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| IALA Guideline |

G1124

Ports and Waterways Safety Assessment (PAWSA MKII) (*DRAFT REVISION)*

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# INTRODUCTION

The assessment and management of risk is fundamental to the provision of effective aids to navigation (AtoN). One method of risk management identified by IALA in Guideline G1018 Risk Management for use by National Members is the qualitative Ports and Waterways Safety Assessment MKII (PAWSA) tool.

# BACKGROUND

The United States Coast Guard (USCG) developed an initial version of PAWSA in the late 1990’s to assess the requirement for the use of Vessel Traffic Services and other AtoN. To assist the conduct of a PAWSA workshop, the USCG published the *Ports and Waterways Safety Assessment Workshop Guide* which provided guidance and procedures required for conducting a PAWSA. The Guide was organized into seven sequential chapters with supporting appendices that introduced the PAWSA process before describing the methodology; pre-workshop logistics requirements; participant selection; workshop preparation; session facilitation and post-workshop reporting. By 2010, over 40 ports and waterways had been assessed successfully using PAWSA. 4 tnational (PAWSA MKII).

# PURPOSE

The purpose of this document is to provide an overview of the PAWSA tool. In order to proceed with the PAWSA methodology and for more detailed information about how to use the tool please refer to the PAWSA Implementation Guide (ref).

# OVERVIEW OF PAWSA MK II

PAWSA PAWSA provides an assessment of risk in a defined waterway by means of a structured two-day workshop

The workshop process leads to numerical ratings, which provide a comprehensive but simple picture of the particpants’ expertise, the importance of different risk factors, the effectiveness of existing risk mitigation strategies and additional mitigation actions. These ratings are organised into five logical segments, the responses are recorded in aggregate form and the results are used in the appropriate subsequent phases of the PAWSA process as a basis for discussion among the participants.

*Waterway Risk Model*

Risk is defined as the product of the probability of a casualty and its consequences and the Waterway Risk Model includes variables dealing with both the causes of waterway casualties and their effects. The six risk categories used in the model are:

1. **Vessel Conditions** – the quality of vessels and their crews that operate on a waterway;
2. **Traffic Conditions** – the number of vessels that use a waterway and their interactions;
3. **Navigational Conditions** – the environmental conditions that vessels must deal with in a waterway relating to wind, water movement (i.e., currents), and weather;
4. **Waterway Conditions** – the physical properties of the waterway that affect how easy it is to manoeuvre a vessel;
5. **Immediate Consequences** – the immediate impacts of a waterway casualty: people can be injured or killed, petroleum and hazardous materials can be spilled and require response resources, and the marine transportation system can be disrupted;
6. **Subsequent Consequences** – the subsequent effects of waterway casualties that are felt hours, days, months, and even years afterwards, such as shore side facility shut-downs, loss of employment, destruction of fishing areas, decrease or extinction of species, degradation of subsistence living uses, and contamination of drinking or cooling water supplies.

The diagram below shows the form of the six risk categories and corresponding risk factors in the Waterway Risk Model.



## THE PAWSA PROCESS

The five main steps used in the PAWSA process are described in more detail in the Implementation Guide but the graphic below provides a simple overview of the process:

**Book 2:  
Risk Factor Rating Scales**

Provide input for aggregate risk measuring scales.

**Book 3: Baseline Risk Levels**

Establish risk levels and identify locations.

**Book 4: Mitigation Effectiveness**

Assess effectiveness   
of current mitigations.

**Book 5: Additional Mitigations**

Assess effectiveness   
of potential mitigations.

**Book 1: Team Expertise**

Establish weighting factors.

**PAWSA Day Two**

**PAWSA Day One**

## WORKSHOP ORGANISATION

PAWSA is an expert and stakeholder-centred process. An essential element of this process is a workshop where discussions are held and risk assessments are undertaken. Workshops are typically executed with a maximum number of 30 participants. Two major groups of participants are targeted; experts in navigation and traffic management in the waterway and significant stakeholder groups within the affected local community.[[1]](#footnote-4)

## INPUTS

The PAWSA process can use various information as inputs for the expert ratings for the risk factors. These include but is not limited to:

* Expert Knowledge;
* Detailed, quality assured records of maritime traffic, cargoes and maritime casualties;
* Official nautical charts and publications based, where possible, on modern surveys;
* Information regarding conservancy of goods in the waterway;
* Meteorological, hydrographic and oceanographic records;
* Details of proposed or planned maritime projects in or near the waterway being assessed;

## OUTPUTS

The PAWSA process converts qualitative discussion into quantitative ratings that

# USE

PAWSA is primarily useful in the risk analysis stage of the intermittent and strategic risk management processes

# STRENGTHS AND LIMITATIONS

Some strengths of PAWSA include:

* The waterway risk model and the process are based on extensive consultation within the maritime cluster, ~~with involvement from academia~~. The process has been refined over many years of use;
* The process is based on wide expertise from diverse waterway experts and stakeholder groups. This leads to a relevant knowledge base, while facilitating acceptance of the results;
* The process includes mechanisms to weight the teams’ expertise on specific issues, increasing the validity of the ratings;
* Focus is not only on the ratings per se, but also on the justification provided in support of these;
* PAWSA considers risk management measures for ~~factors concerned with~~ accident prevention, preparedness and response.
* Stakeholder buy in / commitment to results and control measures (from 1018)

Some limitations of PAWSA include:

* The process is resource-intensive, both in terms of ~~financial,~~ personnel and time commitments and possible financial implications. It is essential for there to be a competent facilitator to ensure the successful outcome of any PAWSA workshop;
* ~~The ratings are inherently qualitative and context-dependent. The ratings cannot be easily used along with cost-effectiveness criteria, and are more appropriately used as starting points for quantification of risk reduction and cost effectiveness using other (quantitative) methods.~~
* process is highly dependent on experts (take from 1018)
* Requirement for trained / expert facilitator

# ~~WHAT TO DO NEXT~~ IMplementation

In order to undertake a PAWSA workshop please refer to the IALA PAWSA MKII Implementation Guide (Ref.) which can be obtained from IALA (email: [contact@iala-aism.org](mailto:contact@iala-aism.org)) . The IALA academy can also provide training in the use of PAWSA.

Identify expert facilitator

# ACRONYMS

AIS Automatic Identification System

AtoN Aid(s) to Navigation

Bk Book

BRM Bridge Resource Management

DGCS Director General of Coastal Safety (Turkey)

DGPS Differential Global Positioning System

Disp Display

GRT Gross register tonnage

Hydro Hydrographic

IALA International Association of Marine Aids to Navigation and Lighthouse Authorities - AISM

IMO International Maritime Organization

LORAN Long Range Navigation System

Mgmt Management

MS MicroSoft

Nav Navigation

PAWSA Ports and Waterways Safety Assessment MkII

PAWSS Ports and Waterways Safety System

SN/Circ. Safety of Navigation Circular (IMO)

SOLAS International Convention for the Safety of Life at Sea (IMO 1974 as amended

USCG United States Coast Guard

VTS Vessel Traffic Services

# REFERENCES

TBC















































































































































































































1. The PAWSA Implementation Guide contains further advice related to selecting participants. It also contains guidance on practical issues such as inviting participants and read-ahead materials. [↑](#footnote-ref-4)