



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 48 TO FACILITY OPERATING LICENSE NO. NPF-37,  
AMENDMENT NO. 48 TO FACILITY OPERATING LICENSE NO. NPF-66,  
AMENDMENT NO. 37 TO FACILITY OPERATING LICENSE NO. NPF-72,  
AND AMENDMENT NO. 37 TO FACILITY OPERATING LICENSE NO. NPF-77  
COMMONWEALTH EDISON COMPANY  
BYRON STATION, UNIT NOS. 1 AND 2  
BRAIDWOOD STATION, UNIT NOS. 1 AND 2  
DOCKET NOS. STN 50-454, STN 50-455, STN 50-456 AND STN 50-457

1.0 INTRODUCTION

By application dated November 6, 1987, as supplemented by letters dated February 8, 1991, January 13 and February 6, 1992, Commonwealth Edison Company (CECO), the licensee for Byron Station, Units 1 and 2 and Braidwood Station, Units 1 and 2, proposed changes to the Technical Specification (TS) for the Stations. The proposed changes (TS Tables 3.3-6 and 4.3-3) pertain to the two outside air intake (to the control room) radiation monitors provided for each of the two trains of the control room ventilation system (CVS) for each Station. These monitors function to isolate the CVS outside air intakes in the event of a high radiation condition.

With a single radiation monitor in either CVS train inoperable, the current TS for the affected Station calls for terminating the normal mode of CVS operation and initiating the emergency mode of the system operation which, in turn, requires filtration of the intake air (into the control room) and return air (from the control room) through the charcoal adsorbers within one hour. The licensee's proposed TS changes allow continued plant operation with the CVS in its normal mode (i.e., filtration through high-efficiency particulate air (HEPA) filters only) in the event one or both of the monitors in the operating CVS train becomes inoperable, provided the redundant train (idle train) has both of its radiation monitors in an operable condition and the switchover to the redundant train is achieved within one hour of detection of inoperable monitor(s) in the operating train. Alternatively, the proposed change allows termination of the normal mode of CVS operation and initiation of the CVS in the emergency mode within one hour. Additionally, for either option, the proposed change calls for restoration of inoperable monitor(s) to operable status within 30 days or submittal of a special report to the NRC within the following 30 days explaining the cause of inoperability and the licensee's plans for restoring the inoperable monitor(s) to operable status.

## 2.0 EVALUATION

Each Station has its own control room and associated CVS which are common to both Units 1 and 2 of the applicable Station. The CVS has two full capacity trains located in separate rooms. Each CVS train is equipped with a physically diverse missile-protected outside air intake and two associated radiation monitors and a missile protected turbine building intake. The outside air intakes are at opposite ends of the Station auxiliary building. Normally, only one train operates and the other train is in a standby condition. During the normal mode of CVS operation, return air from the control room envelope and outside air drawn in through the outside air intake of the operating train mix in a mixing plenum, pass through HEPA filters, bypass charcoal adsorbers and is discharged into the control room. The outside air drawn through the intake pressurizes the control room. This minimizes infiltration of possibly contaminated outside air into the control room and provides the makeup for the air that gets exhausted from the control room. Upon detection of high radiation in the outside air intake by either monitor (a high radiation signal), the normally open outside air dampers close, thus terminating the normal mode of CVS operation. The normally closed dampers of the turbine building (TB) emergency air intake open up and the emergency makeup air filter unit starts. Additionally, the return air from the control room envelope and the make-up air (now from the TB intake) mix in the mixing plenum, pass through the HEPA filters and charcoal adsorbers and finally get discharged into the control room. The emergency makeup air filter unit consisting of an air heater, demister and pre-filters ensures optimum air conditions for the air entering the HEPA filters and charcoal adsorbers and is sized to handle the air flow required to pressurize the control room envelope to 0.125 inch water gauge positive pressure with respect to adjacent areas. Two radiation monitors are provided to monitor the discharge of the emergency makeup air filter unit. The isolation of the outside air intake and consequent termination of the normal mode and CVS train alignment into the emergency mode are all automatic. The automatic mode change for a CVS train occurs also upon a safety-injection (SI) signal or an operate failure signal from both operable radiation monitors of a train. However, with any of the above signals, while the operating train starts running in an emergency mode automatically, the standby train which also aligns into an emergency mode does not get started automatically (i.e., the fans in the standby train have to be manually started to operate the standby train in the emergency mode). Any CVS train can also be set into the emergency mode manually, through a control switch in the control room.

CECO provided its basis for the proposed TS change stating that the existing requirement is overly restrictive since it mandates placing the CVS in an emergency mode, even when only a single radiation monitor fails in any CVS train, and a full capacity redundant CVS train with both of its monitors in an operable condition, is available. CECO stated that the above requirement results in frequent flow through the charcoal adsorbers during normal plant operation. CECO contended that this needlessly degrades the charcoal's capability to adsorb radioiodine and so shortens the adsorber life with no added safety-benefit.

CECO pointed out that the proposed TS change to allow continued plant operation with the CVS in its normal mode, ensures sufficient redundancy in monitors in the redundant CVS train (to which the switchover is required when one or both monitors become inoperable in the operating CVS train), since the change requires both the monitors in the redundant CVS train to be operable. CECO further stated that the proposed TS change retains the existing requirement to place the CVS in the emergency mode of operation even if only a single monitor becomes inoperable in each train. Also, CECO discussed a limiting scenario of the plant operating with degraded monitoring on the idle CVS train with the occurrence of radioactive release and subsequent failure of the operating train. CECO pointed out that for the above scenario, the idle train could be manually started and the train would still have either a single radiation monitor available or would have been already aligned in the emergency mode per the system design. In a telephone conversation with the staff on March 23, 1992, CECO confirmed that if the idle train has degraded monitoring in the sense that both of its monitors are inoperable, then the system design would align the train into the emergency mode.

As discussed above, the staff notes that the CVS design for the Byron and Braidwood Stations incorporates plant-specific features in that one of the two turbine building intakes is used for drawing the makeup air during the emergency mode of CVS operation and that this switchover from outside air intake to the turbine building intake is automatic. However, the CVS can be aligned into the alternate emergency mode (i.e., filtration through charcoal adsorber; operation of the emergency makeup air filter unit) manually, and in this mode of operation, the makeup air is drawn through one of the outside air intakes (following a design basis loss-of-coolant accident (LOCA), this mode of operation will be used only after the reactor gets stabilized, i.e., during the recovery phase of LOCA). The operator does not have to rely solely on the outside air intake radiation monitors of the CVS for choosing the comparatively less radioactivity contaminated air intake, since meteorological instrumentation for wind direction provided for the affected Station will enable the operator to make the correct choice.

Based on the above discussion, the staff agrees with CECO that the proposed TS change will not alter the manner in which the actuation signal for emergency mode of system operation is provided and also will not have an impact on the response of the CVS to a valid actuation signal. The staff further concludes that the proposed change will not render the system vulnerable to any single failure which would preclude the accomplishment of the system's design safety function. The staff has determined that the proposed actions to restore the inoperable monitor(s) to operable status within 30 days of failing or submit a special report to the NRC within the following 30 days, provide an acceptable incentive to restore the inoperable monitors to operable status as soon as practicable.

The licensee's proposed change will also: (1) delete cycle-specific reliefs currently contained in TS 3/4.3.3.3.1 and the associated tables of Byron and Braidwood Station TSs, since these are no longer applicable, and (2) list the two trains and associated outside air intake monitors separately for

consistency with the other proposed TS changes identified above. The staff finds these changes acceptable.

Based on its review of the BASIS for the TS 3/4.3.3.1 (the proposed TS changes are for TS tables associated with the TS), the staff agrees with the licensee that the BASIS does not require any revision to reflect the proposed changes to the TS tables.

Based on the above review which includes consideration for provision of plant-specific features in the form of turbine building intakes besides the outdoor air intakes for the control room, the staff concludes that the proposed TS changes pertaining to the outside air intake radiation monitors provided for the CVS for each Station and the TS changes pertaining to cycle-specific relief identified in the licensee's February 6, 1992, submittal are acceptable and, therefore, should be granted.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (56 FR 11775 and 57 FR 9439). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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