

GUIDELINE

G1092

SAFETY MANAGEMENT FOR AtoN ACTIVITIES

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1. INTRODUCTION

This IALA guideline provides an overview and practical guidance to managing safety in the AtoN work place.

Worker safety, protection of the public and the marine environment should be of paramount importance to AtoN authorities and service providers when carrying out aids to navigation maintenance and project work.

Different countries have varying requirements and laws that deal with workplace health and safety, and an organisation should show a strong commitment to comply with the relevant local, national and international laws, regulations, standards and codes of practice in their area of operation.

Therefore, this guideline will not provide a definitive framework for safety management, but rather a general guide on the development, implementation, monitoring, review and auditing of safety management systems.

In providing guidance, the word ‘should’ is used in this guideline to indicate a course of action.

1.1. AIM

The aim of this guideline is to provide a general guide to:

- principles behind effective safety management;
- framework of safety management plans, including the development, possible contents and possible methods of review, implementation and auditing of such plans;
- assessment and management of the risks in the AtoN workplace.

Note: AtoN authorities and service providers should refer to their local legislation for specific compliance requirements for all aspects of their safety management systems.

2. PRINCIPLES OF SAFETY MANAGEMENT

All persons have a duty to ensure health and safety, to ‘manage risks’ by eliminating health and safety risks so far as is reasonably practicable, and if it is not reasonably practicable to do so, to minimise those risks so far as is reasonably practicable.

Persons conducting a business or undertaking will have health and safety duties to manage risks if they engage workers to undertake work for them, put other people at risk from the conduct of their business or undertaking, design, manufacture, import or supply plant, substances or structures or install, construct or commission plant or structures at a workplace.

Deciding what is ‘reasonably practicable’ to protect people from harm requires taking into account and weighing up the likelihood of the hazard or risk concerned occurring, the degree of harm that might result; the availability of suitable ways to eliminate or minimise the risk.

Health and Safety legislation imposes strict duties on key stakeholders in the workplace to ensure there is an acceptable level of health and safety. These duties are sometimes called the general duties of care. Implementing that duty of care principle means planning for the prevention of workplace accidents, injuries and illnesses. This often requires organisations to ensure that:

- health and safety risks are identified, assessed, controlled, monitored and reviewed;
- effective communication, consultation and cooperation strategies are implemented to engage workers in health and safety matters;
- information, education and training, instruction or supervision is provided through formal and informal arrangements;
- the health of workers and the conditions in the workplace are monitored;



- information systems collect health and safety data to ensure effective planning and decision making.

3. SAFETY MANAGEMENT PLANS / SYSTEMS

3.1. THE TERM 'SAFETY MANAGEMENT PLAN'

The term Safety Management Plan has been adopted for this guideline in order to broadly classify a method of managing safety in the AtoN workplace, but could also refer to:

- Occupational Health and Safety Management Plans or Systems;
- Safety Policies;
- Safety Management Systems;
- Safe Work Procedures or other guidelines related to workplace health and safety.

As stated in section 1, this guideline understands that different legislations, organizations and situations all require a different approach to safety management, and therefore provides only an outline of what might be constituted as possible content or generally considered as minimum requirements.

3.2. SAFETY MANAGEMENT POLICY

Relevant legislation, laws, standards or codes practice should be considered by the organization when developing or reviewing a Safety Management Policy, to ensure compliance.

A Safety Management Policy is a high-level document that outlines an organisation's approach to safety management and should provide:

- general direction, focus and key goal(s);
- responsibilities of all levels of employees within the organisation;
- a 'Statement of Commitment' to relevant work health and safety legislation, laws, standards or codes of practice, as far as is practicable;
- minimising and where possible elimination of safety risks;
- implementation of plans and systems required, for operational activities.

3.3. COMPONENTS OF A SAFETY MANAGEMENT PLAN

A Safety Management Plan (SMP) is an effective and documented method of encapsulating the outline, principles, methods and review procedures of safety management for a particular operation or project.

The level of detail in an SMP is normally dictated by the complexity of an organisation's operations and the legislations and standards of each particular country.

In the case of AtoN activities, a SMP would be as broad as the field of activities required, but as a minimum should include:

- method statement / aim;
- references to relevant legislation, standards, instruments, policies etc.;
- roles & responsibilities;
- identification of specific work activities;
- hazard identification and risk management;
- communication, consultation and co-operation strategies;



- safe work procedures / work guidelines;
- job safety analysis;
- Personal Protective Equipment (PPE);
- emergency preparedness and response;
- incident reporting and other safety related reports;
- auditing.

3.3.1. METHOD STATEMENT / AIM

The method statement / aim of the document should be used for identifying and documenting the general scope of activities and the guiding policies, principles and goals.

3.3.2. REFERENCES TO RELEVANT LEGISLATION, STANDARDS, INSTRUMENTS, POLICIES, ETC.

A reference should be made to the legislative requirements and documentation that may guide, affect or provide other controls over the SMP.

3.3.3. ROLES & RESPONSIBILITIES

Identification of all personnel or roles involved in the set of AtoN activities for which the SMP needs to be formulated. It is sometimes helpful to list all roles and responsibilities in a matrix or chart that list and cascade all information from top-level management down, allowing for easy reference and review.

3.3.4. IDENTIFICATION OF SPECIFIC WORK ACTIVITIES

A SMP should identify the key work areas, tasks, and other activities that are covered by the SMP and should also identify the various responsibilities within those tasks, either on an individual or departmental basis.

3.3.5. COMMUNICATION AND CONSULTATION

Organisations are required to consult with their workers about health and safety issues. However, consultation should be viewed as more than just a legal requirement. It is a valuable means of improving decision-making about health and safety matters. Employee feedback is a valuable tool in improving health and safety in the workplace.

Effective inductions, regular safety themed meetings, formation of safety committees, publishing of safety statistics and regular consultation with all employees are positive means and methods of achieving this.

The process of inducting people into the workplace is an effective way of communicating policies and procedures to all personnel so there is a common level of understanding of the organizations workplace safety goals. Inductions should not only be carried out for new employees, but refresher inductions should be used when there is a change in circumstances or a significant change in policies and procedures.

3.3.6. REPORTING / SAFETY STATISTICS

An essential element in every safety management system is reporting and provision of safety statistics. While an effective safety reporting system can be difficult to achieve, there are four issues critical to a successful safety reporting system:

- 1 Everyone from top management on down must understand and participate in safety reporting.
- 2 There must be effective methods in place to collect and analyse data that has been collected.
- 3 The company culture must be conducive to the comfort level required for employees to report flaws in a company's safety management policy and procedures as well as personal shortcomings.
- 4 Positive safety reporting. Reporting on positive safety indicators, such as safety improvements, can sometimes be more beneficial than incidents. Fostering a positive safety culture can decrease incidents and increase awareness.



The difficulty is balancing the reporting of incidents to ensure that it is 'quality' driven rather than 'quantity' but in any event the opportunities for continuous improvement are not overlooked.

3.3.7. SAFE WORK PROCEDURES / WORK GUIDELINES

Risk assessments allow identification of risks and the required control measures needed to mitigate or reduce those risks. The method of applying those control measures needs to be formalized and made available to all personnel. A common way of documenting this is through a Safe Work Procedure (SWP), which may also be referred to as Safe Work Method Statement (SWMS).

This document is a simple and documented approach of outlining the safest way to complete a particular task. It identifies and lists the hazards involved. It also provides a stepped guide to completing a task with the various measures in place to prevent an incident or injury occurring.

Safe Work Procedures provide information to assist personnel to perform tasks safely. The implementation of the safe work procedure relies on the individual to follow the requirements as set out in the document. Training and awareness in that regard is important.

Safe Work Procedures also assist in the training and orientation of new staff in the hazards present in the operations, as well as providing them with the preferred way to safely perform the task/activity. Safe Work Procedures may also be used in assessing the level of understanding with regards to on-the-job training.

In the AtoN context, SWP can be created for a specific AtoN location, specific tasks involved in construction or maintenance of the AtoN or for operations in general.

Many components of a Safe Work Procedure are reliant on the relevant laws, legislations, regulations or codes of conduct. The government bodies responsible for workplace or occupational health and safety will usually have working templates for Safe Work Procedures, which outline a compliant format.

3.3.8. TOOL BOX MEETINGS

Tool Box Meetings (TBM) are an informal forum for discussion amongst a group of employees involved in the same activity or task, or the same work area.

Whilst the exact format of a TBM can vary, they are specifically designed to be short, informative and to the point discussions about the following activity, shift or day. They are usually held 'on-the-job' or in the workplace, and are an important and useful way of keeping health and safety at the forefront of workers' minds.

TBMs are a useful mechanism for conducting training on safety topics. TBMs should be considered as a discussion and not a lecture, allowing full participation from all members of the discussion team. TBMs are generally recorded in a pre-approved format and signed by all participants.

TBMs should be made a mandatory part of all AtoN operations, considering the level of risk inherent in working in some marine environments and should be held regularly to reinforce an organisation's philosophy that job safety is important.

3.3.9. JOB SAFETY ANALYSIS

A Job Safety Analysis (JSA) is a method that can be used to identify, analyse and record a very specific task or activity and is carried out on a regular basis. The JSA can also be a valuable tool for training new employees in the steps required to perform their jobs safely.

A JSA is very similar in concept to a Risk Assessment. Whereas a Risk Assessment may be carried out for development of a SMP, the JSA may be carried out for one particular task during the current work shift. JSA are very similar to a TBM but is more focused on identifying the risks for one very specific activity.

A JSA focuses on the relationship between the workers, the task, the tools and the work environment. Ideally, after uncontrolled hazards & associated risks have been identified, steps shall be taken to eliminate or reduce them to an acceptable risk level.



3.3.10. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal Protective Equipment, commonly known as 'PPE', has the main purpose of supplementing other means of hazard control. PPE act as a frontline barrier to protect or shield a person from unnecessary exposure to hazards on the job.

PPE are generally clothing, equipment or other items such as high visibility clothing, safety boots, helmets, safety glasses, and ear plugs. PPE are used by a person employed in a hazardous undertaking for safety against injury from a majority of dangerous elements. It is made to protect a person's body such as limbs, head, face, eyes, nose, ears and several internal organs. Since it is mainly built to protect the integrity of a worker's body, quite a few regulations and statutes are passed imposing use of such protective equipment. AtoN authorities and private organization should consult the relevant authorities for details of how to be compliant in the supply and use of PPE.

PPE choice is dependent on the task to be undertaken. Whilst some PPE, such as steel-capped safety boots, may be mandatory for the vast majority of AtoN activities and workspaces, other PPE will be required according to the type of activity to be undertaken. For instance, safety harnesses would only be required for any work undertaken at a height set by the relevant standards, and safety goggles, gloves and respirator masks may be required for painting or restoration works.

3.3.11. EMERGENCY PREPAREDNESS AND RESPONSE

Emergency procedures are plans specifically designed or tailored for handling emergencies and unforeseen events that may occur on a site or in a workplace, including, but not limited to, injuries resulting from falls, fires, explosion, release of hazardous materials and changes in weather conditions.

An Emergency Procedure should be a documented procedure that is published and communicated to all workers involved in a particular area or working on a particular project or site.

Emergency Procedures should be reviewed and as necessary revised to maintain, so far as is reasonably practicable, a work environment that is without risks to health and safety. Any revisions to an Emergency Procedure should be published and communicated to all relevant workers.

Legislation, laws, standards or codes of practice for a country usually specify the requirements of compliant safety response and AtoN authorities or private organizations should seek guidance from the relevant government authority regarding their obligation in regards to emergency response.

3.3.12. INCIDENT REPORTING

Incident Reports are documented reports of an incident or accident that has occurred; for example; workplace injury/illness, dangerous occurrence, or hazardous substances exposure.

Incident Reports should be submitted without delay to ensure appropriate action is taken and the source of the incident has been addressed.

An Incident Report is triggered by an incident or accident and involves a detailed investigation and response.

There are different levels of classifications, and the type of classification to use would usually be specified in legislation, standards or codes of practice specific to the country. Examples of classifications would be:

- safety infractions or infringements;
- near misses;
- first aid injuries;
- medical treatment injuries;
- lost time injuries;
- fatalities.



The management and reporting of incidents and effective follow up with corrective action plans or Safe Work Procedures form an important part of continuous improvement of safety systems within an organization. Incident reporting allows an organization to identify shortfalls or failures in their safety management systems, and provides a very important source of safety statistics, which many authorities and private organizations are required to record and analyse. Without such data or such a reporting system, an organization's management system can and will often fail to perform relatively to set objectives and targets relating to its Safety Management Plan.

3.3.13. AUDITING

Regular auditing is a keystone to the success of any management system, and this is no different for safety management. It is important to state the objectives of auditing a safety management system and to approach it in a detailed and documented manner. A safety management system audit will ensure that:

- the safety management system is compliant and refers to the relevant and current legislation, laws, standard, codes of practice or other safety requirements;
- Risk Assessments have been carried out according to schedules or at junctions as specified by the policy or relevant management plan;
- the Safe Work Procedures are current and relevant and that the system of review and document tracking has been followed and that the most updated copies of the SWP are available to the work force;
- the control measures identified in the risk assessment process are in place and being practiced;
- the incident reporting framework is operational and that there is an adequate level of incident reporting and review in place;
- any identified non-compliances or failures in the safety management system are resolved.

Auditing is the best way for managers and organizational leaders to demonstrate due diligence and also to identifying areas of good practice that may be used elsewhere in the organization.

Government bodies or authorities responsible for safety management will often be able to provide the framework or requirements for compliant auditing. In some cases, 3rd party auditing of a company's safety management may be mandatory.

3.3.14. MONITORING AND EVALUATING PERFORMANCE

Effective auditing of a safety management system should provide an organization with the information required to monitor and evaluate performance, and more importantly, identify areas where improvement is required. Some of the key measures used for monitoring performance could include the following;

- 1 The number of incidents recorded by an organization allows identification of the areas of their operation in which incidents are prevalent. Emphasis on correct classification also allows the organization to identify any particular activities resulting in incidents. This in turn allows review of the relevant risk assessment or procedures pertaining to that activity.
- 2 The quantity, frequency and duration of safety audits that an organization undertakes is a good indicator of the emphasis placed on improving workplace safety and monitoring of compliance.
- 3 The number of safety training programs, awareness sessions, general consultations and the resultant feedback of such activities can show how effectively the safety policies, goals and objectives are communicated to the workforce and whether workforce feedback is acted upon.

4. RISK ASSESSMENT OF WORK ACTIVITIES

This section deals with the risk assessment process in detail.



Any safety management system or SMP should either provide a detailed risk assessment of the various work activities, or the process and mechanism by which the risk assessments should be carried out.

A risk assessment considers the consequences of someone being exposed to a hazard and the likelihood of it happening. It can be undertaken with varying degrees of detail depending on the type of hazards and the information and resources that are available, and involves a four-step process.

4.1. IDENTIFY THE HAZARDS

Hazard identification in the AtoN work place involves identifying all situations and events that could potentially cause injury or illness to workers, contractors, visitors or the public.

It is important to try and anticipate all possible hazards with a 'what if' approach. Identify and class the hazards into different types; for example, physical, mechanical and/or electrical, chemical, biological and psychosocial environment. Hazards can be part of the work process, such as mechanical hazards, noise or toxic properties of substances, or result from equipment or machine failures, chemical spills and structural failures. A sample hazards table is provided in Table 1.

A piece of plant, substance or a work process may have many different hazards but each needs to be identified and listed.

An organisation should review injury and illness records, workplace incidents, near misses, worker feedback, sick leave and the results of any inspections and investigations to identify hazards.

An organisation should review available information and advice about hazards from regulators, and industry associations. Manufacturers and suppliers can also provide information about hazards and safety precautions for specific substances (safety data sheets), plants or processes (instruction manuals).

Table 1 *Example of a Table of Common Hazards*

Hazard	Potential harm
Manual Tasks	Over exertion or repetitive movement can cause muscular strain
Gravity	Falling objects, falls, slips and trips of people can cause fractures, bruises, lacerations, dislocations, concussion, permanent injuries or death
Electricity	Potential ignition source Exposure to live electrical wires can cause shock, burns or death from electrocution
Machinery and equipment	Being hit by moving vehicles or being caught by moving parts of machinery can cause fractures, bruises, lacerations, dislocation, permanent injuries or death
Hazardous chemicals	Chemicals (such as acids, hydrocarbons, heavy metals) and dusts (such as asbestos and silica) can cause respiratory illnesses cancers or dermatitis
Extreme temperatures	Heat can cause burns, heat stroke or fatigue. Cold can cause hypothermia or frost bite
Noise	Exposure to loud noise can cause permanent hearing damage
Radiation	Ultra violet light, welding arc flashes, microwaves and lasers burns, cancer or blindness
Biological	Micro-organisms can cause hepatitis, legionnaire's disease, Q fever, HOV/AIDS or allergies
Psychosocial hazards	Effects of work related stress, bullying, violence and work-related fatigue

4.2. ASSESS THE RISKS

Risk assessments should be based on a particular activity or work area and the risks and consequences should be assessed through use of a Risk Matrix. An example of a risk matrix is given in Figure 12. A risk assessment should involve:

- studying the activity and identifying the risks present;
- assessing those risks through a risk quantifiable matrix;
- identifying the measures required to mitigate and resolve those risks;
- identifying the residual risk and formulating suggestions.

An example of the process is provided in Figure 21.

Likelihood and Consequence Severity Matrix

Likelihood or frequency/probability	Consequence Severity				
	Low	Minor	Moderate	Major	Extreme
Almost Certain	Significant	Significant	High	High	High
Likely	Moderate	Significant	Significant	High	High
Moderate	Low	Moderate	Significant	High	High
Unlikely	Low	Low	Moderate	Significant	High
Rare	Low	Low	Moderate	Significant	Significant

Figure 1 Example of a Risk Matrix

4.3. CONTROL THE RISKS

The risk assessment must indicate what control measures are to be used to minimise potential for injury to employees and contractors or damage to plant and equipment. In some cases, control measures should also be selected in accordance with the hierarchy of control, which is (in priority order): elimination, substitution, isolation, engineering, administration and personal protective equipment. The way of controlling risks is ranked from the highest level of protection and reliability to the lowest as shown in Figure 12. This ranking is known as the hierarchy of risk control.

A general representation of the hierarchy of control is provided in Figure 33.

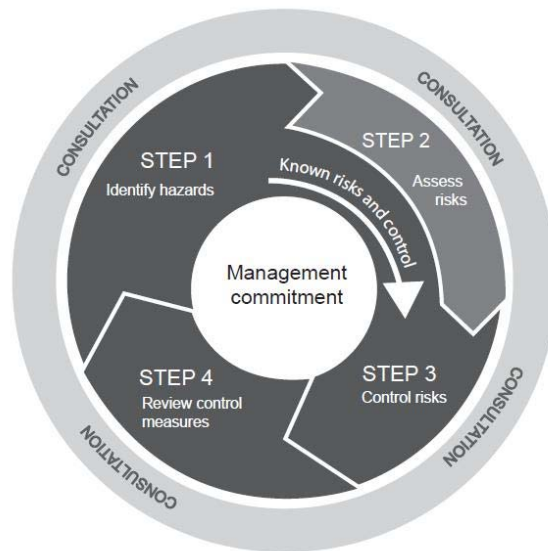


Figure 2 *Risk Assessment Process*

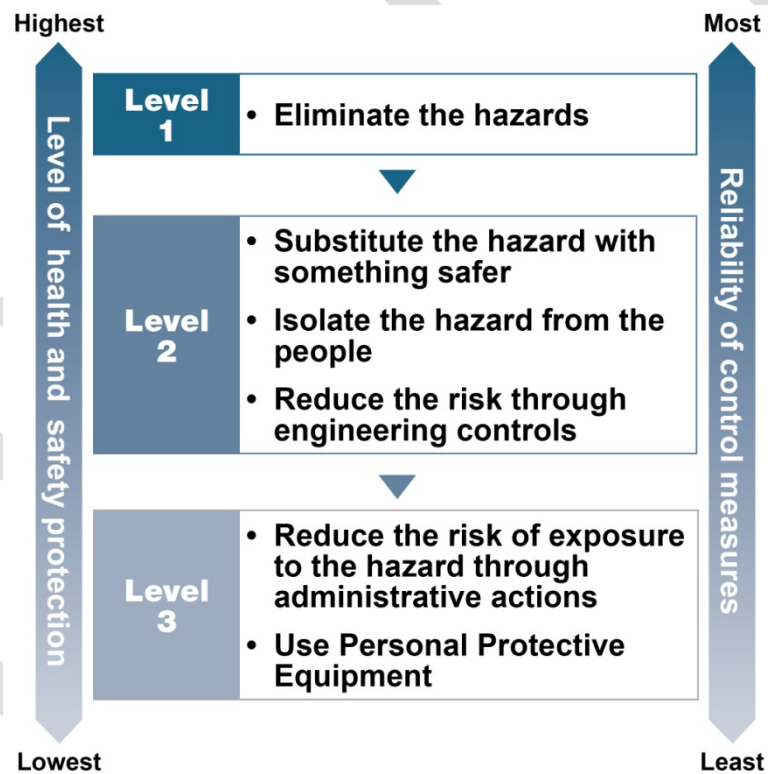


Figure 3 *Risk Hierarchy*



5. TERMINOLOGY

5.1. SOME KEY TERMS

Hazard	The potential for harm, or adverse effect on anyone's health at or near a workplace. Hazards vary greatly depending on the scope of activities, but in the context of AtoN may include: noisy machinery, sea state, chemicals, electricity and working at heights.
Risk	The possibility that harm (death, injury or illness) might occur when exposed to a hazard. The severity of the hazard, duration and frequency of exposure will determine the level of risk.
Risk control	Taking action to eliminate health and safety risks so far as is reasonably practicable, and if that is not possible, minimising the risks so far as is reasonably practicable. Effective risk control involves establishing and maintaining systems that give opportunity for regular evaluation and review procedures.

6. ACRONYMS

JSA	Job Safety Analysis
PPE	Personal Protective Equipment
SMP	Safety Management Plan
SWMS	Safe Work Method Statement
SWP	Safe Working Procedure
TBM	Tool Box Meeting