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Agenda item [[2]](#footnote-2) 7.2

Technical Domain / Task Number 2 1.5.2

Author(s) / Submitter(s) CHINA MSA

Proposal on Incorporating the QMS Process Case for AtoN Management from CHINA MSA into the G1052 Draft Guidelines

# Summary

This paper outlines the key quality management processes, illustrated through a workflow diagram, which are implemented by aids to navigation (AtoNs) departments of China in providing navigation services and managing the operation and maintenance of aids to navigation facilities. It serves as a reference for the revision of the Guideline G1052 *QUALITY MANAGEMENT SYSTEMS FOR AIDS TO NAVIGATION SERVICE DELIVERY* and proposes the incorporation of the processes diagram into the annex of the guideline.

## Purpose of the document

Response to the requirement of Task 1.5.2 on the Revision of Guideline G1052, Sharing the key processes and practical experience of China in the field of Quality Management System (QMS) for AtoNs.

## Related documents

1. ARM17-11.2.2 Liaison note to all Committees on QMS Best Practice
2. ARM17-12.1 Report of ARM17
3. ARM19-12.1 Report of ARM19

# Background

The China Maritime Safety Administration (CHINA MSA) is the competent authority for marine aids to navigation in China, currently administers a total of 11,329 public AtoNs of various types. All levels of AtoN management departments under its jurisdiction have established and effectively operate quality management systems.

A liaison note to all Committees on QMS Best Practices for AtoN service delivery was adopted at ARM17, requesting IALA members to provide their best practice cases on the implementation of QMS. This initiative aims to enable the task group to gain a broader understanding of how different AtoN agencies operate their QMS, thereby supporting the subsequent revision of Guidelines G1052.

The two case studies included in the annex of the Draft Guideline G1052 provide a highly professional overview of the main procedures and sub-procedures involved in the deployment and optimization of AtoNs. The draft guideline also introduces the fundamental logic underpinning the operation of a QMS, namely the basic concept of the "PDCA" (Plan-Do-Check-Act) cycle. However, the current presentation of this core logic does not clearly integrate with the AtoN management business processes, which limits the readability and comprehensibility of the guideline to some extent.

# Discussion

The purpose of establishing and operating a quality management system by AtoN management agencies is to consistently provide reliable navigation assistance services to users, ensure that service quality complies with standards and regulations, and identify challenges and opportunities for improvement through internal and external audits, process compliance monitoring, and risk management. The administrative regulation *Measures for the Administration of Coastal Aids to Navigation* issued by the Ministry of Transport of the People's Republic of China clearly stipulates that "*units responsible for the maintenance of coastal aids to navigation shall establish a quality assurance system for coastal aids to navigation maintenance.*"

AtoN departments under CHINA MSA generally establish and operate their QMS based on the ISO 9000 series standards and relevant legal and regulatory requirements. The documentation structure of the QMS follows a hierarchical framework, comprising the following components from top to bottom:

1. **Quality Manual**: Defines the organization’s quality policy, objectives, and targets. Serves as the overarching document aligning the system with ISO 9000 principles and legal mandates.
2. **Procedures**: Specify the operational workflows required for fulfilling organizational duties. Ensure standardized execution of core processes (e.g., aids deployment, maintenance, emergency response).
3. **Guidelines/Work Instructions**: Outline the laws, regulations, industry standards, and internal rules and regulations that must be adhered to during operations. Provide actionable references to external requirements (e.g., laws, national mandatory standards) and internal rules.
4. **Job Responsibility Manual**: Clarifies roles and responsibilities for specific tasks and posts.
5. **Document List and Update Logs**: Track all system documents and their revision history.

In the daily operation and management of aids to navigation, AtoN departments under CHINA MSA integrate the PDCA cycle—the foundational logic of the QMS—into all phases of operational activities. The operational framework is structured as follows:

1. **Top-Level Inputs (Plan)**

* User Requirements
* Needs of port authorities, shipping companies, mariners, and regional maritime economic development, etc.
* Legal, Regulatory, and Policy Basis
* SOLAS Convention, Maritime Traffic Safety Law of the People's Republic of China, Regulations on Aids to Navigation of the People's Republic of China, and administrative decrees from the Ministry of Transport, etc.
* Quality Policy and Objectives
* Core service objectives (e.g., effective navigation assistance, availability ≥99%).
* Defined quality commitments (safety, timeliness, reliability, accuracy, etc.).

1. **Process Execution (Do)**

* Resource Allocation
* Human Resources: Role assignment, personnel training (e.g., vocational certification for AtoN technicians, etc.).
* Technical Resources: Remote monitoring systems, BeiDou Positioning Technology, etc.
* Material Supply: Procurement of equipment, inventory management, fleet allocation, etc.
* Aids to Navigation Operations
* AtoNs layout design.
* Deployment and implementation.
* Routine inspection and maintenance.
* Fault response.
* Key Control Points
* Technical specifications of AtoNs (shape, color, light rhythm, range, etc.).

1. **Monitoring and Evaluation (Check)**

* Quality Control
* Internal/External Audits: Periodic reviews of the QMS.
* User Feedback: Satisfaction surveys.
* Technical Monitoring: Real-time operational data tracking, fault statistics, and analysis, etc.
* Performance Metrics
* Availability indicators (e.g., normal rate of AtoN, normal rate of AtoN maintenance).

1. **Improvement and Optimization (Act)**

* Corrective and Preventive Actions
* Root cause analysis (e.g., supply chain tracing for batch failures).
* Process optimization (e.g., integrating drone inspections to supplement manual checks).
* Management Review
* Annual review meetings to adjust quality objectives and resource allocation.
* Decisions on new technology adoption (e.g., 5G+ integration, multifunctional AtoNs).

1. **Outputs and Closed-Loop Feedback**

* Deliverables
* Continuous standardized navigation services (compliant with national mandatory standards).
* AtoNs deployment optimized for maritime traffic flow.
* Information Feedback Loop
* Integration of monitoring data and analysis results into management review inputs.

The operational logic framework of the aforementioned quality management system is further illustrated in the Annex through a workflow diagram.

# References

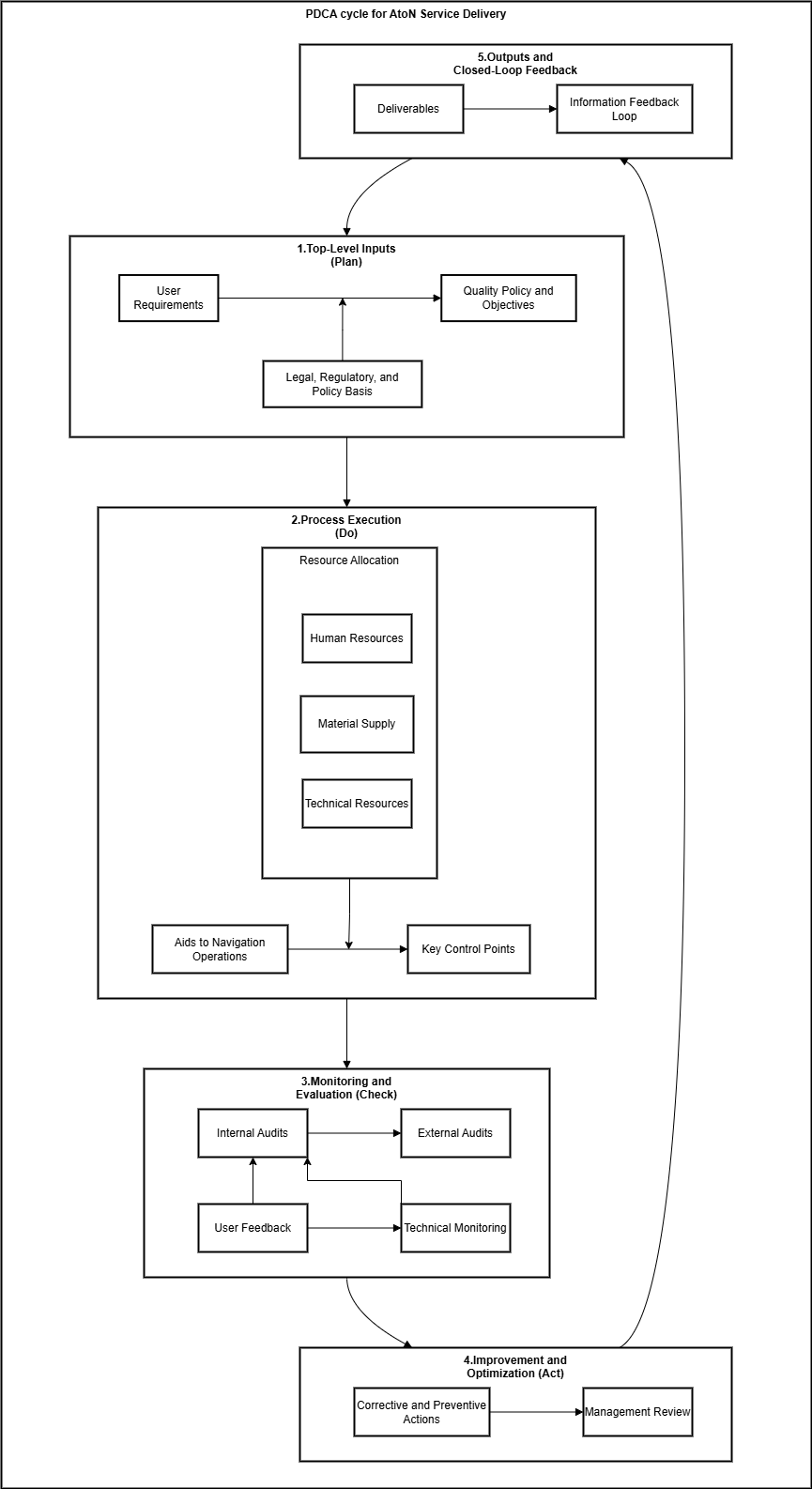
1. ISO 9001:2015 Quality management systems — Requirements.

# Action requested of the Committee

The Committee is requested to

1. Review and note the PDCA cycle operational framework contained in 3rd paragraph of section 3 ;
2. Consider incorporating the diagram contained in the Annex into the annex of draft G1052.

Annex PDCA cycle paractice for AtoN Management of CHINA MSA



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1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)