open which is the direction required to initiate a scram.
- (f) The inoperable channel must be in the tripped condition, unless the trip of the channel will cause the protective action to occur. Failure to trip the inoperable channel requires taking the appropriate corrective action as listed on Pages 4.4-1 and 4.4-2 within the specified time limit.
- (g) RWP bypass permitted if the bypass also causes associated single channel scram.
- (h) Permissible Bypass Conditions:
 - I. Any circulator buffer seal malfunction.
 - II. Loop hot reheat header high activity.
 - III. As stated in LCO 4.9.2
- (j) Items 1a., 1c., or 1d. accompanied by 2a., 2b., 2c., or 2d. on Table 4.4-2 are required for loop 1 shutdown.. Items 1b., 1e. or 1f., accompanied by 2a., 2b., 2c., or 2d. on Table 4.4-2 are required for loop 2 shutdown.
- (k) One operable helium circulator inlet thermocouple in an operable loop is required for the channel to be considered operable.
- (m) Low Power RWP bistable resets at 4% after reactor power initially exceeds 5%.
- (n) Power range RWP bistables automatically reset at 10% after reactor power is decreased from greater than 30%. The RWP may be manually reset between 10% and 30% power.
- (p) Item 7a. must be accompanied by item 7c for loop 1 shutdown.
Item 7b. must be accompanied by item 7c for loop 2 shutdown.

Basis for Specification LCG 4.4-1

The plant protection system automatically initiates protective functions to prevent established limits from being exceeded. In addition, other protective instrumentation is provided to initiate action which mitigates the consequences of accidents. This specification provides the limiting conditions for operation necessary to preserve the effectiveness of these instrument systems.

If the minimum operable channels or the minimum degrees of redundancy for each functional unit of a table cannot be met or cannot be bypassed under the stated permissible bypass conditions, the following actions shall be taken:

For Table 4.4-1, the reactor shall be shut down within 12 hours.

For Table 4.4-2, the affected loop shall be shut down within 12 hours.

For Table 4.4-3, the affected helium circulator shall be shut down within 12 hours.

For Table 4.4-4, the reactor shall be shut down within 24 hours.

If, within the indicated time limit, the minimum number of operable channels and the minimum degree of redundancy can be reestablished, the system is considered normal and no further action needs to be taken.

The trip level settings are included in this section of the specification. The bases for these settings are briefly discussed below. Additional discussions pertaining to the scram, loop shutdown and circulator trip inputs may be found in Section 7.1 of the FSAR. High moisture instrumentation is discussed in Section 7.3 of the FSAR.

Specification LCO 4.4-2 - Control Room Temperature - Limiting Condition for Operation

The reactor shall not be operated at power if the control room temperature exceeds 120°F.

Basis for Specification LCO 4.4.2

The limiting temperature in the control room is established to assure no over temperature condition which might cause damage to essential instrumentation and control equipment. Satisfactory operation of safety related control and, electrical equipment located in the control room for temperatures up to 120°F is discussed in FSAR Amendment No. 19, Question 7.5.

Specification LCO 4.4-2 - Area Radiation Monitors - Limiting Condition for Operation

At least one area radiation monitor from each group shall be operable. If any area monitor becomes inoperable, a portable monitor equipped with an alarm shall be placed in the area, and all personnel notified of the condition.

Basis for Specification LCO 4.4.3

The grouping of area radiation monitors is such that each monitor in the group supplements the others in the group.

The notification of personnel of any malfunction, coupled with the provision of a portable instrument, or a replacement, adequately ensures protection for personnel, and detection of abnormalities.

The detectors are grouped as follows:

Specification LCO 4.4-4 - Seismic Instrumentation - Limiting Conditions
for Operation

The reactor shall not be operated at power unless three (3) of the six (6) seismic instruments are operable.

Basis for Specification LCO 4.4.4

The monitoring provided by three (3) seismic instruments, in the event of an earthquake, is adequate to determine the ground acceleration at the site.

Specification LCO 4.4.5 - Analytical System Primary Coolant Moisture
Instrumentation - Limiting Condition for Operation

The reactor shall not be operated between a shutdown condition and 5% power during startup unless the primary coolant is being sampled by two monitors, normally from the Analytical System.

If one of the two moisture monitors above becomes inoperable while increasing reactor power between shutdown and 5%, a second monitor shall be made operable or the reactor shall be shut down within 12 hours.

If all available moisture monitors become inoperable, during the above mentioned power increase, the reactor shall be shut down immediately.

During reactor power reduction from 5% power to shutdown conditions, at least one moisture monitor must be in operation. If all available moisture monitors become inoperable, the reactor shall be shut down immediately.

Basis for Specification LCO 4.4.5

During reactor operation, primary coolant moisture monitors are required below 5% reactor power for administration of LCO 4.2.11. One moisture monitor is sufficient to detect primary coolant moisture content on a continual basis.

Two analytical system moisture monitors will normally be in service sampling primary coolant. These analytical moisture monitors do not provide any automatic action (other than an alarm function). Alternate moisture monitors can also be placed in service sampling primary coolant, such as through re-alignment of a moisture monitor in the analytical system or utilization of operable (as defined in LCO 4.4.1, Note (t)) plant protective system dewpoint moisture monitors placed in the "indicate" mode (note that in the "indicate" mode a trip is input to the PPS). Operator action is required to take corrective action in the event of high moisture levels in the primary coolant in the shutdown to 5% reactor power range.

Operator reaction time to shut down the reactor in the event of high moisture levels in the primary coolant system at reactor power levels of 5% or less are acceptable. As indicated by Figure 4-2 in Document GA-A13677, Test and Evaluation of the Fort St. Vrain Dew Point Moisture Monitors System, one of the limiting parameters for determining required response times to shut the reactor down in the event of high primary coolant moisture is graphite oxidation. The allowable weight loss of the hottest fuel element in the core is 1%.

At operating temperatures experienced at 5% reactor power, response times to scram the reactor to limit oxidation to 1% by weight is approximately 6700 seconds, well within the capabilities of an operator.

ATTACHMENT 3

SIGNIFICANT HAZARDS CONSIDERATIONS

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I. EVALUATION

LCO 4.4.1

Allowing the footnote to the action statement for Table 4.4-1 to become permanent does not change any of the NRC Safety Evaluation conclusions stated in the Amendment No. 31 approval (G-83039, Jan. 20, 1983). Dedicated individual monitoring of moisture levels and primary coolant pressure will provide an acceptable level of protection during the short time (72 hours) the moisture monitors are disabled for maintenance.

LCO 4.4.5

As reported in the Nuclear Regulatory Commission I & E Inspection Report 82-31, dated January 21, 1983 (G-83041), LCO 4.4.5 is worded as to address only two monitors (ME-9306 and ME-9307). There presently exists other moisture monitors capable of providing the required range of dewpoint indication for administration of LCO 4.2.11.

One alternate to ME-9306 (or ME-9307) is ME-9305, installed in the analytical instrumentation panel. ME-9305, normally lined-up to sample a purified helium train component effluent, can be aligned to provide an analysis of primary coolant moisture.

Other alternatives to ME-9306 (or ME-9307) are the plant protective system (PPS) dewpoint moisture monitors (DPMM) operating in the "indicate" or in the after-trip of the "trip/indicate" mode. Equipment Specification No. 93-I-15 and O & M Manual 93-I-15-240 verify adequate dewpoint indication for administration of LCO 4.2.11.

Allowing the use of alternate indication moisture monitors has not increased or changed the probability or the consequences of an accident or malfunction. Operator administration of the dew point limits specified in LCO 4.2.11 will be readily available regardless of which moisture monitor indication is being used. The provisions for use of alternate monitors will increase the availability of operable monitors. An accident or malfunction of a different type has not been created, because failure of an alternate monitor is no different than a failure of a monitor normally in use. The margin of safety, as defined by the present LCO 4.4.5 and its basis, has not been reduced because the required number of operable primary coolant moisture monitors between shutdown conditions and 5% power has not been reduced.

II. CONCLUSION

Based on the above evaluation, it is concluded that operation of Fort St. Vrain in accordance with the proposed changes will not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in any margin of safety.

Therefore, these changes will not increase the risk to the health and safety of the public nor do they involve any significant hazards considerations.