



STRATEGIES TO PREVENT NEGATIVE EFFECTS OF EXTERNAL THREATS IN IW INFRASTRUCTURE AND FACILITIES

PROPOSED TECHNICAL WORKING GROUP

TERMS OF REFERENCE

1. Background

Inland waterways (IW) require appropriate infrastructure to ensure permanent safe navigation conditions. Waterway administrators and authorities must work for the adequate maintenance of this infrastructure, elements, and systems.

These elements and systems are subject to deterioration and wear and tear due to use and the passage of time. Maintenance programmes should be focused on corrective and preventive tasks oriented to achieve the highest level of service.

However, it has been seen that damage to the waterway infrastructure can be caused not only by the regular navigation activities themselves or natural degradation (as corrosion). The intervention of third parties, unrelated to the IW activities, can be detrimental to some component elements of the waterway infrastructure and to the normal functioning of the processes necessary to ensure navigation.

These types of interventions, hereinafter referred to as '**External Threats**' (ET), are defined as harmful actions non-specific to planned navigation activities on navigable waterways delivered by third parties, whether intentional or not.

In the development of the study, 'External Threats' caused by other living beings (animals, plants, etc.) may also be considered. In the development of the work, the convenience or not of including such cases of study will be defined.

In response to External Threats, Waterway Administrators must react by repairing, modifying, or even redesigning waterway infrastructure, its environment, or some of its operational processes to reduce the negative effects of these threats. These unplanned reactions may lead to unwanted increases in maintenance costs and times, but may also affect the navigation itself.

External Threats (ExtTh) are defined as harmful actions that are not related to planned navigation activities, which impact negatively inland navigation. ExtTh may be caused directly or indirectly by third parties such as human beings, animals or plants, whether they act intentionally or not. ExtTh considered in this report relate only to the infrastructure and not to the management, cybersecurity, terrorism, shut down due to, for instance, COVID, climate change (flood, etc.), or natural deterioration (corrosion, aging, etc.). This definition may be discussed and eventually revised by the WG

Examples of what may be considered in this report as External Threat (these examples are not exclusive, others may arise) are:



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- Acts of Vandalism: Acts (intentional), which aim to cause damage by itself or, in other cases, theft of elements for subsequent reuse or sale.
- Interaction with other activities near the Waterway: External industrial, productive, or recreational (sports) activities that for some reason may cause damage to the infrastructure.
- Actions of occasional visitors: It has been seen in other PIANC reports that waterways fulfil important social functions (recreation, tourism, historical value) attracting occasional visitors or tourists that may cause damage intentionally or not. In such a case, actions or redesigns may need to be envisaged to avoid detrimental actions on the infrastructure generated in these situations.
- Misuse of infrastructure: activities associated with navigation, but for other purposes. This may be the example of houseboats in prohibited places, which generate interference in the operation or damage/modifications to the infrastructure.

2. Objectives

The objective of the working group will be to gather experiences from waterway management authorities that have suffered the action of External Threats in the infrastructure and operating systems of waterways.

The possible consequences of this type of intervention will be studied, and the mitigation measures which have been proposed (successfully or not) will be collected (case studies).

As a result of these case studies, strategies to mitigate or reduce the negative effects of the consequences of these threats will be discussed.

While vandalism will probably be the most frequent (and with the most negative consequences) case of External Threats, the report will exclude acts of terrorism or criminal actions with a high degree of organisation.

It will also exclude issues related to cybersecurity, a topic already addressed in TG 204.

3. Earlier Reports to be Reviewed

- PIANC WG 241: "Crisis Management of Accidents in Navigation Hydraulic Structures".
- PIANC WG 236: "Sustainable Management of the Navigability of Natural Rivers".
- PIANC TG 204: "Awareness Paper on Cybersecurity in Inland Navigation".
- PIANC WG 203: "Sustainable Inland Waterways – A Guide for Inland Waterway Managers on Social and Environmental Impacts".
- PIANC WG 139: "Values of Inland Waterways".
- PIANC WG 25: "Maintenance and Renovation of Navigation Infrastructure".

4. Intended Product

The intended product will be a paper containing relevant experiences in External Threats mitigation, examples of solved and unsolved critical External Threats situations and recommendations (conclusions) based on the discussions and examples studied.



Impacts of external threats and **how to react (mitigations)** at these threats will be extensively developed. Development of a '**Business Continuity Plan**' will be considered.

The report should address the need to shed light on an issue that is not usually taken into account in bidding processes, bid preparation, and the assessment of infrastructure maintenance budgets.

Readers should be able to reflect on the importance of the harmful effects of external threats based on examples and case studies and evaluate action plans and resources needed to mitigate the damage that they can cause.

5. Working Group Membership

The Task Group should include authorities, members and users representing:

- Technical staff and engineers, in charge of the waterways (design and operation),
- Port and harbour authorities,
- Inland Waterway managers and authorities;
- National Transportation authorities;
- Manufacturers of infrastructure elements and facilities;
- Security agencies or institutions.

6. Target Audience

External Threats are not usually considered in waterway preventive and corrective maintenance programmes. Many maintenance contracts do not take into account the possible negative effects that these actions will have on maintenance costs.

The report should be addressed to waterway administrators, maintenance contractors, and infrastructure concessionaires.

7. Relevance

The report of this Working Group will be useful to reduce the negative effects of these harmful interventions on waterway infrastructure and, ideally, to avoid them.

As mentioned, this is an aspect that is not usually addressed in maintenance programmes and can be a trigger for this aspect to be taken into account in maintenance schedules and budgets.

8. Relevance to Countries in Transition

For transition countries, the results of this report may be particularly interesting for two reasons.

First one: in these countries, unfortunately, it is more likely to encounter acts of vandalism, in particular, theft of items. These actions impoverish navigation (and navigational safety) conditions and require mitigation actions.



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Secondly, to alert authorities to the importance of considering these aspects in maintenance contracts. Normally, maintenance budgets in transition countries are limited, and it is important to know the possible consequences of External Threats and to collect, through experiences in other countries, strategies to solve them. Knowing these strategies will allow IW authorities to foresee specific maintenance plans and, in particular, to save money by not implementing solutions that may not be successful.

9. Relevance to Climate Change

Strategies to mitigate or resolve the negative effects of External Threats will be proposed within a framework of promoting care for the environment and the implementation of green technologies.

10. Working with Nature

Technologies and commendations which should remain compatible with the use and maintenance of IW infrastructure (avoiding they will also be considered as external threats by river managers). In this particular case, since issues associated with the waterway environment and its interaction with society are likely to be involved, the WG may propose friendly strategies to the social and recreational components.

11. UN Sustainable Development Goals

This WG is intended to support primarily the following "Sustainable Development Goal (UN's SDG)":

- Goal 9 "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation".