

HIGHLIGHTS OF ACCOMPLISHMENTS FOR 2023

Dams Management Department (DMD)

I. DAMS, RESERVOIRS AND WATERWAYS DIVISION

1. Dam Safety Inspection/Assessment

The dam safety inspection/assessment is implemented semi-annually to ensure the safety/integrity and operability of the structures to impound water needed for domestic water supply, irrigation, power generation and flood control. This includes dam instrumentation monitoring/surveillance to gather technical data which are used for structural safety evaluation and as basis for decision making. The observations, findings and recommendations are reported to the concerned Plant Management/Operators, and compliance with the recommendations is diligently monitored.

Safety inspections of five (5) NPC managed and operated dams in Luzon namely Ambuklao, Binga, San Roque, Angat, and Caliraya-Lumot Dams and their appurtenant structures were conducted to assess their behavior and condition. DRWD also participated in the conduct of annual safety inspection/assessment of PSALM privatized small hydroelectric plants namely: Amlan in Negros Oriental, and Loboc in Bohol in the first semester and Buhi-Barit in Camarines Sur and Cawayan in Sorsogon, during the second semester. Inspection of the non-power components of Balongbong HEP as well as the investigation of the reported landslide along the penstock route was also conducted in January of the same year.

2. Deformation Survey of Caliraya and Lumot Dams and Dykes

Deformation surveys are conducted semi-annually to check structural displacements. The first survey was conducted on June 21-23, 2023, and the second survey was done on November 20-23, 2023.

The deformation survey results gathered from February 2012 to November 2023 of Caliraya and Lumot Dams and Dykes showed small (acceptable) movements/displacements along XYZ directions, and results of the distribution analysis particularly in the standard deviation are all within the threshold of less than 0.1. The results indicated no anomalies/abnormalities in the measurement of Movement Survey Monuments (MSMs) and we can therefore conclude that the structures are in stable condition.

3. Rim Mapping of Angat and Caliraya Reservoirs

Rim mapping aims to: (1) locate mass movement/landslide susceptible zones and (2) detect possible indications of slope instabilities that may generate impulse waves within the dam reservoirs. The report presents the status/conditions of the reservoir rim.

Rim mapping in Angat Reservoirs was conducted on August 10, 2023, while in Caliraya Reservoir it was done on November 24, 2023. Results of the rim mapping showed that slope instabilities are mostly shallow and localized. The instabilities were observed to occur in areas with loose soil, exacerbated by constant fluctuations in reservoir elevation. Therefore, the occurrence of a large-scale landslide within the reservoir that could generate impulse waves and significantly affect the critical structures of the dam is not expected.

4. Dam Instrumentation Monitoring and Data banking

Dam instrumentations are essential in monitoring the structural integrity and safety of the dam. This includes seepage weirs, open standpipe piezometers, vibrating wire piezometers, flow pipes, and strong motion accelerometer/ accelerographs which are all monitored daily. For the Ambuklao, Binga, San Roque and Angat dams, the dam instruments are being measured by the plant operator. The data are submitted to NPC monthly for analysis and data banking. For the Caliraya dam, the dam instruments are being measured by NPC personnel including the instruments at Lumot dam. In case of unusual/emergency situations such as earthquakes, taking measurements are immediately conducted to determine if there are any effects on the dam structure.

The dam instrumentation historical data are collected and stored. These are analyzed to determine the behavior of the instruments. These data are also compared with the reservoir elevation and the basin rainfall to understand how these factors affect the dam structure.

II. FLOOD FORECASTING & WARNING SYSTEM DIVISION

1. Information and Education Campaign (IEC)

The Information and Education Campaign (IEC) is an annual activity of the Dams Management Department (DMD) that aims to impart important information and increase the level of awareness of the concerned Local Government Units (LGUs) and communities located downstream of DMD-managed dams in Luzon: Ambuklao, Binga, San Roque, Angat and Caliraya Dams. The IEC is conducted in collaboration with other agencies, stakeholders, and plant operators to discuss various topics concerning hydro-meteorological hazards, floods, dam discharge warning operations, water management, dam safety program, and emergency response. It also aims to prepare the Local Government Units and downstream communities to deal with flood-related hazards that may be caused by dam/ reservoir operations.

For CY 2023, a total of fifteen (15) IEC sessions were conducted and completed through face-to-face sessions on the following dates:

Location	No. of Sessions	Inclusive Dates
Caliraya Dam	3	March 21-23, 2023
Angat Dam	5	April 25-27 & May 3-4, 2023
San Roque Dam	4	May 9-11 & 23, 2023
Ambuklao-Binga Dams	3	June 20-22, 2023



Conduct of Information and Education Campaign on Caliraya Dam (March 21 – 23, 2023)

Three (3) IEC sessions were conducted at Lumban and Pagsanjan in the Province of Laguna. Representatives from various collaborating agencies: PAGASA, NPC, CBK-PCL, and the Provincial Government of Laguna served as resource speakers. The said event was attended by members of the United Boatmen Association of Pagsanjan (UBAP), residents, and DRRM officers at municipal and barangay levels in the Municipalities of Lumban, Cavinti, and Pagsanjan.



Conduct of Information and Education Campaign on Angat Dam (April 25 – 27 and May 3 – 4, 2023)

Five (5) IEC sessions were conducted at various municipalities: Angat, Bustos, San Rafael, Baliwag City and Malolos City. Representatives from various collaborating agencies: PAGASA, NPC, MWSS, NIA, and the Provincial Government of Bulacan served as resource speakers. The said event was attended by various DRRM officers in municipal and barangay levels in the Province of Bulacan.



INFORMATION AND EDUCATION CAMPAIGN

SAN ROQUE DAM

MAY 9-11, 2023
MAY 23, 2023
















“Pagtiyak na ang lahat ng mamamayan sa ibaba ng dam ay napapangalagaan sa banta ng kalamidad.”

Conduct of Information and Education Campaign on San Roque Dam (May 9 – 11 and 23, 2023)

Four (4) IEC sessions were conducted at various municipalities: San Nicolas, Bautista, Alcala, and Bayambang, Pangasinan. Representatives from various collaborating agencies: PAGASA, NPC, SRPC, and the Provincial Government of Pangasinan served as resource speakers. The said event was attended by various DRRM officers at municipal and barangay levels in the Province of Pangasinan.



Public Information Dissemination/ Information and Educational Campaign

Ambuklao & Binga Dams

June 20-22, 2023
Spillway Gate Reliability Testing
July 19-21, 2023

“Pagtiyak na ang lahat ng mga pamayanan sa ibaba ng dam na pinapatakbo at pinananatiling maayos ng NPC ay napapangalagaan sa banta na dulot ng bagyo, lindol at panganib na gawa ng tao”

Conduct of Information and Education Campaign on Ambuklao-Binga Dams (June 20 – 22, 2023)

Three (3) IEC sessions were conducted in the Municipalities of Bokod and Itogon, Benguet. Representatives from various collaborating agencies: PAGASA, NPC, SNAP-BI, and the Provincial Government of Benguet served as resource speakers. The said event was attended by residents, barangay officials, and DRRM officers in Brgy. Ambuklao, Bokod, Brgys. Tinongdan and Dalupirip Itogon, in the Province of Benguet.

2. Flood Drill/ Table Top Communication Drill at Caliraya Dam

The Flood Drill/Table–Top Communication Drill is an activity related to the conduct of the Information and Education Campaign (IEC) on Caliraya Dam which aims to gauge/measure the efficiency of disseminating dam discharge warning messages towards the downstream communities as well as the exchange of information among the concerned agencies involved should there be a need for Caliraya Dam to conduct spilling operations. This also aims to identify communication gaps, if there are any, and to strengthen further the links within the information network. Note that Caliraya Dam has no record of spilling operations through the spillway gates due to extreme weather disturbances in its entire history. In addition, the flood propagation of water releases from the spillway gates to the downstream communities only takes about twenty to forty minutes which is a very limited time to take precautionary measures. Furthermore, Caliraya Dam is also a tourist spot thus, there is a greater risk of conducting actual dam discharge warning operations as compared with other dams. Therefore, this activity will prepare the concerned agencies particularly the Disaster Risk Reduction and Management Offices (DRRMOs) should the need to conduct spilling operations at Caliraya Dam arise.

The said activity was conducted on March 28, 2023, in cooperation with different coordinating agencies: Provincial Disaster Risk Reduction and Management Office (DRRMO) – Laguna, Municipal DRRMOs of Pagsanjan, Lumban, and Cavinti, Laguna, PAGASA, and CBK-PCL.



3. River Profiling and Cross-Sectional Survey

The National Power Corporation (NPC) in collaboration with the Pampanga River Basin Flood Forecasting & Warning Center (PRBFFWC) conducted a joint river cross-sectioning at some specific points along the Pagsanjan River (Laguna) from November 20 to 24, 2023. There were 3 river cross-sections surveyed along the said river channel.

The main purpose of the undertaking was to come up with a river flood assessment levels for the Pagsanjan River based on the river cross-sections and possibly to determine the likely maximum water level and/or flow capacity that the Pagsanjan River channel can hold along its channel based on the measurement undertaking.



4. Reliability Testing of Spillway Gates

The annual spillway gates testing is being carried out with the Dam Operators to ensure reliability of the spillway gates during spilling operation. The tests were successfully completed and conducted for the following dams:

Stations	Date
San Roque Dam	April 12-14
Caliraya Dam	May 18
Angat Dam	June 9
Ambuklao and Binga Dams	July 19-21

5. Preventive Maintenance of FFWS Equipment

The periodic preventive maintenance activities are being conducted to avoid or mitigate the consequences of equipment malfunction especially during spilling operations. The quarterly preventive maintenance activities were conducted on the following schedules, as shown in the table below:

Stations	1Q	2Q	3Q	4Q	Remarks
Ambuklao - Binga	Mar. 15-19	June 7-10	Sept.18-22	Nov. 13-17	Witnessed as per OMA Agreement
San Roque	Feb.6-17	May 15-25	Aug.14-25	Nov.15-29	Completed On-time
Angat	Feb. 2-24	May 10 - June 16	Aug 2 - Sept. 15	Nov 14- Dec. 15	Witnessed as per OMA Agreement
Caliraya	Mar. 13-17	May 18, Jun 19-23	Sept 25-29	Nov. 20-24	Completed On-time/

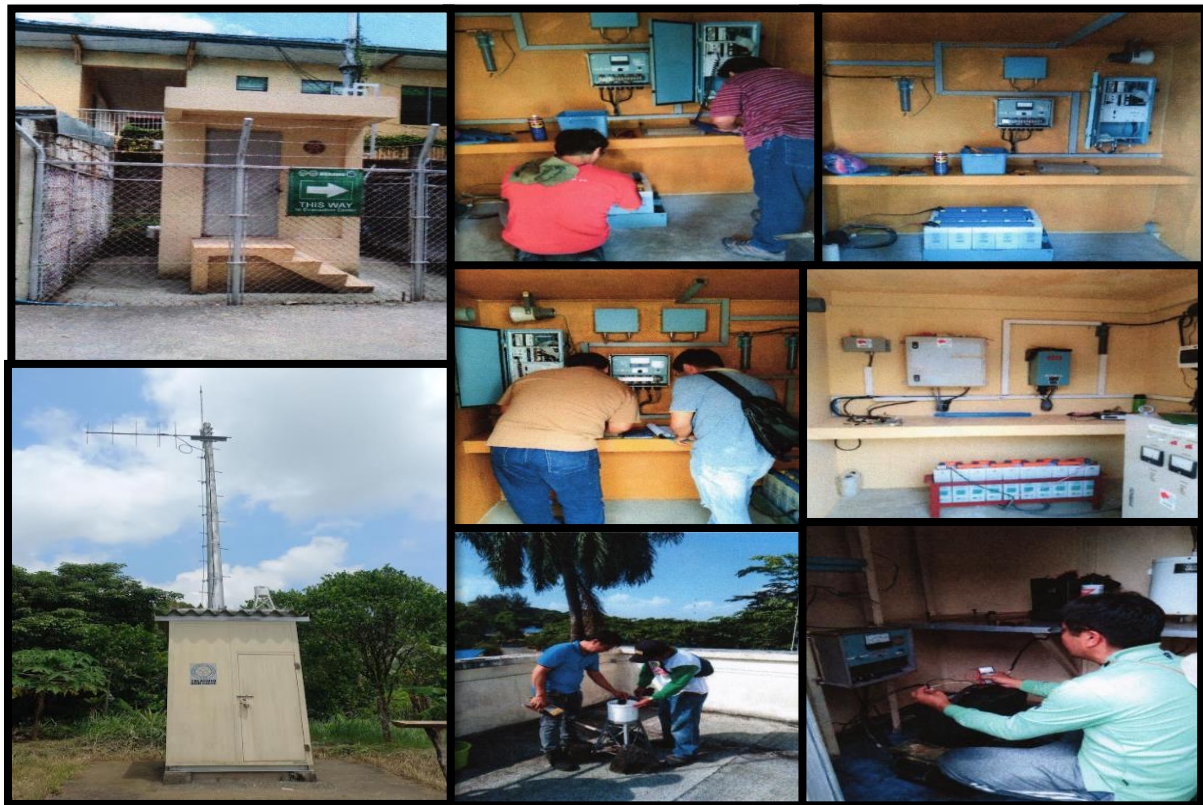
Ambuklao – Binga Dams



San Roque Dam



Angat Dam



Caliraya Dam



6. Dam Discharge Warning Operation

The dam discharge warning operation refers to a series of coordinated activities and procedures carried out by NPC in coordination with other dam stakeholders to manage the release of water from the dam including the proper broadcast and dissemination of dam discharge warnings to the general public to ensure dam and public safety and mitigate potential flooding risks. For CY 2023, the Dams Management Department conducted a total of five (5) dam discharge warning operations as enumerated as follows:

Location	No. of NPC-Initiated Spilling Operation	Inclusive Dates
Angat Dam	3	January 5-8, 2023 (due to Northeast Monsoon)
		November 29 - December 6, 2023 (due to Northeast Monsoon)
		December 14, 2023 - January 4, 2024 (due to Northeast Monsoon)
Ambuklao Dam	1	July 24-28, 2023 (due to TC Egay)
Binga Dam	1	July 24-28, 2023 (due to TC Egay)

Note that for this year, no dam discharge warning operations were conducted at San Roque Dam and Caliraya Dam.