IALA TRAINING SEMINAR ON RISK MANAGEMENT:

PAWSA, IWRAP Mk2 & SIMULATION

27 November – 1 December 2011

Crowne Plaza Hotel, Muscat

Draft Report

Executive Summary

The seminar was held at the Crowne Plaza Hotel, Muscat and was attended by thirty-three delegates from eleven countries. Seventeen delegates were local to the region.

The seminar began with a series of presentations, including an introduction to the IALA Risk Management Toolbox, which includes Ports and Waterways Safety Assessment (PAWSA), IWRAP Mk2 and simulation. Two sessions were devoted to the PAWSA process, during which not only the method of conducting the workshops was explained but also the detailed planning required to prepare for and then support it. Following this, the delegates began to gain 'hands on experience' with the revised IWRAP Mk2 program. Presentations were made as the seminar developed, introducing additional topics and addressing aspects of the theory of IWRAP Mk2 in greater depth and there was an opportunity to compare the recently released commercial version of IWRAP Mk2 with the version generally available to IALA members. Subsequently, delegates developed their own models with a reasonable degree of correlation between their individual results.

Delegates were also given the opportunity to explore a more detailed and complete pre-processed model of Hatter Barn, using automatic input of AIS data via the commercial version of IWRAP Mk2. The use of the software by the delegates identified a number of potential improvements. The delegates then went on to develop their own models of the Strait of Hormuz.

Two sessions were devoted to simulation, which included case studies, current practice and the potential for future development.

In the final discussion, the complementarity of the three components in the toolbox (PAWSA, IWRAP Mk2 & simulation) was reviewed and a way in which each could play its part in a combined approach to risk management of a waterway was reviewed.

The seminar provided an excellent opportunity for delegates to get to know and discuss the theory and practice of the IALA Risk Management toolbox, drawing on the expertise of the instructors and the other delegates, whilst developing their own skills.

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1   INTRODUCTION

The IALA Training Seminar on Risk Management, featuring the Ports and Waterways Safety Assessment (PAWSA), IALA Waterways Risk Management Program (IWRAP) Mk2 and simulation, was held from 27 November to 1 December 2011 at the Crowne Plaza Hotel, Muscat, Oman. It was attended by thirty-three delegates from eleven countries. Seventeen delegates were local to the region.

The objective of the seminar was to introduce the delegates to the IALA Risk Management Toolbox and instruct them in its use, as well as to familiarise them with the strengths and weaknesses of the constituent parts. Considerable emphasis was placed on case studies.

The Secretary-General visited the seminar, during which time he called on the Minister for Transport and Communication (HE Ahmed Al Futaisi) and the Undersecretary for Transport and Communication for ports and maritime affairs (HE Said Al Harthi).

Day One – Opening of the Workshop and Introduction

2   SESSION 1   OPENING OF THE SEMINAR

The session was chaired by Jean-Charles Leclair, Dean of the IALA World-Wide Academy.

2.1   Welcome by AMNAS

Khalil Al Balushi welcomed the delegates to Oman and the seminar. He expressed the hope that all would benefit professionally and also enjoy the social programme. He said that AMNAS thought that IALA should be more involved in the region and wished AMNAS to be more involved in IALA's activities. Interaction is an important part of the seminar and he ended by saying that he hoped that everyone could benefit from the experience of the other delegates.

2.2   Welcome by IALA

Jean-Charles Leclair, IALA's IMO Representative and Dean of the IALA World-Wide Academy, thanked AMNAS for hosting the seminar welcomed everyone to the seminar, especially those visiting an IALA seminar for the first time. He apologised for the absence of the Secretary-General, who was absent on IALA business but who would be joining the seminar later in the week.

He mentioned the experience of the team that would be assisting the seminar and thanked them, in advance, for their participation.

2.3   Safety brief

A member of the hotel staff provided information about emergency procedures.

2.4   Introductions

The Chairman asked that delegates introduce themselves. This revealed a considerable breadth of experience amongst the delegates.

2.5   Introduction to IALA and the IALA World-Wide Academy

Jean-Charles Leclair introduced himself before using a presentation to cover Safety of Navigation responsibilities and the part now being played by AIS, IALA's role, IALA's organisation and the IALA World-Wide Academy (WWA). In speaking about the WWA, the increasing involvement with capacity building was mentioned before its structure was explained and the involvement in both VTS and AtoN training. It was mentioned that Oman is the first country to provide training in accordance with IALA Recommendation E-141.

It was explained that at earlier seminars, IALA had previously covered one or both of either PAWSA or IWRAP Mk2. At this seminar, the aim was to cover the three constituent parts of the Risk Management Toolbox, as described in IALA Recommendation O-134 on the IALA Risk Management Tool for Ports and Restricted Waterways.

With regard to PAWSA, it was made clear that the seminar was not aimed at producing a trained facilitator, the key person when organising a PAWSA workshop, but to learn how to organise one. For IWRAP Mk2 there would be a chance to see the benefits of the recently released commercial version of the program and be able to compare it with the publicly available version. Simulation would also be covered, to complete the coverage of the tools available to assess the risk of collision and groundings, as recognised by SOLAS Chapter V (Regulation 13 on Aids to Navigation).

It was stressed that, to be effective, IWRAP Mk2 requires statistical data and that AIS is essential to provide it, leading to a requirement for shore-based AIS networks. This led to a brief overview of IALA-Net.

He then wished everyone a successful seminar, under the guidance of Omar Frits Eriksson and with the assistance of a strong team of presenters.

2.6   Introductions

The Chairman asked that delegates introduce themselves.

3   SESSION 2 - PRESENTATIONS

This session was chaired by Jean-Charles Leclair, IALA.

3.1   Administration Brief

Mike Hadley, IALA Technical Co-ordination Manager, provided information on various administrative points. He advised that a USB memory stick, containing all the seminar material, including presentations, would be provided to delegates on Thursday 1 December. The information would also be posted on the IALA Workshop ftp server.

3.2   Introduction to the IALA Risk Management Toolbox

This session was introduced by Ómar Frits Eriksson, DMA.

Ómar Frits Eriksson began with a brief overview of IALA and its activities. He then provided a short introduction to the constituent parts of the IALA Risk Management Toolbox and the reasons why IALA is involved in risk management. He then briefly introduced IWRAP Mk2, which is a quantitative approach to risk management, the Ports and Waterways Safety Assessment (PAWSA), which is a qualitative approach, and then said that the two tools complement one another and can also benefit from the use of simulation. He then went on to speculate where simulation may develop and concluded with the current organisation of the Risk Management Steering Group.

4   SESSIONS 3 - 4 – PAWSA

These sessions were chaired and presented by Ómar Frits Eriksson, DMA.

4.1   General overview

Ómar Frits Eriksson spoke to a presentation that gave an introduction to the PAWSA process and the topics to be covered in the succeeding PAWSA sessions. The presentation and those that followed were prepared by Burt Lahn of the United States Coast Guard (USCG).

The presentation also covered the goals for conducting a PAWSA workshop.

It was noted that there is a shortage of experienced PAWSA facilitators, who are key to the successful running of a PAWSA seminar, and that this is something the IALA WWA would like to tackle. It was also observed that the existing facilitators are all English speakers and that the necessity to conduct a PAWSA seminar in English can be restrictive to full and spontaneous interaction from non-native English speakers. This led to the comment that there can also be cultural limitations in that what works for America does not necessarily work elsewhere and that the educational level of participants can also be an important factor.

4.2   Pre-workshop logistical planning

The importance of the preparations for the workshop and the time required for adequate preparation were presented.

4.3   Roles and responsibilities of the seminar sponsor, lead facilitator and support staff

The roles and interplay between those who organise a PAWSA workshop were covered. This included the role of the PAWSA program manager and the sponsor for the workshop, who is the local (USCG) Captain of the Port. Others involved and described in some depth were:

1   Lead facilitator;

2   Workshop / Venue Co-ordinator;

3   Port Data Display Specialist;

4   Workshop Note taker;

5   Workshop Data Co-ordinator / Venue Co-ordinator;

6   ECS Display Specialist / Note taker.

The presentation was based on the PAWSA workshop being a turnkey event but it was explained that the ability for locally organised workshops is provided for in the PAWSA Implementation Guide.

It was made clear that getting the right balance between the stakeholders is essential, to avoid bias, but with that caution in mind the useful input provided by pilots was noted.

4.4   Identifying data sources and compiling port statistical information for presentation during the facilitation process

The importance of the data gathering process was emphasised and the capability now being provided by the use of an electronic charting system was introduced. How the data is presented during a PAWSA workshop was then covered.

The ability to drill down into the data gathered for a PAWSA workshop and the educational role that this enables emerged, as did the potential for the inclusion of AIS data.

4.5   Data sources and methods, facilitation techniques & risk factors

An overview of the equipment capability required, the basic functions available from the use of an ECS in PAWSA, what data is needed and how it is then used to capture comments of workshop participants, was followed by a practical example.

As only a briefing about PAWSA was being given, it was possible to complete the topic during session 4.

4.6   Preparation and content of the assessment seminar report

The process of compiling and analysing the information required for a PAWSA report was covered, as was the preparation of the report. The establishment of baseline risk levels and the participant / team expertise cross-assessment were mentioned, as well as the effectiveness of existing risk mitigating factors. Additional interventions were identified, followed by a breakdown of finalised risk factors and the actions to mitigate them.

The composition of the various appendices to the report were covered, ending with the participant recommendations arising from the workshop. The topic ended with a review of the process for reviewing and then presenting the report, together with its dissemination.

There then followed an overall question and answer session, after which Omar Frits Eriksson provided a brief overview of space based AIS.

5   SESSION 5 – IWRAP MK2

This session was chaired by Ómar Frits Eriksson. Support was provided by Erik Sønne Ravn, (DMA), Professor Knud Benedict (Wismar University) and Per Christian Engberg (Gatehouse).

5.1   General overview and program installation

Following a general introduction to IWRAP, the installation software for the commercial version was distributed via a memory stick and the delegates were able to load the programme onto their laptops and then register for a temporary operating licence from Gatehouse.

END OF DAY

Day Two – IWRAP MK2

6   SESSIONS 6 - 9 – IWRAP MK2

These sessions were chaired by Ómar Frits Eriksson. Support was provided by Erik Sønne Ravn, (DMA), Professor Knud Benedict (Wismar University) and Per Christian Engberg (Gatehouse).

6.1   Introduction to IWRAP Mk2

The introduction began with the background to the development of the IALA Waterway Risk Assessment Program (IWRAP), which could be traced back to at least 1974, with significant steps forward being made in the mid to late 1990s, leading to the introduction of IWRAP Mk1 in 2006. The design rules and probabilistic approach taken were described. Brief mention was made of the selection of AtoN, the derivation of the effects of wind and current, the basis for the assessment of minimum safe channel width and the desirability of the channel width ratio being greater than 1.0. The development of probabilistic models was then described. It was explained that at a verification workshop in Copenhagen the Steering Group realized that the results obtained with IWRAP Mk1 were too pessimistic. The Steering Group then decided to start from scratch with the probabilistic modelling part. This had resulted in IWRAP Mk2 which has now been evaluated by the Steering Group, and found to be working well. Ómar Frits Eriksson stressed that IWRAP Mk2 only addresses the probabilistic part of the "Risk = Probability x Consequences" equation, and that proper training of analysts is essential for the successful application of IWRAP Mk2.

6.2   Programme Installation & Licensing scheme

Ómar Frits Eriksson ran through the installation process, the creation of a new project and then the definition of the model to be used. This included the creation of legs, the input of the traffic distribution, the entry of ship data and causation factors. Delegates were able to undertake these tasks, simultaneously, on their own laptops, using programs provided on USB memory sticks.

With regard to licensing, Ómar Frits Eriksson said that the basic version is freely available to IALA members on a one-year license, renewable with continuing membership of IALA.

END OF DAY

Day Three – Theory, Test cases and Case Studies

7 SESSIONS 10 – 13 IWRAP MK2 (CONTINUED)

These sessions were chaired by Ómar Frits Eriksson and moderated jointly with Knud Benedict and Erik Sonne Ravn.

7.1 Demonstrate the IWRAP Mk2 Software (basic)

The basic version of IWRAP Mk2 was demonstrated.

7.2 Running your first IWRAP Test Case

All delegates were then guided through an initial, low complexity test case.

7.3 The theoretical foundation behind IWRAP Mk2 (Part 1)

The session was run as a joint theory explanation and practical exercise by Knud Benedict and Erik Sonne Ravn. It began with an introduction to the background to the current development, the test cases to be used and the IWRAP Wiki site (http://www.iala-aism.org/wiki/iwrap/index.php). The site was further explained by Ómar Frits Eriksson, who asked the delegates to feel free with suggestions to contribute, saying that this would require them to be registered as contributors. However, anyone can open a discussion page. Erik Sonne Ravn then continued to describe the theoretical background to IWRAP Mk2 and the process to be followed for the current session, beginning with test case A.

7.4 IWRAP Test Cases A, B & C (Collisions)

Erik Sonne Ravn ran through test case A, the simplest case.

The seminar then moved on to test case B, which was introduced jointly with Ómar Frits Eriksson. This brought out the need for proper analysis of what the traffic is actually doing and the need for appropriate choices of nodes between legs in the model.

Erik Sonne Ravn then ran through a practical example of test case B, including the use of the share and copy function. The point was made that where default values are changed this should be recorded to avoid inadvertent use in the future and misinterpretation by other users.

The theory flowed naturally into a practical demonstration of test case C, following which it was said that application of the theory, so far, should enable the modelling of any scenario for collision risk assessment.

7.5 The theoretical foundation behind IWRAP Mk2 (Part 2)

This session also comprised joint theory explanation and practical exercise. It began with an introduction to the theory of the powered and drifting grounding components of IWRAP Mk2 and outlined the associated test cases.

7.6 IWRAP Test Cases D & E (Groundings)

Erik Sonne Ravn then ran through test case D. This led to discussion of Causation Factors and the values assigned to them and the need to keep track of changes made to default values. Just how drifting grounding is modelled provoked considerable discussion and Ómar Frits Eriksson drew attention to the chapter on this topic on the IWRAP Wiki site. He also admitted that the model does not yet handle drifting in confined waters and strong currents sufficiently well and that this is an area identified for further development. There was also a reminder that the model is not a ship simulator.

Erik Sonne Ravn then ran through test case E.

7.7 Introduction of the differences between the free and commercial versions of IWRAP Mk2

The differences between the free and commercial versions, the main one of which is the automated importation of AIS data, were explained and temporary commercial licenses

provided to the delegates. The full details are contained in the IWRAP Mk2 help file, under 'extended version'.

7.8   Overview of an IWRAP Analysis (using the Commercial version)

The session was chaired by Ómar Frits Eriksson and moderated jointly with Knud Benedict and Erik Sonne Ravn).

Using a case study, the session covered the following topics:

- Defining area to be analysed

- Gather information (charts, traffic volume, casualty data)

- Using Sea Chart Overlays

- Polygon Generation

- Defining route legs

- Allocating traffic to route legs

- Performing baseline analysis

- Performing What-If analysis

Erik Sonne Ravn illustrated the process for introducing and overlaying charts into the IWRAP Mk2 model. It was explained that the basic model does not cater for electronic charts as there are licence issues involved. However, it is expected that electronic charts will be able to be incorporated in a commercial version of the model, although there are significant challenges to be overcome first.

Ómar Frits Eriksson concluded by saying that 'IWRAP Mk2 is a flexible tool but please use it wisely'.

With regard to the next exercise, it was explained that a density map, sea chart and information about traffic would be provided.

For those who like programming, Erik Sonne Ravn then showed how changes can be made by modifying an .xml file, rather than using the graphical user interface. It was then observed that this would be one way of incorporating AIS information into the model.

END OF DAY

Day Four – IWRAP Mk2 (continued) & Simulation

The Chairman began the day by introducing the IALA IWRAP Wiki site (www.ialathree.org/iwrap). Ómar Frits Eriksson explained its contents and urged delegates to use it, including any user comments on the recently released commercial version. He then briefly mentioned the IALA Dictionary and other IALA Associated Wiki sites.

Ómar Frits Eriksson then gave a short presentation on Causation Factors and the use of Bayesian Networks. He explained that the work is very much in the developmental stage but that the expectation is that when finalised the process would be automated for each IWRAP leg.

Erik Sonne Ravn then gave a summary of the work on the Hatter Barn data undertaken the previous day and then briefed the next task; modelling the Strait of Hormuz.

8   SESSIONS 14 – 15

These sessions were chaired by Ómar Frits Eriksson and moderated jointly with Knud Benedict and Erik Sonne Ravn).

8.1   Real Case Studies

The exercise was an opportunity for the delegates to establish a route, based on charted data and extend their knowledge of the use of the various components of the IWRAP Mk2 tool. It naturally generated much discussion and need for advice from the experts.

Ómar Frits Eriksson introduced the exercise, files involved.

Erik Sonne Ravn talked the delegates through how to get started

The sequence of events followed during the exercise was to:

- Import charted data;
- Define coastline with polygons with depth = 0;
- Define route legs;
- Define lateral distributions on legs;
- Enter traffic volume into legs;
- Define relevant grounding [polygons];
- Run model;
- Assess results – modify model etc.

The development of the models for Hatter Barn and the Strait of Hormuz continued for the remainder of the session, with several issues being raised with the session supervising team.

The session ended with a survey of results from the delegate's construction and running the models they had developed.

9   SESSIONS 16 - 17   INTRODUCTION TO SIMULATION TECHNIQUES

The session was chaired by Ómar Frits Eriksson and led by Peter Sørenson (Force Technology).

Before the planned presentations were made, Roger Barker made a short presentation about the use of simulation in the UK, with regard to the planning for the development of large windfarms and the part being played by AIS data and IWRAP Mk2. He highlighted some of the issues arising from dependence on terrestrial AIS base stations and the

9.1   Introduction to various simulation tools and to IALA Guideline 1058

Peter Sørensen began with a brief overview of Force Technology before introducing IALA Guideline 1058 on the use of simulation as a tool for waterway design and AtoN planning, which it was emphasised is at a reasonably high level. A broad definition of simulation was given, from which it was concluded that IWRAP Mk2 can be considered to be a simulation tool.

The various types of simulation and their uses were described, together with their advantages and disadvantages, as was the need to ensure that those participating in simulation need to be suitably briefed. The importance of visualisation and the key role of projector technology were highlighted.

9.2   Use of simulators for AtoN design and planning in the future

Peter Sørensen, drawing on the previous presentation, asked "when commissioning simulation, can the simulator provide the required visualisation". From which it emerged that a further, more detailed Guideline may be required, so that commissioners of simulation for AtoN design can understand what a simulator may be able to do for them. The work involved will require consideration of projection technology, taking into account conspicuity and other features that were itemised. This initiated several practical comments about conditions that a simulator now needs to the able to represent and practical functionality that it will need to provide. However, there needs to be a recognition of what is technically feasible.

It was reported that work on the new Guideline is getting underway and that delegates could be expected to receive a questionnaire associated with its development.

9.3   Danish case. Use of simulation for the redesign of a fairway

Peter Sørensen began with setting the geographic scene and providing information on local conditions. It was explained that the project was set in the context of effectively extending the width of the waterway actually in use, bearing in mind a significant isolated lighthouse. This was thought possible due to analysis of the traffic and assessment of its draught, using AIS information. During initial development AtoN were used but had to be withdrawn, as some vessels were clearly unable to see them.

Simulation was commissioned, in accordance with IALA Guideline 1058, using two full mission simulators. The simulation predicted a successful outcome to the plan and work is now in hand to implement the changes but a decision is awaited about the removal of the lighthouse, which hinders the approach to the southern end of the main channel.

9.4   Discussion.

Peter Sørensen began by asking who was using simulation and the majority of delegates indicated that they were. There was a question about recreational vessels and the simulation of synchronised lights, which were likely to be at the side of the channel. It was said that this did not necessarily apply only to recreational vessels and the discussion then expanded to cover additional issues associated with synchronised lights.

Time was then found for Knud Benedict and Ómar Frits Eriksson to make a presentation about Area Traffic Density Plots and the way in which the random movement of non-AIS fitted vessels might be better modelled. The ensuing discussion started with consideration of fishing vessels, whose numbers can be ascertained, as can their general route to their fishing grounds and the fishing grounds themselves, but went on to cover dredgers and then more exotic vessels.

The discussion was followed by a briefing on Causation factors from Knud Benedict and the use of Bayesian networks.

END OF DAY

Day Five – Simulation (continued), Discussion & Closing

10   SESSION18   IALA RISK TOOLBOX IN THE ROUND

This session was chaired by Ómar Frits Eriksson, with support from Peter Sørenson.

Before the planned session began and at the request of the delegates. there was a briefing on the composition and structure of the folders used by IWRAP Mk2, which led to further discussion on some of the finer details of operating IWRAP (see the presentation 'IWRAP creating a model' in the IWRAP models folder.   From this emerged further potential improvements to the program emerged.

10.1   Environmental Stress Model

Delegates were encouraged to share completed models, so that more models can be analysed and the program improved.

Professor Yusuf Volkan Adogdo from Istanbul Technical University – Maritime Faculty, made a short presentation on an environmental stress model, developed by his Professor Inoue of Kobe University of Mercantile Marine (KUMM) and Japan Maritime Science (JMS).

10.2   The components of the IALA Risk Management toolbox and how they interact:

Ómar Frits Eriksson set the scene, using a presentation prepared jointly with Burt Lahn (USCG), programme leader for the PAWSA project.

A comparison was made between PAWSA and IWRAP Mk2.

10.2.1   IWRAP Mk2

It was accepted that IWRAP Mk2 can be considered as a simulation tool and that the current IALA Recommendation O-134 now needs to be updated. IWRAP Mk2 is still being developed but delegates would have seen that it is producing reasonable results.

It was suggested that use of IWRAP before a PAWSA would make its data available to the PAWSA workshop and would, therefore, inform the stakeholders. It was also indicated that the USCG may find additional applications (i.e. Port Access Routes studies) for the software.

10.2.2   PAWSA

Despite the obvious differences in timespan and resources required there are similarities between PAWSA and IWRAP Mk2 and the two processes do complement one another. Again it was asked, 'do you do an IWRAP analysis before or after a PAWSA workshop?' As a result of the subsequent discussion, an additional slide was created for the presentation and the answer to the question is 'possibly both'. The revised presentation is on the IALA ftp workshop server.

10.2.3   Simulation

Simulation can be used both before and after a PAWSA workshop and IWRAP assessment, as a feasibility and then validity mechanism. This found favour with the seminar. It was reported that MARIN is already combining simulations with risk analysis. This gave rise to a discussion about whether the simulation and risk assessment are conducted separately or together and the advantages and disadvantages of each approach.

There was an unresolved query about the relative costs of running a simulation and organising a PAWSA workshop, although some of the factors affecting the cost of simulation were raised and it was pointed out that a PAWSA workshop is scalable and that a preceding IWRAP analysis would be considered as an internal and not a workshop cost.

11   SESSION 19   SEMINAR DISCUSSION AND CLOSING OF THE SEMINAR

This session was chaired by Jean-Charles Leclair.

11.1   Seminar debrief

Ómar Frits Eriksson said that it was not his intention to run through the draft report; the current version of which was on a USB stick prepared for each of the delegates and also on the ftpworkshop server (see 11.2).   He showed the content of the USB stick, briefly.   It was intended that the draft report would be e-mailed to all delegates and also be posted on the IALA Workshop FTP server by 4 December; it would be available for comment until 11 December. Given the timing, the draft report would be used to brief the Council meeting to be held on 6-9 December 2011.

11.2   Presentation of certificates

At the session end a USB memory stick, containing electronic copies of all input programs, photographs and presentations, was provided to each delegate.   Mike Hadley said that all the material would also posted on the ftp workshop site and would remain there until the end of the year.   The co-ordinates for the ftp site are:

ftp://212.234.38.41

User name: ftpworkshop

Password   magdalena

Each delegate then received, from the assembled team of presenters, an Aids to Navigation, Level 1 certificate from the World-Wide Academy, indicating successful participation in the seminar.

11.3   Closing of the seminar

11.3.1   Remarks by IALA

Jean-Charles Leclair said that the idea of combining PAWSA, IWRAP and simulation was a good one and would enable national authorities to better meet their obligations under SOLAS. As the majority of delegates were technical specialists he said that it is important that the word about the seminar is spread to colleagues, some of whom will have regulatory responsibilities and this is given added emphasis by the approaching mandatory IMO audit scheme.

The input from IALA members to the development of the Risk Management Toolbox was acknowledged but the need to consider the funding for future development needs to be borne in mind.   This is best done by using the toolbox.

It was commented that a methodical presentation of a risk model can be helpful when seeking funding.

He gave thanks to all the presenters, with special thanks for the input from Ómar Frits Eriksson.

Presentations to each of the presenters had been made during the seminar dinner.

11.3.2   Closure

Jean-Charles Leclair concluded proceedings by thanking everyone for their participation and hard work, saying that he hoped that they had all benefited from the week.   He then wished everyone a safe journey home and expressed his hopes that he would soon see the results of their endeavours in the increased use of the IALA Risk Management toolbox.   The seminar was then declared closed.

ANNEX A   LIST OF PROGRAMS DOCUMENTS & PRESENTATIONS PROVIDED TO DELEGATES

PAWSA Documents

1   PAWSA Workshop Guide

IWRAP Program

1   iwrap_mk2_setup_v3_4_0.exe

2   Strait of Hormuz

3   Hatter Barn

Test Cases

1   Test Case A.xml

2   Test Case B.xml

3   Test Case C.xml

4   Test Case D.xml

5   Test Case E.xml

Presentations

1   IALA Introduction.pptx

2   Seminar brief - FTP

3   IALA Risk Management Toolbox Introduction.ppt

4   PAWSA General overview.ppt

5   PAWSA Logistical planning.ppt

6   PAWSA Goals & objectives.ppt

7   PAWSA Roles & responsibilities.ppt

8   PAWSA Data sources

9   PAWSA Facilitation techniques

10   PAWSA Use of ECS.ppt

11   PAWSA Workshop report.ppt

12   IWRAP theory & test cases.ppt

13   Simulation - Practical simulation-windfarms

14   Simulation - Present status and guidelines.ppt

15   Simulation Use case - Redesign of Drogden Channel

16   Environmental Stress Model

     a.   Paper by Prof. Dr. Inoue – ES Model

     b.   Article from RIN Journal – ES Model

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ANNEX C   PROGRAMME

IALA TRAINING SEMINAR ON RISK MANAGEMENT:

PAWSA, IWRAP Mk2 & SIMULATION
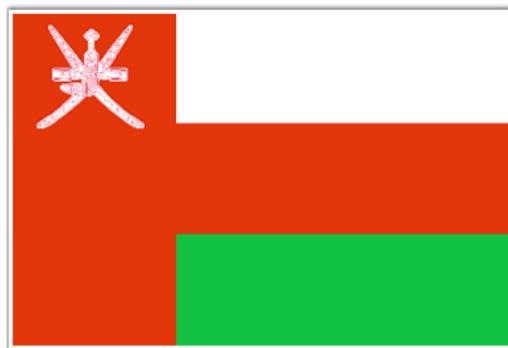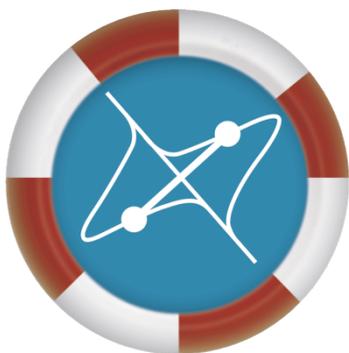
27 November – 1 December 2011

Crowne Plaza
P.O. BOX 1455 - RUWI 112
MUSCAT, 112
OMAN

DAY 1 - SUNDAY 27 NOVEMBER 2011

Time	Activity	
0900 - 1000	**Registration / Welcome tea or coffee**	
1000 - 1040	**Session 1 - Opening of the Seminar**	**Chair: Jean-Charles Leclair**
	Welcome from Oman Welcome from IALA Introduction to IALA and the WWA	Khalil Al Balushi, General Manager Arabian Maritime & Navigation Aids Services Jean-Charles Leclair, Dean of IALA WWA Jean-Charles Leclair
1040 - 1100	**Break**	
1100 - 1130	**Session 2 - Presentations**	**Chair: Jean-Charles Leclair**
	Administration (Health & Safety Brief) Introduction to the IALA Risk Management Toolbox	Mike Hadley - Technical Co-ordination Manager IALA Ómar Frits Eriksson (DaMSA)
1130 - 1300	**Session 3 – PAWSA**	**Chair: Ómar Frits Eriksson**
	General overview Pre-PAWSA logistical planning PAWSA goals and objectives	Ómar Frits Eriksson Ómar Frits Eriksson Ómar Frits Eriksson
1300 - 1400	**Lunch**	
1400 - 1530	**Session 4 – PAWSA (continued)**	**Chair: Ómar Frits Eriksson**
	Roles and responsibilities of the seminar sponsor, lead facilitator and support staff Identifying data sources and compiling port statistical information for presentation during the facilitation process	Ómar Frits Eriksson
1530 - 1600	**Break**	
1600 - 1730	**Session 5 – IWRAP Mk2 – General overview**	**Chair:** Ómar Frits Eriksson

1800 – 1900 Welcome reception at Crowne Plaza – Garden area (Drinks and Finger Buffet will be served).

Free evening

DAY 2 - MONDAY 28 NOVEMBER 2011

Time	Activity	
0900 - 1030	**Session 6 – PAWSA (continued)**	**Chair:** Ómar Frits Eriksson
	Administrative Details (as required)	Mike Hadley
	Data sources and methods, facilitation techniques & risk factors	Ómar Frits Eriksson
1030 - 1100	**Break**	
1100 - 1230	**Session 7 – PAWSA (continued)**	**Chair: Ómar Frits Eriksson**
	Preparation and content of the assessment seminar report	Ómar Frits Eriksson
1230 - 1400	**Lunch**	
1400 - 1530	**Session 8 – IWRAP Mk2**	**Chair: Ómar Frits Eriksson**
	Introduction to IWRAP Mk2	Ómar Frits Eriksson
1530 - 1600	**Break**	
1600 - 1700	**Session 9 – IWRAP Mk2 (continued)**	**Chair: Ómar Frits Eriksson**
	Programme Installation & Licensing Scheme	Per Engberg (Gatehouse)

Free evening
Optional museum visit - Zubair House Museum (approximately 1700)

DAY 3 - TUESDAY 29 NOVEMBER 2011

Time	Activity	
0900 - 1030	**Session 10 – Simple cases running IWRAP Mk2**	**Chair: Ómar Frits Eriksson**
	Administrative Details (as required)	Mike Hadley
	The theoretical foundation behind IWRAP Mk2 (Part 1) IWRAP Test Cases A – B – C (Collisions)	Knud Benedict (Wismar University) & Erik Sonne Ravn (DMA)
1030 - 1100	**Break**	
1100 - 1230	**Session 11 – Simple cases running IWRAP Mk2 (Continued)**	**Chair: Ómar Frits Eriksson**
	The theoretical foundation behind IWRAP Mk2 (Part 2) IWRAP Test Cases D-E (Groundings)	Knud Benedict & Erik Sonne Ravn
1230 - 1400	**Lunch**	
1400 - 1530	**Session 12 – More complex cases running IWRAP Mk2**	**Chair: Ómar Frits Eriksson**
	Introduction of the differences between the free and commercial versions of IWRAP Mk2. Overview of an IWRAP Analysis using Hatter Barn Case: - Defining area to be analysed - Gather information (charts, traffic volume, casualty data) - Using Sea Chart Overlays - Polygon Generation - Defining route legs - Allocating traffic to route legs - Performing baseline analysis - Performing What-If analysis	Knud Benedict & Erik Sonne Ravn
1530 - 1600	**Break**	
1600 - 1730	**Session 13 – More complex cases running IWRAP Mk2 (Continued)**	**Chair: Ómar Frits Eriksson**

Seminar Dinner – Al Bustan Palace Hotel
Transport provided from / to hotels – details to be briefed at seminar
Dress Code: Smart Casual

DAY 4 - WEDNESDAY 30 NOVEMBER 2011

Time	Activity	
0900 -1025	**Session 14 – Real Case Studies using IWRAP Mk2**	**Chair: Ómar Frits Eriksson**
	Administrative Details (as required)	Mike Hadley Knud Benedict & Erik Sonne Ravn
1025 – 1100	**Break & Seminar Group Photograph**	
1100 – 1230	**Session 15 – Real Case Studies using IWRAP Mk2 (continued)**	**Ómar Frits Eriksson**
		Knud Benedict & Erik Sonne Ravn
1300 – 1400	**Lunch**	
1400 – 1530	**Session 16 – Introduction to simulation techniques**	**Ómar Frits Eriksson**
	Introduction to various simulation tools and to IALAs Guideline 1058 on the use of simulators for design of waterways and planning of AtoN	Peter Sørensen (Force Technology)
1530 – 1600	**Break**	
1600 – 1730	**Session 17 – Simulation techniques (continued)**	**Ómar Frits Eriksson**
	Use of simulators for Aton design and planning in the future	Peter Sørensen
	Discussion and participants input to features important and relevant to include in future development of simulation tools used for AtoN planning and design	Roger Barker, Peter Sørensen

Free evening

DAY 5 - THURSDAY 1 DECEMBER 2011

Time	Activity	
0900 – 1030	**Session 18 – IALA Risk toolbox 'in the round**	**Chair: Ómar Frits Eriksson**

0900 - 0930	Administrative Details (as required)
	
	The components of the IALA Risk Management toolbox and how they interact:
	     IWRAP Mk2
	     PAWSA
	     Simulation
		Mike Hadley
		Omar Frits Eriksson

1030 – 1100	**Break**	
1100 – 1230	**Session 19 – Seminar discussion & Closing**	**Chair: Jean-Charles Leclair**
	Discussion & Seminar Debrief Presentation of certificates Closing of the seminar	Ómar Frits Eriksson Jean-Charles Leclair Peter Sørensen Roger Barker Ómar Frits Eriksson Jean-Charles Leclair Knud Benedict Per Engberg Ómar Frits Eriksson Jean-Charles Leclair Jean-Charles Leclair
1230 – 1400	**Lunch**	

ANNEX D   VISITS & SOCIAL EVENTS

1   On Sunday, 27 November, a welcome reception, hosted by AMNAS, was held at the Crowne Plaza hotel.

2   On Monday, 28 November, an early morning visit was arranged to the Sultan Qaboos Grand mosque.

3   On Monday, 28 November, an evening visit was arranged to the Zubair House Museum.

4   On Tuesday 29 November, a seminar dinner, hosted by AMNAS, was held at the Al Bustan Palace hotel.