ATTACHMENT 1

PROPOSED CHANGES TO APPENDIX A

TECHNICAL SPECIFICATION OF FACILITY

OPERATING LICENSES NPF-37, NPF-66, NPF-72 AND NPF-77

BYRON STATION

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BRAIDWOOD STATION

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3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full-length shutdown and control rods shall be OPERABLE and positioned within ± 12 steps (indicated position) of their group step counter demand position.

APPLICABILITY: MODES 1* and 2*.

ACTION:

a. With one or more full-length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.

~~b. With more than one full-length rod inoperable or misaligned from its group step counter demand position by more than ± 12 steps (indicated position), be in HOT STANDBY within 6 hours.~~

b. With one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that within 1 hour:

1. The rod is restored to OPERABLE status within the above alignment requirements, or
2. The rod is declared inoperable and the remainder of the rods in the group with the inoperable rod are aligned to within ± 12 steps of the inoperable rod while maintaining the rod sequence and insertion limits of Figure 3.1-1. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or
3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
   a) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within the next hour and within the following 4 hours the High Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER.
   b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours;

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours; and

d) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions;

C. (Insert new Action C. attached)

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full-length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the rod position deviation monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full-length rod not fully inserted in the core shall be determined OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

BASES

MOVABLE CONTROL ASSEMBLIES (Continued)

18, 210, and 228 steps withdrawn for the Shutdown Banks provides assurances that the Digital Rod Position Indicator is operating correctly over the full range of indication. Since the Digital Rod Position System does not indicate the actual shutdown rod position between 18 steps and 210 steps, only points in the indicated ranges are picked for verification of agreement with demanded position.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Inoperability or misalignment of a single, trippable rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by an inoperable or misaligned rod are reevaluated to confirm that the results remain valid during future operation. * Insert attached, same Pg *

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with T_{avg} greater than or equal to 550°F and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a Reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if a rod position deviation monitor is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

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c. With more than one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated postion), POWER OPERATION may continue provided that:

1. Within 1 hour, the remainder of the rods in the group(s) with the inoperable rods are aligned to within ± 12 steps of the inoperable rods while maintaining the rod sequence and insertion limits of Figure 3.1-1. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and

2. The inoperable rods shall be restored to OPERABLE status within 72 hours.

Otherwise, be in HOT STANDBY within 6 hours.

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With multiple inoperable or misaligned, but trippable, rods; alignment of the remaining rods in the bank(s) to within ± 12 steps of the inoperable rods, and restriction in THERMAL POWER assures fuel rod integrity during continued operation.

For Specification 3.1.3.1 ACTIONS b. and c., it is incumbent on the plant to confirm trippability of the inoperable rod(s). This confirmation may be, for example, by verification of a control system failure, usually electrical in nature (such as an Urgent Failure Alarm), or that the failure is associated with the control rod stepping mechanism. In the event the plant is unable to verify the rod(s) trippability, it must be assumed to be untrippable and thus falls under the requirements of ACTION a.

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3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full-length shutdown and control rods shall be OPERABLE and positioned within ± 12 steps (indicated position) of their group step counter demand position.

APPLICABILITY: MODES 1* and 2*.

ACTION:

a. With one or more full-length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.

~~b. With more than one full-length rod inoperable or misaligned from the group step counter demand position by more than ± 12 steps (indicated position), be in HOT STANDBY within 6 hour.~~

b. With one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that within 1 hour:

1. The rod is restored to OPERABLE status within the above alignment requirements, or

2. The rod is declared inoperable and the remainder of the rods in the group with the inoperable rod are aligned to within ± 12 steps of the inoperable rod while maintaining the rod sequence and insertion limits of Figure 3.1-1. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or

3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:

   a) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within the next hour and within the following 4 hours the High Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER.

   b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours;

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours; and

d) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions;

C. (Insert new Action c, attached)

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full-length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the rod position deviation monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full-length rod not fully inserted in the core shall be determined OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

MOVABLE CONTROL ASSEMBLIES (Continued)

18, 210, and 228 steps withdrawn for the Shutdown Banks provides assurances that the Digital Rod Position Indicator is operating correctly over the full range of indication. Since the Digital Rod Position System does not indicate the actual shutdown rod position between 18 steps and 210 steps, only points in the indicated ranges are picked for verification of agreement with demanded position.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation. * Insert attached, same HF

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with T_{avg} greater than or equal to 550°F and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a Reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if a rod position deviation monitor is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

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c. With more than one full-length rod trippable but inoperable due to causes other than addressed by ACTION a. above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated postion), POWER OPERATION may continue provided that:

1. Within 1 hour, the remainder of the rods in the group(s) with the inoperable rods are aligned to within ± 12 steps of the inoperable rods while maintaining the rod sequence and insertion limits of Figure 3.1-1. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and

2. The inoperable rods shall be restored to OPERABLE status within 72 hours.

Otherwise, be in HOT STANDBY within 6 hours.

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(continue with paragraph)

With multiple inoperable or misaligned, but trippable, rods; alignment of the remaining rods in the bank(s) to within ± 12 steps of the inoperable rods, and restriction in THERMAL POWER assures fuel rod integrity during continued operation.

For Specification 3.1.3.1 ACTIONS b. and c., it is incumbent on the plant to confirm trippability of the inoperable rod(s). This confirmation may be, for example, by verification of a control system failure, usually electrical in nature (such as an Urgent Failure Alarm), or that the failure is associated with the control rod stepping mechanism. In the event the plant is unable to verify the rod(s) trippability, it must be assumed to be untrippeble and thus falls under the requirements of ACTION a.

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ATTACHMENT 2

DESCRIPTION AND BASES OF THE PROPOSED CHANGES

The proposed changes revise the Action Statement for Technical Specification 3.1.3.1. Moveable Control Assemblies and the associated Bases Section. The revision adds an Action Statement to address the condition when more than one full length rod is inoperable but still capable of insertion into the core upon receipt of a reactor trip signal. Under this condition, the Action Statement permits continued operation for up to 72 hours before a unit shutdown is required. The 72 hours permits time for diagnosis and repair of the inoperable but trippable rods. This time extension can potentially prevent an unnecessary transient on the plant required by a shutdown while still maintaining the safety of the unit since the reactor control and shutdown rods can perform their intended safety function of insertion into the core upon receipt of a reactor trip signal.

The purpose of the Control Rod Drive System (CRDS) is two-fold. The CRDS performs a control function which serves to insert or withdraw rod cluster control assemblies within the reactor core to control average core temperature to a program value (Tref). During a temporary loss of the ability to adjust rod height, the function of maintaining average core temperature in accordance with its program value (Tref) can be accomplished by either boron changes or by changing power level. The CRDS performs its protection or safety function, reactor trip, by placing the reactor in a subcritical condition when a safety system setting is approached with any assumed credible failure of a single active component. The protection system (reactor trip function) is designed to be independent and isolated from the rod control system. Therefore, a failure in the rod control system does not impact the ability of the protection portion of the CRDS to perform a reactor trip.

The operability of the shutdown and control rod banks are initial assumptions in all safety analyses which assume rod insertion upon reactor trip. This ensures the assumed reactivity is available for insertion. In addition, operability requires maintenance of proper bank withdrawal and overlap requirements so that correct power distribution and control rod alignment are maintained.

Technical Specification 3.1.3.1 requires all shutdown and control rods to be operable and positioned within ± 12 steps of their group step counter demand position. The moveable control assemblies Technical Specification 3.1.3.1 ensures that (1) acceptable power distribution limits are maintained, (2) the minimum shutdown margin is maintained and (3) the potential effects of rod misalignment on associated accident analyses are limited.

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For one rod being inoperable, the Action Requirements vary significantly depending on whether the rod is immovable or untrippable or whether it is still trippable. For the rod that is immovable or untrippable the Unit must be placed in Mode 3 within 6 hours. For a rod that is inoperable but still trippable, unit operation may continue indefinitely provided the Action Requirements of maintaining rod alignment and sequence and insertion limits are met; or power and the associated trip setpoints are reduced and the shutdown margin, power distribution, and reevaluation of certain accident analyses are performed per the Action Requirements. For individual rod inoperability, the current Technical Specification acknowledges the significance between the rod being immovable or known to be untrippable and the rod just being inoperable but trippable. However, the Technical Specification does not permit the same flexibility when more than one rod is inoperable but still trippable. Action b requires that with more than one full length rod inoperable or misaligned from the group step counter demand position by more than ± 12 steps then the Unit must be placed in Mode 3 within 6 hours.

The proposed amendment request provides a distinct Action Requirement for more than one inoperable but trippable rod that is consistent with the significance of the malfunction, and the original bases of the specification. Having more than one rod inoperable due to being untrippable is more significant than having more than one rod that cannot be stepped due to an electrical malfunction, but remaining trippable. Distinguishing between these types of malfunctions will allow an appropriate time period to complete corrective action commensurate with the significance of the malfunction. Therefore, the proposed amendment allows continued operation for 72 hours with more than one rod inoperable provided all the rods remain trippable. However, the new action protects the original bases of the Moveable Control Assemblies Specifications by requiring the remainder of the rods in the group(s) with the inoperable rods be aligned to within ± 12 steps of the inoperable rods while observing the other specifications of the section. The 72 hour interval permits a reasonable amount of time for diagnosis and repair of the inoperable rods. Thus, possibly eliminating a unit shutdown that can result in an unnecessary transient on the plant while the rods are still capable of performing their intended safety function.

In most cases when more than one rod is found to be trippable (and aligned) but inoperable, the malfunction can be traced to the Rod Control System. The typical situation that has occurred at Byron and Braidwood Stations is that when multiple rods are inoperable a Rod Control Urgent Failure alarm occurs. This alarm is indicative of an electronic/electrical malfunction occurring within the logic or power supply portion of the CRDS. The conditions that can cause this alarm do not affect the ability to trip any control rods. This may result in a situation where the control rods cannot be stepped in or out of the reactor. However, the rods remain trippable and are therefore capable of performing their safety function. Since the majority of CRDS malfunctions can be repaired without a reactor shutdown and since plant conditions are not outside any accident analysis assumptions, there is time available to locate the malfunction and restore the rods to an operable status.

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The proposed changes reflect recommended wording provided to the NRC by a Westinghouse letter (E.P. Rahe) to NRC (C.O. Thomas) dated 12/21/84. The proposed Action Statement was developed as a result of several occurrences at different plants that involved a group or several groups of control rods that become immovable by a rod control system failure. Amendments similar to that proposed in the Westinghouse letter have previously been issued for several plants including Beaver Valley, Wolf Creek, Sharon Harris, Seabrook, Vogtle, South Texas and Millstone. Our proposed wording differs slightly from the wording included in the 1984 Westinghouse letter. The wording in this letter had a separate Action c and d. Action c.1 required that within one hour the remainder of the rods in the bank(s) with the inoperable rods are aligned to within ± 12 steps of the inoperable rods. Also, Action c had no specific Action Requirement in the event that the rods were not restored to operable status within 72 hours. Action d required that with more than one rod misaligned from its group step counter demand height by more than ± 12 steps, be in Hot Standby within 6 hours. The requirement for aligning rods was redundant between Actions c.1 and d, therefore, Action d was incorporated into Action c of the Stations proposed amendment.

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ATTACHMENT 3

EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATIONS

Commonwealth Edison has evaluated this proposed amendment and determined that it involves no significant hazards considerations. According to 10CFR50.92(c), a proposed amendment to an operating license involves no significant hazards considerations 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 the margin of safety.

This change will provide new Action Statement requirements to Specification 3.1.3.1 to restrict rod movement and thermal power levels with multiple inoperable, but trippable, control rods. In this condition the rods are unable to provide the normal control function, however,the safety related function of trippability is unaffected. This situation can be caused, for example, by a blown fuse in the non-safety related control circuitry. Following is a discussion of the Significant Hazards Evaluation addressing each of the questions above.

1. The operability of the shutdown and control rod banks are initial assumptions in all safety analyses which assume control rod insertion upon reactor trip. This ensures that sufficient reactivity is available to place the unit in a subcritical condition assuming a credible failure of a single active component. The proposed amendment does not affect the shutdown and control rods safety function of insertion into the core upon receipt of a reactor trip signal. The design of the Control Rod Drive System (CRDS) assures isolation of essential elements of the CRDS (those required to insure reactor trip) from nonessential portion of the CRDS.

   In the proposed revision to Action (c), there is a stipulation that the inoperable rods must still be trippable for continued operation to be permitted for an additional 72 hours. If the rods are not verified to be trippable the unit must be placed in Hot Standby within 6 hours. This requirement remains consistent with the current Technical Specifications.

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Determining that the rods are still trippable may be made, for example, by verification of a control system failure, usually electrical in nature (such as an Urgent Failure Alarm), or that the failure is associated with the control rod stepping mechanism. For the situation where multiple rods are inoperable but an Urgent Failure Alarm has not occurred, the mechanism coil currents can be monitored to differentiate whether the problem is associated with the control system or mechanism. If the control system will not vary the currents to the mechanism coils then the problem is in the control system and not the mechanism. If the control system varies currents to the coils then the mechanism may be suspect. Grossly abnormal currents would indicate control system problems and mildly abnormal currents would indicate mechanism problems. In the event that the rods trippability cannot be verified, the requirements of Action (a) would be applicable. Action (a) has not been revised with the proposed amendment.

The proposed changes must also be evaluated relative to possible rod misalignment, rod ejection and dropped rod scenarios. Power distribution, rod ejection and rod misalignment analyses are based on the arrangement of the shutdown and control rods. These proposed changes do not affect the rod sequence, insertion and power limits currently included in the Technical Specifications which ensures the core design limits are not exceeded and rod location is consistent with assumptions in the accident analyses. Specification 3.1.3.1 requires the rods to be maintained within ± 12 steps of their group step counter demand position. Maximum control rod misalignment directly affects core power distributions and assumptions of available shutdown margin and it is assumed as an initial condition in several accident analyses. If a misaligned rod is realigned within one hour the local xenon redistribution during this short interval will not be significant. However, this proposed amendment does not alter the allowed maximum rod misalignment of ± 12 steps and, therefore, there is no impact on any accident analysis assumptions.

To summarize, the proposed amendment would not involve a significant increase in the probability of an accident previously evaluated. Increasing the allowed outage time associated with multiple inoperable but trippable rods is acceptable since the safety function (reactor trip) remains unaffected. The proposed changes do not affect the initiating event of any accident and therefore do not affect the probability of occurrence of an accident. In addition, since the rods are verified trippable and, therefore, capable of performing their intended safety function the consequences of an accident previously evaluated is not increased. The conclusions in the Updated Final Safety Analysis Report remain valid.

2. This proposed amendment does not involve any physical changes to the rod control system or the reactor trip system. In addition, none of the operational limits such as bank overlap, rod insertion and rod alignment are being revised. There are no new failure modes or mechanisms associated with the proposed changes. The capability of the rods to shutdown the plant is not affected by the proposed change and the initiating assumption and results of the accident analyses are not impacted. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

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3. The proposed amendment adds an Action Requirement commensurate with the significance of the CRDS malfunction. With multiple rods inoperable, but trippable, they can still perform their intended safety function of insertion into the core to make the reactor subcritical upon receipt of a reactor trip signal. Operation in this condition is limited to 72 hours which should provide sufficient time for diagnosis and repair of the CRDS malfunction. Also, allowing the 72 hour interval where power operation may continue can avert an unnecessary transient on the plant that would otherwise be required by the shutdown. For the majority of cases where more than one rod is found to be inoperable but trippable, the malfunction can be traced to the Rod Control system. As previously stated the protection system is independent of the control system by design. Therefore, the proposed change does not involve a significant reduction in a margin of safety since the rods can still perform their intended safety function. The rods remain trippable and are available to ensure adequate shutdown margin. If multiple rods are inoperable and can not be verified to be trippable then continued power operation is not permitted and a unit shutdown is required. This requirement has not been changed in the Technical Specifications. In addition, the proposed amendment does not affect the radiological consequences or expected doses from any accidents and, therefore, does not adversely affect or endanger the health or safety of the general public. Action (c) provides increased operational flexibility but does not reduce any safety margin since the rods remain trippable.

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ATTACHMENT 4

ENVIRONMENTAL ASSESSMENT

Commonwealth Edison has evaluated the proposed amendment against the criteria for and identification of licensing and regulatory actions requiring environment assessment in accordance with 10CFR51.21. It has been determined that the proposed change meets the criteria for a categorical exclusion as provided for under 10CFR51.22(c)(9). This determination was based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10CFR50 and the amendment involves changes to the use of components located within the restricted area, and it involves no significant hazard considerations. As stated previously in the Evaluation of Significant Hazards Considerations, the amendment does not affect the radiological consequences or expected doses from any accidents. Therefore there are no changes in the type or amounts of effluents released off-site, and there is no significant increase in individual or cumulative occupational radiation exposure.

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