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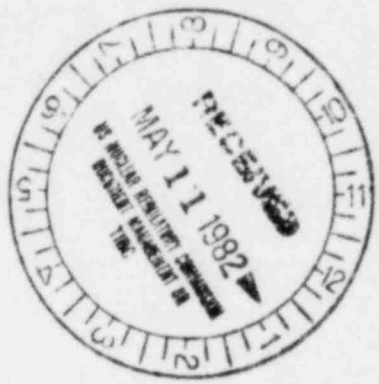

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Byron Station Units 1 and 2
Braidwood Station Units 1 and 2
Fire Protection
NRC Docket Nos. 50-454, 50-455,
50-456 and 50-457

Dear Mr. Denton:

This is to provide additional information regarding fire protection provisions at Byron and Braidwood Stations. NRC review of this information should help close Open Item 13 of the Byron SER.

The bases for our approaches to three different fire protection issues are discussed in Attachments A through C to this letter.

Attachment A describes the routing of hydrogen piping in the auxiliary building. The routing has been chosen to avoid areas containing safe shutdown equipment to minimize the fire hazard associated with a break of this line.

Attachment B describes gas and water systems designed to deal with fires in the cable spreading rooms. The equipment being installed provides the required potection with the minimum possibility of undesirable system interactions.

Attachment C explains why reactor coolant drip oil pans are unnecessary from a safety standpoint and undesirable from an ALARA standpoint.

It is suggested that we meet to review these issues further. A site meeting might be appropriate at this time. In this interim, please contact tnis office if additional information regarding these matters is required.

One signed original and fifteen copies of this letter are provided for your use.

Very truly yours,

T. R. Tramm

T. R. Tramm
Nuclear Licensing Adminstrator

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ATTACHMENT A

SER OPEN ITEM 13

FIRE PROTECTION - HYDROGEN PIPING

A one-inch diameter hydrogen pipe is routed from the station hydrogen system through the Auxiliary Building to the Volume Control Tank. This line provides a blanket of hydrogen above the reactor coolant in the Volume Control Tank to aid in oxygen control. This line is routed to avoid safe shutdown equipment, thereby eliminating a fire hazard.

The line enters the Auxiliary Building on the 401 foot level at about Column Row 11. Because of safe shutdown cables on this level, the pipe is routed down to the 393 foot elevation which does not contain safe shutdown equipment or cables in this area. The piping is routed along a valve aisle to the Q-line wall where it penetrates and is routed into a horizontal piping area and on to about Column Row 15. Again, no safe shutdown equipment or cables are in this area at this elevation. The pipe is then routed in a vertical pipe chase to the Volume Control Tank Room. The Volume Control Tank Room is enclosed by shield walls. The valves used for operation of the Volume Control System are located in an adjacent valve aisle. Therefore, a fire in the Volume Control Tank Room would not disable system operation. A short loop of the hydrogen piping containing the hydrogen control valves also extends into this valve aisle. The hydrogen pipe between the control valve and the Volume Control Tank is Category I piping. The remainder of the hydrogen pipe is Category II, but additional margin is incorporated into the design of the pipe and supports to protect against failure under seismic loads.

The Unit 2 piping is a continuation of the Unit 1 system which continues through the horizontal pipe chase to Column Row 21, where it follows a vertical pipe chase to the Unit 2 Volume Control Tank.

To conform with the Standard Review Plan, the hydrogen pipe has been routed through areas which do not contain safe shutdown equipment and portions of the system have been designated Safety Category I. The only location where the Category II portion of the system is near safe shutdown equipment is the above mentioned valve aisle. Because of the limited length and conservative design of this section of pipe, no fire hazard results.

ATTACHMENT B

SER OPEN ITEM 13

FIRE PROTECTION - CABLE SPREADING ROOMS

The Byron/Braidwood design includes several cable spreading rooms at elevations 439'-0" and 463'-4 1/2". The rooms are designed such that redundant safe shutdown cabling is routed through separate rooms and isolated by three hour fire barriers. The upper cable spreading rooms are protected by an automatic Halon 1301 system with a manual CO_2 backup system. Manual hose stations and portable extinguishers provide additional backup. The lower cable spreading areas are protected by an automatic CO_2 system. Backup is provided by manual hose stations and portable extinguishers. The Halon and CO_2 systems as installed at Byron/Braidwood meet the requirements of the governing codes NFPA 12 and NFPA 12A and, therefore, are acceptable to the insurers of the Byron/Braidwood stations.

The Regulatory Guide 1.120 position is that an automatic water suppression system should be installed in the cable spreading rooms. The Byron/Braidwood system provides adequate fire protection in the cable spreading rooms without an automatic water system. Water is available for use in the cable spreading rooms if required.

An automatic water suppression system was not installed in the cable rooms because of concerns about the probability and effects of inadvertent actuations. A cable fire would be expected to generate large quantities of smoke with relatively little heat. As a result, thermal detectors would not be a reliable detection system. Ionization detectors, as installed in these areas, will be very effective in detecting cable fires but could be expected to be subject to false alarms at some point in the plant operating lifetime. A deluge system which indiscriminately sprays a large area will result in a significant effort to restore the cable spreading room to normal conditions and could potentially cause other problems if water leaks into adjacent areas such as the control room which is below the upper cable spreading room, or the ESF switchgear room which is below the lower cable spreading room. Inadvertent actuation of a Halon or CO_2 system would have no adverse effects.

The probability of a fire in a cable spreading room is quite low. The main combustible material is cable insulation. The cables are covered with EPR or EPDM insulation with hypalon jackets. The cables have passed IEEE 383-1974 flame tests. In the event of a fire in a cable spreading room, spread of the fire would be prevented by three hour fire barriers. Disabling of one full cable spreading room would not prevent safe shutdown of the plant due to the redundancy and separation criteria used in design. The fire barrier construction insures a long residence time in the event of a Halon or CO_2 discharge.

In the unlikely event that water is required to quench hot areas after a fire, manual application of water using the nearby hose stations will provide localized control without the effects to

the general area which could result from actuation of a deluge system. As shown in the Byron/Braidwood Fire Protection Report, hose stations are located in each compartment of the upper and lower cable spreading areas. Hose stations are located adjacent to each doorway so that water availability will be guaranteed even if severe smoke conditions exist.

In summary, the Byron/Braidwood cable spreading area fire protection system design insures that a fire will not compromise plant safety. Use of automatic Halon or CO_2 systems instead of water deluge reduces the probability of a plant shutdown or equipment damage in the event of a spurious actuation. In the unlikely event that water is required, the area is well supplied with manual hose stations.

ATTACHMENT C

FIRE PROTECTION - RCP OIL FIRE

Reactor coolant pump oil drip pans are not being installed at Byron and Braidwood because they are unnecessary from a safety standpoint and undesirable from an ALARA standpoint. Significant oil leaks on these pumps are highly unlikely because of the care taken in the design, operation and maintenance of important pumps such as the reactor coolant pumps. If an oil leak should develop, it is not likely to ignite because the hot piping beneath the pump is insulated and good ventilation is provided in the pump area.

At Byron and Braidwood, the reactor coolant pump and the cold leg piping operate at about 525°F. The pipe and pump casing are insulated with stainless steel reflective insulation. The surface temperature of the insulation will not exceed 150°F. Seams are covered with metal flashings to minimize convective heat transfer within the reflective insulation. This seal will also keep oil out of the insulation away from the hot piping. With this protection in place, leaking oil should not ignite. It will be collected in a floor sump and pumped to a tank in the auxiliary building for processing with other potentially radioactive waste streams.

To provide assurance that these is no safety hazard associated with an oil fire, an analysis has been completed assuming that the oil in a reactor coolant pump is ignited and all 275 gallons burns. The oil is assumed to burn at a rate of 6.5 gal/min. The resulting maximum containment temperature (290°F) is lower than the temperature predicted after a main steam line break and is, therefore, within the design basis and the equipment qualification envelope. The only cable near the pumps, other than the cable to the reactor coolant pump itself, is routed on the walls near the pumps. These cables are a minimum of two feet from the outside surface of the pump and are enclosed in conduit or risers. There are no cables directly over the reactor coolant pump.

The addition of drip pans is not only considered unnecessary, but would also be detrimental to the goal of reducing personnel exposure to As Low As Reasonable Achievable. The maintenance experience at the Zion units indicates that drip pan removal is a significant contributor to personnel exposure. A four-man crew spends about six hours removing the pans on a single pump. Reinstallation also requires six hours. The radiation level in this area is about 50 mrem/hr. Therefore, 48 manhours or 2.4 rem results from drip pan maintenance on one pump during each outage. Since all four pumps are normally inspected and maintained, the drip pans are the cause of nearly 10 man-rem per unit per year. There are design changes which could be made to reduce this exposure, but the reduction is not expected to be significant.