

NRCExecSec Resource

From: Richard Andrews <dick0645@yahoo.com>
Sent: Saturday, January 17, 2015 7:43 PM
To: NRCExecSec Resource
Cc: Dave Lochbaum
Subject: Ice Jams on the Missouri River Downstream of the Fort Calhoun Station May Cause Rapid Flooding at the Site

Dear Mr. Secretary.

I am not sure who to send this to now as the licensing project manager assigned to the Fort Calhoun has changed. Would you please help me get it to the right party?
Richard Andrews

Winter weather can cause problems for power plants located along the Missouri River. I found two instances where ice jams caused rapid upstream flooding on the Missouri River and on the Little Missouri River. Excerpts from articles on the flooding are included at the end of this email.

Last August the owner of the Fort Calhoun Nuclear Station responded to a number of questions from the NRC regarding License Amendment Request (LAR)13-03, Revising Method for Controlling Raw Water Intake Cell Level. The OPPD letter (LIC-14-0092) contained OPPD's response to those questions.

Pivotal to OPPD's response is that they claim to have two days to respond to potential flooding on the Missouri River. This is because considerable time is required for corrective action in case all six sluice gates in the intake structure at the plant cannot be completely closed. All gates must be fully closed and leak tight so that raw water intake cell water level can be properly controlled. If cell level cannot be controlled an entire safety system, the Raw Water System, will be rendered inoperable by flood waters. I have no doubt that under normal weather conditions flooding on the Missouri River can be predicted and two days warning time seems proper. However, in the event of ice jams downstream of the plant on the Missouri River, very little time may be available to implement a large array of procedural actions let alone corrective actions in the event any one of six sluice gates fails to close completely due to ice, sand, silt etc. Please consider this possibility as you review this license amendment. Furthermore, the current design of the plant is such that five sluice gates must be completely closed and the sixth gate throttled to within one inch of its seat to control intake structure cell level. Also the current design and the proposed modification associated with the LAR do not meet the General Design Criteria associated with a single active failure in that the failure of just one of six sluice gates will render an entire safety system inoperable. I strongly feel the plant should not be operated in noncompliance with the GDC. It is particularly important that the plant not be operated if ice jams can reasonably be expected to form on the river. We are into the winter season and both of the events below occurred during the month of March.

Your prompt attention to this matter would be much appreciated.

Sincerely,
Richard Andrews

Excerpt from USA Today March 25, 2009
Evacuation ordered near Missouri River in Bismarck

"The Army Corps of Engineers cut off water releases Tuesday from North Dakota's Garrison Dam — a historic move to ease flooding along the Missouri River in Bismarck. The city ordered the evacuation of homes along the river where access roads were under water in the middle of a spring blizzard. The river stage in Bismarck has jumped 2 feet since Monday to more than 15 feet, less than half a foot below flood stage, due to ice jams. Releases from Garrison Dam were first cut to a record-low 4,000 cubic feet per second and then ended altogether."

Excerpt from The Bismark Tribune March 13, 2014...
Ice jams causing trouble on lower Little Missouri River

"Ice jamming on the Little Missouri River north of Marmarth is causing trouble for at least one ranch family who lost corrals and livestock this week. Nikki and John Brown, who ranch on the west side of the river between Marmarth and Golva, had two heifers drown and some property destroyed when the river came up during the early morning hours Wednesday. Nikki Brown said the river was higher on their property than it was in either the flood of 2009 and 2011, due to a miles-long ice jam downriver. She said the jam finally broke loose Thursday afternoon."

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From: Richard Andrews <dick0645@yahoo.com>
Sent: Monday, January 19, 2015 2:57 AM
To: NRCExecSec Resource
Subject: Fort Calhoun Nuclear Station

Further comment on OPPD's (Fort Calhoun Nuclear Station) response to the NRC on potential flooding on the Missouri River contained in its submittal to the NRC dated August 13, 2014.

OPPD indicates in its response to the NRC that during cold weather the "typical time to cool down is approximately 3 hours". Of course this reactor cool down time is predicated on the availability of the systems necessary to achieve that cool down. In the utility's response this reactor cool down can be conducted well before flood waters adversely affect the site. OPPD in fact estimates that up to 2 days time is available as flood predictions will allow for such lead time. However, and as indicated before, a rapid flooding event on the Missouri River caused by an ice jam downstream of the site during cold weather, will allow for very little if any lead time. Lack of lead time will make it impossible for plant operators to take demanding and time-consuming corrective actions to protect the plant from rapidly losing an entire safety system, the so-called Raw Water System (RWS).

Under these conditions can the Fort Calhoun Nuclear Station be cooled down within 3 hours?

Furthermore, and even more importantly, even if a cold shutdown can be achieved in a timely manner, how can a cold shutdown condition be maintained as the RWS acts as the reactor's ultimate heat sink?

Without the RWS available (as all four RW pumps are submerged by flood waters) how long until reactor fuel damage occurs due to the complete loss of the ability to remove decay heat from the reactor core?

The simple fact is that no matter how fast the reactor is cooled down, decay heat must be removed indefinitely from the fuel not only in the reactor itself but all the used fuel stored in the plant's on-site spent fuel pool. How is this critical function to be accomplished with the RWS totally inoperable and with no means available to ever restore it?!

It is high time to not only ensure that this plant is not operated when river conditions could result in ice jams on the Missouri River, but also to ensure that the plant has a proper modification to bring it into compliance with its operating license and the NRC General Design Criteria. Currently if a single active failure occurs (one of six sluice gates fails) a complete loss of a safety system may result due to a flood at the plant.

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From: Richard Andrews <dick0645@yahoo.com>
Sent: Tuesday, January 20, 2015 2:31 AM
To: NRCExecSec Resource
Subject: Fort Calhoun Flooding-supplemental information

Missouri River Flooding-supplemental information

Almost two months after the Fort Calhoun Station (FCS) was shutdown in early 2011, and as a result of a special NRC team inspection, the NRC calculated that if the ability to cool the nuclear fuel at the site were lost it would take 37 hours for boiling to occur in the reactor and 80 hours for boiling to occur in the plant's spent fuel pool. As decay heat generation drops off exponentially after the reactor is shutdown, it is scary to think how little time it would take for boiling to occur in the reactor at FCS if the plant were just shutdown due to flooding on the Missouri River and a loss of cooling occurred?! Boiling of course can then lead to nuclear fuel damage; steam-cladding interaction leading to hydrogen generation; melting; and even vaporization of the core. It is high time to stop cutting it close on nuclear and public safety at this nuclear power plant.

Richard Andrews