

## IALA GUIDELINE G1077



**IALA Guideline G01077** gives guidance on the maintenance of AtoN and information to help develop an adequate maintenance strategy.

In the two first parts of this series we will explore and explain guiding principles to assist the overall Aton maintenance strategy, then, on the last article we will present the different types of maintenance strategies that can be adapted to these principles.

### PRINCIPLE 2: DESIGN FOR MAINTENANCE

Maintenance cost are the most significant part of the cost of ownership for a given AtoN, and the majority of maintenance costs are defined or caused by the equipment/system own design. Therefore, it is crucial to take into account future maintenance cost on the design phase, with the following objectives:

- Reduce maintenance
- Extend time intervals
- Enable maintenance upon the evidence of need
- Facilitate maintenance tasks
- Reduce the logistics needed

To achieve this, we must design the system ensuring that the following characteristics are key components of the system:

- **RELIABILITY:** Operating without failure
- **MAINTANABILITY:** Ease, speed, and accuracy to restore to its operating conditions.
- **SUPPORTABILITY:** Efficiency providing the various logistics supports to maintain the system (personnel, facilities, processes, tools, parts).

**NOTE:** Additional information to reach these characteristics can be found on G01077 Guideline.



*Maintainability should be “designed into” the equipment.*

*These attributes should be “designed into” the equipment, it is therefore crucial that manufacturers and AtoN providers take into account maintenance requirements upon system design.*

### PRINCIPLE 3: MINIMISE IMPACT ON THE ENVIRONMENT

*The impact of the environment must be reduced as possible in any AtoN operation. The goal of any AtoN provider is to ensure that movements of vessels are safe, expeditious and cost effective while protecting the environment. Impact on the environment can be reduced through:*

- *Extending intervals between site visits.*
- *Planning activities to take into account wildlife seasons.*
- *Reducing use and storage of environmental-hazardous material.*
- *Reducing reliance in air and sea heavy lift machinery.*
- *Optimizing disposal/recycling of materials.*

**NOTE:** *Additional information on this topic is available in IALA Guideline 1036, On Environmental Considerations in AtoN Engineering.*

*Relying on heavy lift operations implies high operational and environmental costs.*

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**PRINCIPLE 4: COMPLY WITH LEGISLATION AND INTERNATIONAL STANDARDS**

AtoN authorities are required to ensure that AtoN maintenance is carried out in compliance with IALA, IMO SOLAS and local legislation.

Authorities may need to include the following in their maintenance strategy:

- Environmental considerations
- Safety considerations and regulations
- Heritage AtoN and their structures may require especial attention
- Reference to relevant standards on the design phase

**PRINCIPLE 5: CONSIDER HEALTH AND SAFETY OF WORKERS AND PUBLIC**

Many of the activities included in a AtoN maintenance plan have strict worker health and safety requirements. The health and safety of workers and the public is of paramount importance. Maintenance plans should include training and awareness programs to ensure that all personnel is capable and trained on the activities they carry out. It is also essential that equipment design take into consideration the subsequent maintenance risks, if any maintenance activities are to risky corrective procedures should be applied.



*Specific training and adequate work conditions should be established from maintenance planning phase.*

**PRINCIPLE 6: ASSESS AND IMPROVE PERFORMANCE**

A continuous assessment of reliability, maintainability, and supportability will allow the continuous improvement of equipment and processes. This includes a maintenance record and feedback from maintenance operators.

A better analysis and diagnosis of the system is possible if a quality management system is implemented (ISO9001).