

Comments on the EurEau Proposal for a Harmonised Leakage Reporting Index

Introduction

This paper sets out a preliminary response of the IWA Water Loss Specialist Group (WLSG) to the Proposal from EurEau dated November 2023 for a Harmonised Leakage Reporting Index in EU Member States.

IWA WLSG response to the Directive

In 2022, the IWA WLSG issued a Position Paper on the use the ILI (Infrastructure Leakage Index) performance indicator within the EU Drinking Water Directive and associated Taxonomy Regulations (accessible from the link below) which commented on the requirements of the Directive and explained the context in which ILI should be used.

<https://iwa-network.org/news/iwa-water-loss-specialist-group-position-statement-use-of-the-infrastructure-leakage-index-in-eu-directives-and-regulations>

Response to the Eureau Proposal, November 2023.

The same order as the sections in the EurEau Proposal is used:

Summary

The objective of requiring all EU member states to report using the same leakage index in order to facilitate comparisons between countries and performance against central targets is supported. However, there are concerns over the index proposed by EurEau for that purpose and believe that further work is required to establish a reporting system that is meaningful and practicable within the timescales required by the Directive.

Also, it is not clear what EurEau mean by the statement that the index “should be based on volumetric units”. Further details on this would be useful.

Introduction

The IWA WLSG agree that there should be a standardised method of calculating leakage rates across the EU rather than each member state reporting using its own methodology and it is recommended using the IWA standard water balance as set out in the Context Annex of the EurEau proposal. Member states should be given guidance on the application of the IWA standard water balance including ranges of values to be applied to confidence grades for each component.

Further, principles of the IWA PI Manual (Performance Indicators for Water Supply Services, Alegre et al., IWA Publishing 2017) should be followed for the calculation of the water balance and PIs and relevant context information.

The IWA WLSG agree that any harmonised leakage index should be complemented by additional information including additional indices at the discretion of member states. It is unlikely that all water operators will be able to report with the same level of confidence and so each reported index should be given an appropriate confidence grade.

Background

The Directive appears not to make clear whether data has to be provided for the whole of the member state or only for certain supply systems. It is important that the harmonised index be used for the purposes intended by the Directive and this needs to be defined in a careful and unambiguous manner.

The target of calculating an “EU-wide average leakage rate” has to be questioned, as the “average leakage rate” may not represent a best practice value, which should be used as a long-term target for all EU member states without consideration of individual framework conditions of each country (including public health, environmental, technical and economic considerations), and for each water supply system within a member country.

It is also pointed out that averaging the individual utility or EU state leakage rates will not provide the EU-wide average leakage rate. At best the median leakage rate could be provided but this would require careful interpretation. It would be necessary for each utility to provide the prime data (e.g. volumetric leakage, number of connections, length of mains etc) in order to work out the EU-wide average leakage rate.

Why do we need harmonised leakage reporting?

Ideally there should be a harmonised leakage reporting index for the purpose of reporting under the Directive, but agreement on a single index acceptable to all will be difficult. The IWA WLSG would welcome the opportunity to work with EurEau to agree which index (or indices) is most suitable.

Which index (or indices) should be used?

Whilst ILI is a useful indicator for leakage management purposes, it is not considered appropriate for use as a harmonised index for reporting and target setting for the following key reasons:

1. ILI is estimated as:

CARL (current annual real loss) / UARL (unavoidable annual real losses). UARL requires an assessment of:

Lm = mains length (km).

Nc = number of service connections.

Lt = total length (km) of service connections (main to meter).

Pc = current average operating pressure (metres).

As EurEau point out, not all of this data is available at all water utilities. Whilst water suppliers should know the length of their network and the number of service connections, properties supplied, it is unlikely that all will know the length of service connections or the average operating pressure with a degree of certainty.

It is important that the KPIs used for regulation and comparison should be based on robust auditable data wherever possible rather than estimated values.

2. ILI takes account of system pressure. It indicates the magnitude of current leakage (CARL) compared to the unavoidable leakage (UARL), at the current average operating pressure. Therefore, it is effectively a measure of performance on active leakage control given the current state of the infrastructure and the current operating pressure.
3. ILI is recommended for use in systems with more than 5,000 service connections and system pressure between 45m and 60m head.

EurEau proposal for a harmonised index

The proposed EurEau harmonised leakage reporting index has the following limitations:

1. The EurEau proposal is for a harmonised leakage reporting index: Non-Revenue Water (NRW) is very different from leakage as it includes known consumption that is not charged for (Unbilled Authorised Consumption) as well as uncertainties included in what we know as Apparent Loss.

Whilst the reasons for EurEau proposing the use of NRW is understood, the numerator in the index should be the annual level of real loss as determined by applying the IWA standard water balance, set out in the Context Annex to the EurEau proposal. NRW is easier to estimate than Real Loss. However, the Directive states *“In accordance with Directive 2000/60/EC, Member States shall ensure that an assessment of **water leakage levels** within their territory and of the potential for improvements in **water leakage reduction** ---”*. So, the numerator of the index should be the leakage level i.e. the level of Real Loss and not the level of NRW.

2. The EurEau proposal is to divide the NRW rate by the length of water mains in the network. Although that is one of the denominators in regular use, it does not take account of the urban or rural nature of the supply network. The other measure in regular use is to divide by the number of properties supplied, or by the number of service connections. This is important because it is recognised that a significant proportion of leakage occurs on the branches off the water mains network.

The problem of providing fair comparisons between urban and rural networks with differing mains lengths per property-building (respectively service connection density) has been known for many years and is one of the prime reasons for the development of the ILI index. Dividing by the length of mains network (m³/km/day) tends to produce lower values for rural systems. In general, the real loss (and water loss) per km of mains length will increase at higher service connection densities i.e. more urban areas. Therefore, the alternative is to divide by the number of service connections or properties-buildings supplied (litres/connection/day) but that favours urban areas over rural ones. Ideally, the denominator in the KPI should reflect the size of the network for any service connection density, and recently proposals have been made for such an indicator which are under review by the IWA WLSG.

In the early stage of an EU wide collection of water loss performance indicators it might be recommended to collect several meaningful PIs, which are used as a basis for later target setting activities. Beside the indicators themselves, best practice in benchmarking has shown that context information on certain framework conditions (including public health, environmental, technical and economic considerations) is necessary to achieve comparability between water supply systems on a national and international level.

Context Annex

The IWA WLSG agrees with EurEau that providing information about the data reported for the Directive is essential. A set of guidance notes should be prepared setting out the acceptable methods of estimating the components of the water balance and their confidence grades, and the method of calculating the harmonised index.

The IWA WLSG is currently working on a KPI Initiative with the objective to prepare such guidance notes following IWA standards, which are seen as a state of the art in water balance and performance indicator calculations. A workshop, entitled COMPARING LEVELS OF WATER LOSS INTERNATIONALLY will be held on Sunday 14th April at the IWA Water Loss 2024 conference in San Sebastian, Spain. Any conclusions and recommendations arising from the workshop may be used in an updated response to EurEau.

Stuart Hamilton
Chair
IWA Water Loss Specialist Group