

BOYCE HYDRO POWER LLC

A W.D. Boyce Trusts Legacy Enterprise

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2 July, 2020

P-2785 Sanford
P-10809 Secord
P-10810 Smallwood

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20246

RE: Emergency Response and Forensic Investigation for Boyce Hydro Dam Incidents

Secretary Bose: The purpose of this letter is to obtain clarification regarding the scope of the forensic analysis required by the May 20, 2020 letter to Boyce Hydro Power, LLC (BHP) from Mr. David Capka, Director of the Federal Energy Regulatory Commission's (FERC) Division of Dam Safety and Inspections (May 20 Letter). The May 20 Letter was in response to the recent extreme flooding event which resulted in breach of BHP's non-FERC regulated Edenville Dam, which in turn resulted in the subsequent overtopping and breach of the Sanford Dam.

The May 20 Letter required BHP to fully lower the reservoirs behind the Sanford Dam, Smallwood Dam, and Secord Dam, perform a dam safety inspection of all three dams, and provide an inspection report of the safety condition of the dams to FERC's Chicago Regional Office. The May 20 Letter also stated that BHP must maintain fully lowered reservoirs until safe reservoir elevations could be established and implemented. Due to the Sanford Dam breach, the Sanford reservoir has been fully lowered and the remaining civil structures of the dam no longer impound the river which now flows around these structures in a run of river mode. BHP complied with the requirement to fully lower the Smallwood and Secord reservoirs and has inspected both dams. On 30 June, 2020, BHP submitted its engineer's Smallwood Dam inspection report to the Chicago Regional Office. On 3 July, 2020, BHP will submit its Secord Dam engineer's report to the Chicago Regional Office. Each report contains recommendations for repairs some of which were identical to recommendations previously made in the latest Independent Consultant Safety Inspection Reports.

The Smallwood Dam inspection report recommended reconstruction of the missing section of the original concrete spillway structure's left tailrace retaining wall for immediate action. Additionally, a dive inspection of the upstream submerged portions of the spillway and powerhouse structure was recommended, as well as a recommendation to close the spillway gates for a sufficient period of time to allow the tailrace water levels to subside so that the tailrace slab and the lower sections of the side retaining walls can be visually inspected. Once these items are accomplished, and assuming there are no structural defects found requiring additional immediate attention, the Smallwood Dam should be permitted to resume normal operations at restored impoundment levels.

The report for the Secord Dam recommended for immediate action restoring the original physical integrity of the concrete spillway right side retaining wall where erosion has propagated a hole through the concrete in a section of wall at its base below the normal water line. This was actually an item identified in a prior CSIR and the 2018 Focused Spillway Inspection Report. While there were additional recommendations for concrete repairs, primarily to concrete beams and struts, they were not designated for "immediate" action and should not be cause for delaying the resumption of normal operations at the fully restore reservoir levels.

The report for the Sanford Dam did not make any repair recommendations because the earthen section of the dam has been eliminated and washed away. The dam effectively no longer impounds a reservoir, and BHP has no immediate plans to rebuild the dam. The remaining civil structures, powerhouse and spillway with six tainter gates are still intact, and previously noted erosion at the periphery of the powerhouse has already been mitigated.

With respect to the Smallwood and Secord Dams, and the TRC engineering recommendations for repairs to be made to these two facilities in the near term before resumption of normal operations, BHP proposes to submit construction repair plans to FERC on or before July 16th with the expectation that they will be reviewed by FERC on an expedited basis. The relatively simple construction repairs can therefore be completed by mid-August. Once completed, the Smallwood and Secord projects should be placed in operation once again, at the license-ordered reservoir levels, starting in the third week of August.

The May 20 Letter also required BHP to form an Independent Forensic Investigation Team to focus on the three FERC-licensed dams. As stated in the May 20 Letter, the Team's scope of work is to include:

1. reviewing project operations before, during, and after the event, including activation and effectiveness of Emergency Action Plans, and spillway operations; performing field investigations;
2. reviewing project documents including the Emergency Action Plans, Potential Failure Mode Analyses, Part 12D Independent Consultant Inspection Reports, the Owner's Dam Safety Program and Supporting Technical Information Documents;
3. developing any additional information or analyses deemed appropriate by the Team; and
4. preparing and submitting a Forensic Analysis Report which discusses the "*root cause*" of the overtopping damage to Sanford Dam as well as "*any other contributing causes.*"

BHP has formed the required Forensic Investigation Team, which FERC has approved, but has received several questions from the Team regarding the appropriate scope of their investigation. First, the May 20 Letter, although acknowledging that the Edenville Dam is no longer under FERC jurisdiction, states FERC will be "*reaching out*" to the Michigan dam safety agency "*regarding coordination for investigation of the Edenville breach.*" Please confirm that the scope

of the Team's forensic analysis for purposes of complying with FERC's May 20 Letter does not include the cause or causes of the Edenville Dam breach given the fact that FERC does not regulate that former dam as of September, 2018.

Second, BHP requests that you clarify that the scope of the Team's forensic analysis of the Sanford Dam overtopping and breach includes the Smallwood and Secord Dams and their operations *only to the extent of determining whether they were contributing causes to the Sanford Dam breach*. Please note the American Society of Civil Engineers defines "forensic engineering", i.e. the task assigned to the Boyce-assembled forensic investigation engineering team, as "*The application of engineering principles to the investigation of failures or other performance problems.*"¹

Given the ASCE's engineering community's definitional understanding of the constituent components of "forensic investigation", and given the fact that the Smallwood and Secord Dams did not sustain a "*failure or other performance problems*", as they were not breached, were not severely damaged by the flooding, are demonstrably capable of continued operation subject to minor repairs as they have undergone safety inspections by BHP's Dam safety engineer, as discussed above, the FERC mandate for "*forensic investigation*" of these two dams does not appear to be applicable to or consistent with the ASCE's definition of the circumstances that warrant the FERC ordered investigation.

Moreover, members of the forensic investigation team have expressed concerns about the appropriateness and rationale of conducting a full-blown dam safety analysis of dams which did not fail or experience significant problems. BHP does not dispute that it is appropriate for the Team to examine the upstream dams for the more limited purpose of determining whether the operations of those dams during the event contributed to the failure of Edenville Dam (e.g., the time sequence of spillway gate operations at the four projects).

Finally, with respect to the root cause of the failure of the Sanford Dam, BHP notes that the Sanford Dam was and has been in compliance with FERC's Probable Maximum Flood requirements as of 2002 when the prior licensee constructed an emergency fuse plug spillway in the earthen embankment of the Sanford Dam. On May 19th the fuse plug's erodible material activated as intended effectuating a controlled release of the initial flood wave from the Edenville Dam breach. However, as has been well understood by FERC that the Investigation and Analysis of Dam Break Floods prepared for the formerly-licensed Edenville Dam by Ayers Engineering in 2014, which is included in both the Edenville and Sanford Emergency Action Plans, states the following: "*[T]he spillway capacity would not be enough to prevent overtopping during a PMF (with or without Edenville failure) or during the fair-weather flood wave from Edenville.*" The EAP itself states: "*This 2014 dam break analysis is of a failure of the upstream Edenville Dam. A failure at Edenville would overtop the Sanford Dam and cause its failure. This would result in the largest possible failure flood downstream of Sanford and so was used for this Emergency Action Plan.*"

¹ ASCE website <https://www.asce.org/forensic-engineering/forensic-engineering/>

Secretary Bose

2 July, 2020

Page 4 of 4

Thus, without in any way attempting to prejudge the outcome of the Team's forensic analysis, BHP believes that it is fairly evident that the root cause of the Sanford Dam failure was the Edenville Dam failure.

In order to facilitate the Team's focus on the appropriate contractual scope of the ordered investigation, BHP respectfully requests your prompt response to this letter.

Sincerely yours,

A handwritten signature in black ink that reads "Lee W. Mueller". The signature is written in a cursive style and is positioned above a horizontal line.

Lee W. Mueller, Member Manager
Boyce Hydro Power, LLC

CC: John Zygaj
Mike Swiger