Thank you very much for referee's valuable comments and suggestions. In the following is our reply:

Reviewer comments:

The problem is very interesting, but its discussion is sadly incomplete. Analyzing the current version of the article, clear conclusions for the ICOLD cannot be drawn, and thus the acceptance of the submitted description for publication in an international journal is problematic.

I wish to analyze a diagram that is crucial for a discussion of disasters affecting hydraulic structures, such as dams. Key details for an analysis include:

Functions to be performed by the structure – a description Geomorphological and hydrological conditions Design guidelines (applicable during design work), data adopted for designing purposes, obtained final flow capacity parameters of the structure, geotechnical parameters of the structure, device output curves

A short operational description of the structure, technical assessments made, hydrological events, structure condition (maintenance status), changes in geotechnical parameters, dislocation of land-surveying points, filtration through the structure and results of control operations complete probabilistic and physical characteristics of the input function that directly caused the disaster indirect conditions, here e.g. instructions for water management in the reservoir as a principal document binding upon the operator and deviations in control processes with their reasons An analysis of simulation results and an assessment of potential differences compared to ICOLD data, applicable assessment methods that were used (e.g. empirical formulae) If a structure with the same cross-section is to be reconstructed, a rationale must be given with applicable regulations and new characteristics of devices

Authors answer:

The authors thank the Reviewer for his comments. First of all we want to answer that the purpose of our paper was not preparing the data for an ICOLD data base. Satisfying this expectation the paper would have a substantially larger number of pages, probably beyond the editorial acceptance. We tried to distill the most relevant data and information, even though the paper became already sizeable, going to increase after reviewer comments.

The items indicated above are not explained in the article (items 3, 5, 7, 8) or are incompletely explained (all remaining items). The title indicates that the article was aimed to describe the causes of disaster, its development and consequences. All those elements can be identified but cannot be characterized as scientific. The article is structured as a superficial report on a failure, without any scientific commentary and references to formulas that are currently used to assess and analyse disasters (an attempt to analyse the problem scientifically was made in the previous version). The manuscript lacks a scientific commentary substantiated by calculations.

The in previous paper version presented calculations of the dam breach characteristics (breach dimensions, time, outflow) using empirical formulas gave significantly different results. Reviewer # 1 in his first evaluation stipulated that using empirical formulas for such a complex case is doubtful and prone

to discussion. The authors after making this difficult exercise agreed to this comment and removed this part from the paper. Further, we would like to emphasize that the major goal of the paper is to present the numerical modelling approach to determine the flood hydrographs on the Witka river and the Lusatian Neisse river leading to the catastrophe of the Niedów dam and material losses downstream. The complexity of this analysis is linked to the data limited situation, including the damage of the gauge stations both in the Czech Republic, Poland and Germany. Therefore the authors applied a numerical hydrodynamic model and a trial and error approach to find the unknown hydrographs. This approach in this complex situation of two superimposed floods, is the major achievement of the research, relying also on a vast number of data collected from different sources. No other choice is possible to attempt the evaluation of the outflow hydrogram. The documentation value of this work should not also be disregarded.

The proposed formula (1) ignores the physics of the phenomenon and is erroneous.

Thank you for this remark. The formal error made in the equation (already corrected) has no influence on the modelling results as the retention dynamics is included in the applied 2D model solution.

Additionally, the concept of iteration is introduced without a precise equation / system of equations explaining that concept.

As above, this procedure will also receive additional comments.

One of the most important tasks in analysing this type of disasters is to compare inflows with throughput capabilities of the structure (a capacity curve of discharge and spill devices - here omitted).

The capacity curve for this type of structure is relatively well known. Therefore, we provided only the maximum capacity at a given water level in the reservoir. We reconsider adding this item.

In the description of hydrological background (precipitation and flow rates), hyetograph information is omitted, and there is no reference to the probability of maximum annual flow rates being exceeded.

There is a number of meteorological station in the catchments of the Lusatian Neisse and the Witka river. The authors will reconsider including this piece of information as representative for the event under discussion. On the other hand, the purpose of the paper was not to analyse the run-off from the catchment and the exact meteorological conditioning.

Indeed, there is only a short information regarding the flood exceedance probability, i.e. the return period ranging from 100 to 200 year. A reference to this statistical evaluation can be corrected (actually it is already present as IMGW et al., 2010 – a trilateral report).

The discharge and spill devices in the structure were designed for a 1,000-year flood (estimated in the 1960s at about 650 m3 /s). There was no applicable regulation then in force, other guidelines were followed, namely Soviet standards). The guidelines in force at present (Journal of Laws Dz.U. 2007 no. 86 item 579) require that the structure be designed with parameters meeting the requirements for Class 1: a 5,000-year flood (Wpływ stanu technicznego na katastrofę zapory Niedów, Kostecki S., Rędowicz W., Machajski J., Politechnika Wrocławska, Przegląd Budowlany – 2012) – but is designed for a 1,000-year flood. There is no information about this aspect, and no comment explaining the reason for a reduced class of that hydraulic structure.

The paper may be called not to tackle a number of aspects regarding the Niedów dam in terms of construction and exploitation. Again, the paper would become sizable doing so. These issues were intentionally shortened or omitted under our statement of the scientific goal.

The key cross-sections, referring to Figure 10, do not contain flow hydrographs.

The flow hydrographs are presented in fig 13.

Table 2 contains a surprising example of consistency between calculation results and measurements, unattainable in bivariate modelling. This requires comments, especially considering that the measurements were not taken during the process but after some time.

As above stated additional comment will be included. But please note that the peak discharge in Table 2 results from the hydrodynamic modelling (will be clarified in the text).

The article is unsuitable for publication in its current version, it has to be supplemented and thoroughly restructured. Its technical language must be corrected.

A general statement. Please be more specific or provide examples. Any exact improvement suggestions will be highly appreciated.