

# ISO 9001 THE MASU EXPERIENCE

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## ABSTRACT

The Mobile Aircraft Support Unit (MASU) based at H.M.S. *Daedalus*, Lee-on-the-Solent, was formed in 1990 by the amalgamation of two units belonging to the Directorate General Aircraft (Navy), namely the Mobile Aircraft Repair and Transport Salvage Unit and the Naval Aircraft Trials Installation Unit.

In the wake of the deliberations of the Joint Airworthiness Committee, set up to investigate the responsibilities for the airworthiness of military aircraft, MASU decided to review its quality assurance organization. This article describes the process by which it subsequently achieved the international quality standard of ISO 9001.

## Introduction

The Mobile Aircraft Support Unit (MASU), was accredited with the quality assurance status of ISO 9001 in 1993, quickly followed by Design Approved Organisation status. This article describes the experience. It may help other similar organizations decide whether this course of action is appropriate for them.

## Background

MASU based at H.M.S. *Daedalus*, Lee-on-the-Solent was formed in April 1990 by the amalgamation of 2 long standing service manned support units within the Fleet Air Arm (FAA), namely the Mobile Aircraft Repair Transport and Salvage Unit (MARTSU) and the Naval Aircraft Trials Installation Unit (NATIU). The new unit became an integral part of the Aircraft Support Executive (Navy) which reports to the Director General Aircraft (Navy) (DGA(N)). The principal tasks of the new unit are:

- (a) The worldwide on-site repair of major structural damage to the helicopters of the three UK Armed Services (FIG. 1).



FIG. 1—RAF PUMA REQUIRING ATTENTION FROM THE MASU REPAIR SECTION

- (b) The design, development and trial installation of Naval Service Modifications (NSM) to introduce new equipments into naval aircraft (FIG. 2).
- (c) The worldwide salvage and routine transport of the helicopters of the three UK Armed Services.
- (d) The provision of tool control outfits to the FAA.

With a mixed uniformed and civilian staff of 140, plus a sizeable transport fleet it has an annual cash budget of £4M.

Coincident with the formation of MASU, the issue of responsibility for the airworthiness of military aircraft was being discussed between the Services and MoD(PE) by the Joint Airworthiness Committee. As a direct result of the work of



FIG. 2—LEICA CAMERA FIT TO H.M.S. 'ENDURANCE' LYNX  
INSTALLED AS A NSM

this committee, the Officer-in-Charge MASU became formally accountable for the quality of airframe repairs (undertaken by MASU teams) to the helicopters of all three Services and for the production of NSMs. This prompted a profound review of MASU's quality assurance organization.

Before the amalgamation of MARTSU and NATIU, the maintenance of standards within the original organisations was monitored by the Naval Air Command's quality assurance system, which included the biennial Flag Officer's inspection. On transfer of administrative control to DGA(N) and the heightened emphasis of airworthiness accountability, it became imperative that a replacement quality system be identified and implemented. This would assure all MASU's customers that the quality of its output met the high standards required for safe aviation.

### **Identifying the quality system for MASU**

Since the publication of the Raby Report in 1969, the Defence Procurement Executive (MoD(PE)) has evaluated the technical competence of all potential suppliers before defence contracts are placed; only firms assessed and found to have satisfactory quality arrangements being invited to tender. The contractors then would be responsible for the quality of their products and supplies, so reducing the need for MoD inspectors to carry out acceptance inspections.

A series of Defence Standards were produced, based on the quality requirements specifications issued by the NATO Military Agency for Standardization (MAS). These specified the requirements for the various quality control inspection systems operated by potential contractors and suppliers. These were used until 1985, when it was decided to adopt the NATO specifications published as Allied Quality Assurance Publications (AQAP).

With the emergence of the ISO 9000 series of quality standards in 1987, it became clear to NATO that there would be merit in adopting this for use by all nations in their quality assurance activities; thereby creating a truly internationally recognized system. In 1990, the MoD adopted the ISO 9000/EN 29000/BS5750 series of quality standards, for use in the quality assessment and certification of suppliers.

The repair and NSM tasks of the MASU require considerable original design work. It was therefore appropriate that MASU should aim for accreditation in accordance with the provisions of ISO 9001. This being the standard for a quality system of a supplier undertaking design and development, in addition to production, installation and servicing. Achievement of ISO 9001 accreditation would logically lead to registration as a 'Design Approved Organization'.

### Preparations

It was appreciated that preparing for assessment would consume considerable time and resources. In September 1991 the project began in earnest with one lieutenant and two warrant officers providing the core effort and 2½ years later they were to see its completion.

There was an appreciation at the outset of the need specifically to address airworthiness issues. This meant the organization had primarily to satisfy the following:

- (a) The responsibility and authority of the people involved had to be clearly defined. In particular, individuals had to have the authority, competence, freedom of action and control of resources necessary, to take effective measures to ensure airworthiness standards were complied with.
- (b) A system of monitoring was needed to ensure the organization was working as intended. Ideally this was to be done by people not having responsibility for the aspects of the organization being monitored.
- (c) Periodically the organization was to be reviewed to ensure that it was responding to changes in requirements and was taking full advantage of any opportunities that arose to improve effectiveness and reduce waste.

Having established the basic requirements of the ISO 9001 system it was necessary to set the following enabling objectives:

- (a) Draft the MASU Quality Manual.
  - This would include the outline of the MASU organization, quality policy and management responsibilities for quality assurance. Conformance with total quality management principles and the overriding requirement to meet customers needs were central to this activity.
- (b) Survey current activities within the MASU in order to determine:
  - (1) The tasks undertaken by each worker.
  - (2) The degree of agreement between the tasks undertaken and current job descriptions/terms of reference.
  - (3) The qualifications and experience required for each task.
  - (4) The training required for each task and how this requirement was met.
  - (5) The degree of conformance with current orders and regulations.
- (c) Draft job descriptions for the posts shown in the MASU organization plan, taking into account the information gained from above.
- (d) Identify the qualifications and experience required for each position.
- (e) Identify the training requirements for each position.
- (f) Determine the scope of design activities and in particular define the authorized limits of such activities.

- (g) Ensure the following existing procedures met both service and ISO 9001/BS 5750 requirements, and identify any actions necessary to bring them up to that standard:
- Work recording.
  - Work instructions produced in the MASU.
  - The control of materials.
  - Practices for the calibration and control of test and measuring equipment, including jigs and locally produced fixtures.
- (h) Draft instructions for the review procedures to be adopted to ensure that the quality system responded to changes in customers requirements and the introduction of new processes and materials.
- (i) Draft instructions for the procedures to be implemented, following the discovery of work or materials which fail to meet the specified quality standards. Ensure that effective corrective action was taken.

Having achieved all the above objectives, the MASU Quality Manual was approved for use in December 1992. All routines, procedures and documentary requirements became mandatory on that date, allowing a period of consolidation before the formal ISO 9001 assessment.

### Assessment

Early in the project, it was decided to request advice and guidance from the Directorate of Quality Assurance (DQA) and arrange for that agency to carry out the assessment for ISO 9001 accreditation. A preliminary visit was made to the unit by a DQA representative in May 1992, after which a report was received providing invaluable advice on the future conduct of the project. This resulted in considerable review and amendment of the work already achieved. A copy of the final Quality Manual was forwarded to DQA in January 1993 to provide a standard against which the formal assessment was to be made.

The formal assessment was carried out in May 1993 by a team of four assessors:

- Two representing DQA, looked closely at how the unit operated against the supplied Quality Manual.
- A third member, seconded from the Assistant Directorate of Aircraft Design Approvals/Requirements and Procedures (AD/ADRP), reviewed the design function of the unit to ensure that procedures existed and were being observed that guaranteed that all stages of the design process were minuted, recorded and approved.
- A fourth member, representing Aircraft Technical Publications (ATP), addressed all aspects of the maintenance and control of the unit's holdings of aircraft maintenance manuals and servicing schedules.

A total of 38 non-conformances were identified, none of which required a suspension of operations. The unit was invited to nominate a date, within 3 months, by which all non-conformances were to be resolved. Two months later, in mid July, a re-assessment of the non-conforming areas was carried out to the satisfaction of the assessors. On 30 July 1993 MASU was accredited with the ISO 9001 status for the maximum period allowed of 3 years, after which re-assessment must be carried out.

To apply for Design Approved Organization status, it was necessary to prepare an exposition of the unit for submission to AD/ADRP. This drew heavily on the previously assessed Quality Manual but also had to include the name, training and experience of all key personnel with direct responsibility for design approval of aircraft repairs and NSMs. The exposition was formally submitted in December

1993 and on 23 February 1994 MASU was registered as a Design Approved organization.

### **Subsequent experience**

It was appreciated at the outset that success of the project relied upon the unstinting co-operation of the entire workforce. If it were not to be considered additional bureaucracy, they would need to feel part of its production. All staff were invited to contribute to the project and were made to feel that this was their quality system. Regular briefings and newsletters from the project team ensured that staff involvement and interest was maintained. The formal introduction of the system was greeted with minimal resistance and, after some 18 months of operating experience, is accepted as an integral and indispensable part of the unit's operations.

The achievement of ISO 9001 accreditation is considered a means to an end and not an end in itself. The MASU quality system is constantly evolving as a result of experience gained. Regular audits of all aspects of the repair and NSM tasks reveal shortcomings and ambiguities, which ultimately result in amendments to procedures and documentation. Quarterly management review meetings are held to ensure that the system continues to achieve the stated objectives.

### **Conclusion**

Undoubtedly the close self examination involved in the process of developing the MASU quality system has produced a more efficient unit, providing an improved service to customers. Furthermore, the system ensures the correct standards and practices whatever the frequency of changeover of staff and irrespective of their backgrounds and attitudes. Nonetheless, even though the benefits to be gained by organizations such as MASU are considerable and fully justify the effort involved, it is not an exercise to embark on lightly.

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