Enclosure to
ULNRC-06764
September 1, 2022

Updated Response to RAI HFE-1

2 pages

On June 2, 2022, an NRC request for information (RAI) letter was transmitted to Ameren Missouri in regard to its license amendment request (LAR) for incorporating the alternative source term (AST) dose analysis methodology into the Callaway licensing basis. Ameren Missouri provided its response to the RAI letter via letter ULNRC-06754, dated July 5, 2022. The response included, in particular, Ameren Missouri's response to RAI No. 3 (RAI HFE-1) from the NRC's letter. That response discussed credit for a timed manual operator action to actuate the Emergency Exhaust system (EES) following a fuel handling accident in the containment building. The complete response wording is copied below.

> *Ameren Response: Fuel Handling Accident in the reactor containment building*
>
> *Table 3-58 of ULNRC-06636 Enclosure I documents credit for operator action to initiate the Emergency Exhaust system within 10 minutes of accident initiation. Manual actuation of the Emergency Exhaust system is performed from the Control Room as directed by the current fuel handling accident response procedure, OTO-KE-00001.*
>
> *This action was previously implemented in the procedure although it has not been previously credited in Callaway's radiological dose analysis of the Fuel Handling Accident. The 10-minute requirement for completion of the action will be added to Callaway's Significant Operator Response Timing program as a Time Critical Action (TCA) upon implementation of the AST License Amendment. Inclusion as a TCA ensures that the action and action timing are trained on by the operators and periodically validated.*
>
> *All other operator actions credited to mitigate a radiological dose event are consistent with the Analyses of Record for Callaway. No other changes to operator actions, timing requirements, or emergency operating procedures are required as part of AST implementation.*

Ameren Missouri has given further consideration to the above response. Specifically, upon further review of the supporting calculation performed for the fuel handling accident in the reactor containment building (FHA-RCB), it has been determined that operation of the Emergency Exhaust system (EES) is not required to mitigate the consequences of the limiting accident scenario, and therefore, there is no need to credit any operator action to actuate the EES. Discussion of EES actuation should not have been included in the response to RAI HFE-1, nor in Enclosure 1, Table 3-58 of the initial AST License Amendment Request (LAR) submitted under ULNRC-06636.

Credit for EES actuation was initially considered in order to reduce the potential for unfiltered inleakage into the control room equipment rooms from the auxiliary building (AB) in the unlikely event that high wind conditions pressurize the control building through the open equipment hatch and transport activity from the damaged fuel through the open containment personnel hatch, into the auxiliary building hallways, and then into the control room equipment room envelope boundary. EES operation in this scenario would provide a defense-in-depth mechanism to lower AB pressure and transfer any activity entering the AB to the atmosphere. However, as described below, this postulated scenario is neither credible nor limiting with respect to dose received by the control room operators.

It is neither credible nor is it required in Regulatory Guide 1.183 to postulate sustained high winds in the precise orientation required to pressurize containment for any significant duration. Further, and despite that understanding, administrative procedures are in place to close the containment equipment hatch and/or suspend fuel movement if severe weather conditions are present or predicted by the National Weather Service, as indicated by a High Wind Warning, Thunderstorm Watch or Thunderstorm Warning.

Besides the above, it may also be noted that per the plant's fuel handling accident analysis, there is no overpressure in containment directly resulting from the accident. However, if some degree of containment pressurization were to be postulated, it would not represent a limiting scenario for the FHA-RCB analysis. With the normal, non-safety, AB ventilation system in service, its exhaust is directed up the plant stack and thus would direct activity to the atmosphere. With the normal ventilation not operating, conditions are relatively stagnant in the AB, surrounding containment, on elevation 2047'-6" from the Personnel Hatch Area at 207 degrees, and in the control room equipment rooms 1501 and 1512 at approximately 300 degrees. Activity entering the AB from containment would diffuse throughout the AB before reaching the control room equipment room boundary.

In contrast, the equipment rooms and control room will be pressurized within two minutes of event initiation. A control room ventilation isolation signal (CRVIS) is generated from high radiation detected by monitors at the normal ventilation inlet/intake. Since the analysis assumes no delay in the release of activity and no delays in the transport of activity through the primary and secondary systems or in the transport from the release point to the air intake, the activity concentration at the control room ventilation detector immediately following event initiation (i.e., at 3 seconds) is 9.65E-2 μCi/cc Xe-133. The analysis models a detector setpoint of 2.2E-3 μCi/cc Xe-133, which is an order of magnitude lower than the calculated activity concentration. Therefore, an instantaneous generation of the high radiation signal could be assumed. For conservatism, control room isolation is assumed to occur 120 seconds after event initiation; a 60-second delay is allowed for the detector to reach its setpoint, and an additional 60 seconds is allowed for control room isolation once the setpoint has been reached. Control room isolation and pressurization effectively eliminate any meaningful leakage from the AB into the control room/equipment room envelope.

In summary, with doors and a long winding leakage pathway through the AB to the control room/equipment room envelope, direct (indoor) diffusion over the first two minutes, prior to control room isolation, is not limiting relative to the competing case of unfiltered inleakage to the control room from the outside atmosphere. Activity transported through the containment personnel hatch, into the AB, does not represent a credible or limiting analysis scenario. While EES operation is a potentially appropriate defense-in-depth consideration, it is not credited or required to mitigate the consequences of a design basis fuel handling accident in containment. Therefore, there is no need to credit any operator action to actuate the EES.