

Proposals for the Completion of the Regulation on the Exploitation of Reservoirs within the Dniester Hydropower Complex

1. The Regulation on the exploitation of reservoirs within the Dniester Hydropower Complex (hereinafter referred to as the Regulation) must contain a reference to *Treaty between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on Cooperation in the Field of Protection and Sustainable Development of the Dniester River Basin from 2012* (hereinafter referred to as the Dniester Treaty), which is the legislative basis concerning the rational and environmentally sound use and protection of water resources, other related natural resources, and the ecosystems of the Dniester River basin in the interests of the population and sustainable development of the states of the Contracting Parties. In this regard, the operation of the Dniester Hydropower Complex (hereinafter referred to as DHC) and its impact on the ecological status of the river is reflected in the mentioned Dniester Treaty.
2. In the General Provisions section, it is necessary to indicate the transboundary nature of the river and the need to consider the interests of water users and the river ecosystem, including on the territory of Moldova.
3. It is considered important to develop and include in the Regulation and application of a ***methodology for the operational coordination of emergency situations*** or hydrological risks, such as floods, hydrological drought, emergency situations of any nature, which would clearly justify the reasons requiring a change in the operating mode of the DHC. Operational coordination will be carried out by the competent institutions from the Republic of Moldova and Ukraine.
4. Since the operation of the DHC directly affects the interests of the Republic of Moldova, it is considered appropriate that the operation mode of the DHC be coordinated with the competent agency of the Republic of Moldova. In this context, it is proposed to include in the General Provisions a point: *The operation regime of the reservoirs of the HPP and PSHP cascade on the Dniester is coordinated (monthly, during the spring floods, pluvial floods, low water) by the Interdepartmental Commission (within the Water Resources Agency) for coordinating the operating regimes of the reservoirs on the Dniester and Dnieper (hereinafter referred to as the Interdepartmental Commission) with the mandatory participation of representatives appointed by the Republic of Moldova.*
5. Considering that HPP-1, HPP-2, and PSHP are managed by different entities, such as state and private, it is necessary to organize the joint management of

these facilities and to include in the Regulation ***a methodology for the joint coordination of the three hydrotechnical structures.***

6. It is proposed that the following to be included in the General Provisions section:

4. The Regulation was developed in collaboration with the competent authorities of the Republic of Moldova, and its general/framework regimes are implemented through an ***operational methodology for the exploitation of the DHC reservoirs***, for the application of which the competent authorities of the Republic of Moldova are consulted.
5. The Regulation and the methodology for the exploitation of the DHC reservoirs contain evolutionary rules and prescriptions based on the experience accumulated in their practical application. This experience will be duly recorded and used when updating the Regulation and the methodology.
6. The Regulation, including the operational exploitation methodology, is ***periodically*** updated as necessary, based on the accumulated experience in the exploitation of the DHC reservoirs and the management of the impact of reservoir exploitation on the environment and water users upstream and downstream of the reservoirs, in collaboration with the competent authorities of the Republic of Moldova. In this regard, the competent authorities of Ukraine and the Republic of Moldova will regularly consult, preferably during the meetings of the Dniester Commission, to determine the need for updates.
7. Control over compliance with the DHC Regulation must be carried out jointly by the competent authorities of Ukraine and the Republic of Moldova.

7. Completion of point 2, Chapter II of the Regulation as follows:

The exploitation (operational) levels, volumes, and areas of the DHC reservoirs (in accordance with the data from the construction projects of the reservoirs and the rating curves of volumes and water surface areas) specified in annex 1 to these rules are used as initial data for the development and establishment of the operating regime of the reservoirs *in the absence of other updated data resulting from the experience accumulated in the monitoring and exploitation of the DHC reservoirs and of the measures to reduce the impact of reservoir exploitation on the environment and water users upstream and downstream of the reservoirs.*

8. Revision and completion of point 4, Chapter II of the Regulation as follows:

4. Priorities in regulating the Dniester Hydropower Complex reservoirs:

- Reducing the negative impact of floods *with possible catastrophic effects (through efficient operational drawdown)*;
- Supplying water to downstream localities and enterprises *(at least 100 m³/s/day)*;
- ensuring the environmental protection function through: increasing water discharges of the Dniester River downstream of the DHC during low water periods, eliminating or significantly reducing discharge fluctuations (hydropeaking) caused by the operating mode of HPP-1 and HPP-2
- Ensuring water supply for irrigation;
- Navigation from the HPP of the buffer reservoir to the Dniester river mouth;
- Generating electricity at the HPP

9. Completion of point 2.2 "Buffer reservoir and PSHP reservoir" Chapter III of the Regulation as follows:

To prevent significant intraday discharge variations at the outlet of the buffer reservoir, HPP -1 and PSHP will be operated alternately (morning/evening), paying special attention to the operating mode of HPP-2.

10. Completion of point 3.2 "Buffer reservoir and PSHP reservoir" Chapter III of the Regulation as follows:

To prevent significant intraday discharge variations at the outlet of the buffer reservoir, HPP -1 and PSHP will be operated alternately (morning/evening).

11. Article 9(2) of the Dniester Treaty (2012) states: *ensuring compliance with the regime and conditions for water distribution, with priority attention to regulating ecological flows to meet the needs of ecosystems. The volume and timing of water releases are coordinated by the Contracting Parties within the Commission.* Since international treaties take precedence over national legislation, the function of establishing the spring ecological flood regime should be transferred/ coordinated with the members of the Dniester Commission, both on the Ukrainian and Moldovan sides.

12. Considering the experience of water releases from the DHC in the spring of the current year, when, within a short period, the HPP-1 reservoir was emptied from approximately 120,8 m abs. to approximately 114,5 m abs., it is proposed to include a provision according to which measures will be taken to accumulate water in the HPP-1 reservoir to a level of 120,5 - 121 m abs. by the beginning of

April to organize spring ecological floods, with the maximum water release being up to 116,5 - 117 m abs. In the same context, the maximum flood discharge should be increased to at least to 800-1000 m³/s for a period of at least 5-7 days. During the spring ecological flood period, the interstate coordination of the flood regime is carried out no less than once a week through joint meetings, taking into account hydrometeorological data and forecasts and the situation in the basin, including air and water temperatures.

13. In comparison with the 1987 edition of the Regulation, the function of ensuring uniform water discharge from the buffer reservoir downstream throughout the day was excluded from the current Regulation. Given the ecological importance of this function for the Moldovan section of the river, it is proposed to add it, establishing maximum permissible parameters for intraday fluctuations in water level due to the pulsator effect of the waves downstream of HPP-2 (hydropeaking effect) of no more than 35 cm. In the same context, the threshold value for the rate of water level increase/decrease is considered to be 5 cm/hour, regulated by the *European Normative Document SR EN 15843:2010 "Water quality. Guidance standard on determining the degree of modification of river hydromorphology"*.
14. To reduce the hydromorphological alteration of the downstream sector of HPP-2, it is considered appropriate to reference in the Regulation and comply with the *European Normative Document SR EN 15843:2010 "Water quality. Guidance standard on determining the degree of modification of river hydromorphology"*. In particular, table A1 must be taken into account, the characteristics evaluated for flow and longitudinal connectivity damage, and table A2, which regulates the change in water flow.
15. In the context of ensuring meteorological and hydrological data, as well as the vast experience in forecasting hazardous hydrometeorological phenomena, as well as the equipment of the State Hydrometeorological Service of Ukraine with computational technology, we believe that point 5.1 *regarding the operation of the Dnestrovsk reservoir without considering the hydrological forecast, and annex 7 concerning the Indicators for passing floods of different exceedance probabilities through the Dniester HPP (without using forecasts)*, should be excluded from the current Regulation, and the table in annex 10 must be corrected according to the flood passage scenario using forecasts. The presence of flood passage indicators without using forecasts significantly increases the risk of flooding the territory of the Republic of Moldova, especially in the case of floods with less than 0,5% exceedance probability. We emphasize that the flood protection dikes on the territory of the Republic of Moldova are designed to protect against floods with a discharge of 2600 m³/s.

16. It is propose to correct the tables in annex 2 so that they start from the initial volume, not from 1331 million m³, as well as from the water surface area from 0, not from 892 km², to make the information about the volume and surface rating curves complete.
17. We propose to include in the annexes: the scheme of the DHC reservoirs, a table with the volume and surface rating curves of the PSHP reservoir, annexes 6-18 from the draft Regulation presented for analysis to the Moldovan side in 2021 (at the 3rd meeting of the Dniester Commission). These annexes provide clarity regarding the operation of the DHC reservoirs and the passage of floods of various exceedance probabilities through the DHC.

Additional requests

- At point 2, Chapter III, namely: *the discharge of excess water above the upper limit of zone III as it accumulates* - The competent authorities of the Republic of Moldova would like to ask for concrete examples of this operation.
- At point 3.2, Chapter III, namely: *Daily operation of the buffer reservoir and the PSHP reservoir*: The authorities of the Republic of Moldova would like to know several exemplary scenarios regarding the operation of HPP-2 during the pumping and turbine mode of the PSHP compared to the turbine discharges of HPP-1 and what adverse effects and associated risks may occur downstream of HPP-2.
- At point 4.1, Chapter III, namely: *To meet the environmental requirements of the lower course of the Dniester, including to flood the floodplains of the Dniester and spawning grounds, the operation regime of the reservoir is established based on the hydrological forecast and the need to comply with ecological releases for a certain period (hereinafter referred to as the ecological flood)*: Given that the spring months have been designated as the main period for accumulating water in the Dniester reservoir to restore water reserves as close to the NNR as possible, the competent authorities of the Republic of Moldova consider it necessary to have scenarios that should be considered in the practical operation mode. For example, is intervention needed during one or more spring floods (sometimes for only a few days)? What is the optimal ecological period during which accumulation-emptying maneuvers can be adapted, and what is the maximum acceptable emptying volume to supplement downstream discharges that would meet ecological requirements in the current year? These scenarios could be included as an

annex to the regulation or as part of the proposed operational exploitation methodology of the reservoirs.

- At point 5, Chapter III, the competent authorities of the Republic of Moldova noted that in none of the flood management options is there a mention of the function of pre-empting of the HPP-1 reservoir in the period preceding the flood in the Dniester reservoir area. Considering that the efficiency of the flood management scheme decreases when it comes to large floods, pre-empting of the HPP-1 reservoir should be considered. It is possible that without pre-empting during the forecasted flood anticipation time at the Galich and Zalischiky posts, the simple propagation of large floods to the HPP-1 section may not have a significant effect on reducing the flood risk for the downstream sector.
- At point 4.1, Chapter III, namely: *During the ecological flood in the fish spawning season, the daily decrease in the reservoir level at the Dniester HPP dam is allowed up to 10 cm (at a water level of 119,0 m abs and below) and up to 20-25 cm (at a water level above 119,0 m abs).* The competent authorities of the Republic of Moldova noted the importance of understanding these limits as they directly reflect water discharge rates and limit their increase to ensure sufficient water volumes in the lower course of the Dniester River.