



PUBLIC UTILITY DISTRICT NO. 1 of CHELAN COUNTY
P.O. Box 1231, Wenatchee, WA 98807-1231 • 327 N. Wenatchee Ave., Wenatchee, WA 98801
(509) 663-8121 • Toll free 1-888-663-8121 • www.chelanpud.org

June 16, 2011

VIA ELECTRONIC FILING

Honorable Kimberly D. Bose, Secretary
Nathaniel J. Davis, Sr., Deputy Secretary
FEDERAL ENERGY REGULATORY COMMISSION
888 First Street, NE
Washington, DC 20426

RE: Lake Chelan Hydroelectric Project No. 637 (Project)
Report on Minimum Flow and Ramping Rate Deviation for Chelan River

Dear Secretary Bose and Deputy Secretary Davis:

This letter is to provide you with Public Utility District No. 1 of Chelan County's (Chelan PUD) follow-up report on instream flow and ramping rate deviations that occurred during May 15 and May 17 on the Chelan River. These deviations were reported by email to the Federal Energy Regulatory Commission (FERC) Portland Office and Washington Department of Ecology (Ecology) Central Regional Office on May 19, 2011.

Summary

The Low Level Outlet was believed to be isolated from the automated control system and under manual operation since a deviation that happened on April 18, 2011. However, a secondary automation pathway partially closed the Low Level Outlet on May 15, reducing flows below minimum levels from 320 cfs to 285 cfs for about one hour. A second incident, lasting about three hours, occurred on May 17 due to inaccurate flow readings and operator actions taken when they were attempting to repair gate level indicators at the Low Level Outlet. The second event resulted in flows decreasing to approximately 250 cfs before the flow meter readings were determined to be inaccurate. Both events also resulted in deviations from ramping rates in the Reach 4 habitat channel. No adverse biological effects were observed to result from these events.

License Requirement

Article 405 requires Chelan PUD to implement the instream flows, ramping rates, and tailrace flows as set forth in Article 7 of the Lake Chelan Settlement Agreement and Chapter 7 of the Comprehensive Plan attached to the settlement agreement. The specific flow requirement that is the subject of this deviation report is to maintain a minimum flow of 320 cfs into Reaches 1-4 of the Chelan River from May 15 – July 15 during high runoff years.

In accordance with FERC's Order Modifying and Approving Operations Compliance and Monitoring Plan, Article 405, issued November 30, 2007, when a flow deviation occurs, Chelan PUD is required to notify FERC and Ecology of the deviation within 48 hours of the time that Chelan PUD became aware of the deviation. FERC and Ecology were notified via electronic submittal on May 19, 2011. Following the initial notification, Chelan PUD is required to file a report, as follows:

“The licensee shall file a report with the Commission within 30 days of any deviation from minimum flow requirements, lake levels or ramping rates. The report shall, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report shall also include: 1) operational data necessary to determine compliance with the respective license requirements regarding minimum flows, lake levels, and ramping rates, as appropriate; 2) a description of any corrective measures implemented at the time of occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and 3) comments or correspondence, if any, received from the resource agencies and others regarding the incident.”

Record of Chelan River Flows

Minimum flows of 320 cfs throughout the Chelan River were effective May 15, as required for high runoff years. This flow level was being provided by the Low Level Outlet. The forebay elevation of Lake Chelan was below the spillway crest, thus only the Low Level Outlet was available to provide the flow at the time of these deviations. Except for the one hour and three hour periods affected by these incidents, the Chelan River (Reaches 1-4) minimum flow requirement of 320 cfs has been met or exceeded since initiation on May 15.

Cause of the Deviation

The May 15 incident resulted in a flow reduction below 320 cfs for a period of one hour, with the flow briefly dipping to approximately 285 cfs at 30 minutes following the beginning of the event. Water levels in Reach 4 of the Chelan River decreased by 3 inches over a 30 minute time period. Ramping rates of 2 inches per hour are currently in effect pending biological studies to establish site-specific and seasonal presence of small juvenile fish that are the focus of these stringent ramping rates.

The second incident resulted in a flow reduction lasting for approximately 3 hours, with a water level decrease of 4 inches in the first hour and about 2.5 inches during the second hour. The second incident was caused by a malfunction of the Low Level Outlet flow meter. Based on the subsequent reduction in water levels in Reach 4, the flow from the Low Level Outlet likely reached a minimum of about 250 cfs. The Low Level Outlet was operated to maintain Reach 4

water levels at the elevations recorded when flow releases ranged from 330-340 cfs until the flow meter was returned to service.

The deviation on May 15 began around 9:00 pm on Sunday. The Low Level Outlet control system, which was thought to be locked out to prevent automatic gate movements, lowered one of the gates, although no commands had been given to move the gate. The partial gate closure was initiated by a second programmable logic controller (PLC) that was linked to the slide gate operating motors through a different logic path than the main control PLC that had been locked out in response to the April 18, 2011, deviation (see report filed May 19, 2011). A larger deviation from ramping rates in the Reach 4 habitat channel was prevented by operating one of the pumps in Reach 4 to supplement flows as the dip in Low Level Outlet flows arrived at Reach 4. Since this incident, the Low Level Outlet gates have been disconnected from the motors and operated manually to prevent any further deviations caused by the automated control system.

The second incident on May 17 took place when Project personnel were attempting to repair the Low Level Outlet gate position indicators, which were giving incorrect output. When the PLC was rebooted, the Low Level Outlet flow meter also rebooted and began to indicate that Low Level Outlet flow was exceeding 500 cfs. Plant personnel partially closed the Low Level Outlet gates based on this flow meter information, which proved to be false. Subsequently, when water levels began to decrease in Reach 4, personnel reset the Low Level Outlet slide gates to a previous setting to restore water levels in Reach 4 to those observed when flows were known to be near 330 cfs. The Low Level Outlet is currently disengaged from the PLCs and operating motors to prevent further issues. The Low Level Outlet slide gates were manually adjusted as needed to maintain water levels in Reach 4 that are known to occur at flows between 330-350 cfs while the flow meter was out of service.

The flow meter was returned to service on May 24, but the Low Level Outlet remains on manual control. On May 30, the forebay elevation of Lake Chelan had increased to the point that the spillway could provide additional flow. Both the spillway and Low Level Outlet have been in operation since that time and flow in the Chelan River has met or exceeded minimum flow requirements since May 17.

Biological and/or Environmental Impacts:

The reduced flows and ramping rate deviations were short term. Chinook fry that were observed in Reach 4 during surveys conducted May 10 and May 18 were seen to be rearing in shoreline areas with water depths greater than 6 inches. No fish stranding or other adverse ecological effects were observed to result from these flow and ramping rate deviations.

Corrective Measures

The Low Level Outlet has been maintained on manual operation, with the gate motors disconnected from the automated control system since May 15. The Low Level Outlet does not require frequent adjustments, therefore manual operation is sufficient to meet all minimum flow and ramping rate requirements. The deviations on April 18, May 15 and May 17, 2011, each involved separate components of the automated control system, thus the causes of each incident were distinct. With the motors disconnected from the control system, the gates will not operate without human intervention. The Low Level Outlet will remain in manual, with the automated system disconnected, until the control logic has been revised to allow remote manual operation.

*Ms. Kimberly D. Bose and Mr. Nathaniel J. Davis, Sr.
Federal Energy Regulatory Commission*

Conclusion

The May 15, 2011, deviation from Chelan River minimum flows and ramping rates was caused by a problem with the automated control system logic. The May 17, 2011, deviation was caused by a flow meter malfunction and manual operations as a result of incorrect flow meter information. The brief nature of these water level declines and rapid restoration of flows likely prevented any adverse effects on aquatic life. Minimum flow and ramping rate requirements have been maintained since the incidents by disconnecting the gate motors from the automated control system and manual operation of the Low Level Outlet. The Low Level Outlet will remain in manual, with the automated system disconnected, until the control logic has been revised to allow remote manual operation.

If you have any questions regarding this event, please contact me or Steven Hays at (509) 661-4181.

Sincerely,



Michelle Smith,
Licensing & Compliance Manager
(509) 661-4180
michelle.smith@chelanpud.org

Enclosure: E-mail correspondence with the agencies

cc: Washington Department of Ecology
Chelan River Fishery Forum

Sokolowski, Rosana

From: Hays, Steve
Sent: Thursday, May 19, 2011 5:14 PM
To: 'patrick.regan@ferc.gov'; 'erich.gaedeke@ferc.gov'; 'pirl461@ecy.wa.gov'; 'Charlie McKinney (cmck461@ECY.WA.GOV)'
Cc: Smith, Michelle; Truscott, Keith; Osborn, Jeff; Sokolowski, Rosana; Lucas, Douglas; Campbell, Rob
Subject: Lake Chelan Project No. 637 Minimum Flow and Ramping Rate Deviation

Follow Up Flag: Follow up
Due By: Thursday, June 16, 2011 8:00 AM
Flag Status: Flagged

This email is to provide you notification regarding two minimum flow and ramping rate deviations, which occurred in the Chelan River on May 15 and May 17, 2011. A detailed report will be filed within 30 days.

Minimum flows of 320 cfs were effective May 15, as required for high runoff years. The May 15 incident resulted in a flow reduction below 320 cfs for a period of one hour, with the flow briefly dipping to approximately 285 cfs at 30 minutes following the beginning of the event. Water levels in Reach 4 of the Chelan River decreased by 3 inches over a 30 minute time period. The second incident resulted in a flow reduction lasting for approximately 3 hours, with a water level decrease of 4 inches in the first hour and about 2.5 inches during the second hour. The second incident was caused by a malfunction of the Low Level Outlet flow meter, which remains out of service. Based on the subsequent reduction in water levels in Reach 4, the flow from the Low Level Outlet likely reached a minimum of about 250 cfs. Since malfunction of the flow meter, the Low Level Outlet has been operated to maintain Reach 4 water levels at the elevations recorded when flow releases ranged from 330-340 cfs.

The first deviation on May 15 began around 9:00 on a Sunday evening. The Low Level Outlet, which was thought to be isolated for manual control, partially closed one of the gates although no commands had been given to move the gate. The cause of this incident has not been fully determined, but apparently there were more than one programmable logic controllers (PLCs) connected to the slide gate operating motors. Since this incident, the Low Level Outlet gates have been disconnected from the motors to prevent a recurrence of this problem. A larger deviation from ramping rates was prevented by operating one of the pumps in Reach 4 to supplement flows as the dip in Low Level Outlet flows arrived at Reach 4.

The second incident on May 17 took place when Project personnel were attempting to repair the Low Level Outlet gate position indicators, which were giving incorrect output. When the PLC was rebooted, the Low Level Outlet flow meter also rebooted and began to indicate that Low Level Outlet flow was exceeding 500 cfs. Plant personnel partially closed the Low Level Outlet gates based on this flow meter information, which proved to be false. Subsequently, when water levels began to decrease in Reach 4, personnel reset the Low Level Outlet slide gates to a previous setting to restore water levels in Reach 4 to those observed when flows were known to be near 330 cfs. The Low Level Outlet is currently disengaged from the PLCs and operating motors to prevent further issues. The Low Level Outlet slide gates are being manually adjusted as needed to maintain water levels in Reach 4 that are known to occur at flows between 330-350 cfs.

The reduced flows and ramping rate deviations were short term and Chinook fry observed in Reach 4 during surveys conducted May 10 and May 18 were inhabiting shoreline areas with water depths greater than 6 inches. No fish stranding or other adverse ecological effects were observed to result from these flow and ramping rate deviations.

If you have any questions or require additional information, please contact Steven Hays at (509)661-4181.

Thank you

Steven Hays

Steven Hays
Fish and Wildlife Senior Advisor
steve.hays@chelanpud.org
(509) 661-4181

Document Content(s)

37046 LC Deviation Report.PDF.....1-6