Considering Aircraft Base Maintenance – Production Planning, Material Planning, Technical Services & Quality Assurance

Sofema Aviation Services (SAS) www.sassofia.com looks at the various requirements to meet with “minimum” Base Maintenance Requirements both related to Regulatory Compliance and Organisational Best Practices within an EASA Part 145 Organisation.

Production Planning

General – Effective Interface with ART M Continuing Airworthiness Management Organisation (CAMO) and ideally to be able to influence the CAMO in a positive way.

Effectively bring together a number of disparate elements to obtain the best possible result in the minimum time whilst recognising the importance of Safety, Human Performance and Fatigue Risk Management Systems (FRMS)

The delivery of an effective Production Planning function sits firmly with the EASA Part 145 Organization.

- General oversight of the facilities
- General work preparation
- Responsive to environmental conditions
- Inventory control
- Subcontract Co-ordination
- Planning of safety critical tasks
- Managing hangar availability
- Man hours estimation
- Availability and the control of approved data.
- Reporting at the beginning and throughout the maintenance check should be considered as a requirement of the highest order.
- The importance of Managing Competencies is considered as well
- Implement an Effective Quality Control Process in Production Planning

Concerning Maintenance Manpower Planning

The maintenance man-hour plan should relate to the anticipated maintenance work load except that when the organisation cannot predict such workload, due to the

short term nature of its contracts, then such plan should be based upon the minimum maintenance workload needed for commercial viability.

Maintenance work load includes all necessary work such as, but not limited to, planning, maintenance record checks, production of worksheets/cards in paper or electronic form, accomplishment of maintenance, inspection and the completion of maintenance records.

In the case of aircraft base maintenance, the maintenance man-hour plan should relate to the aircraft hangar visit plan as specified in AMC 145.A.25(a).

Concerning Handover Procedure

Ensure the following three basic elements:

- The outgoing person's ability to understand and communicate the important elements of the job or task being passed over to the incoming person.
- The incoming person's ability to understand and assimilate the information being provided by the outgoing person
- A formalised process for exchanging information between outgoing and incoming persons and a planned shift overlap and a place for such exchanges to take place.

Concerning the Performance of Maintenance

145.A.48 Performance of maintenance (Regulation (EU) 2020/270)

The organisation shall establish procedures to ensure that:

- After completion of maintenance a general verification is carried out to ensure that the aircraft or component is clear of all tools, equipment and any extraneous parts or material, and that all access panels removed have been refitted – How is it managed?
- An error capturing method is implemented after the performance of any critical maintenance task.
- The risk of multiple errors during maintenance and the risk of errors being repeated in identical maintenance tasks are minimised; and,
- Damage is assessed and modifications and repairs are carried out using data specified in point M.A.304 of Annex I (Part-M)

Review of the following for Effectiveness

Manpower Control – The Manpower required to support the maintenance process is one of the most expensive commodities, with the aim to have sufficient manpower when required throughout the check is a major challenge.

A percentage of the work and parts replacement required during heavy maintenance cannot be directly planned as it is triggered by inspection findings. This results in additional manpower requirements which need to be accommodated and if possible, allowed for in advance.

Competence – Having Sufficient persons is only part of the story, the people we have must be effective and cable of delivering the work we require in an acceptable time frame. Therefore, the Management and control of Competence becomes a key feature in the delivery of an effective organisation.

Facilities – The available facilities need to meet all objectives in the best way and part of the production planning role is to match the available facilities / workload requirement and manpower.

Tooling – Tooling needs to be available at the point of delivery of the maintenance, short falls and shortages should be minimised, the tooling requirement is typically known or at the very least the information related to the tooling requirement requirements are known. Waiting for tooling results in lost time!

Equipment - As with tooling above all equipment needs to be available to both support the correct access requirements as well as to again minimise lost time.

Technical Documentation – Must cover all the elements of the work being performed or which require support documents to perform research or evaluation – for example standards manual.

Check Pack & Certification – The system of Certification should ensure that all tasks are clearly managed, stage signed and certified where appropriate by suitable authorised persons.

Time Constraints – We only have a limited period to perform the maintenance and therefore need to ensure that we provide the best possible service delivery.

The use of Critical Path Techniques can help us to manage the available resources in the best way.

Material Planning

The availability of all spares and materials is essential for the effectiveness of the maintenance delivery.

- Supplier Evaluation and Subcontract Control Procedure
- Approved Suppliers / Monitoring of Suppliers and subcontractors
- Type of documents (Certificates, audit reports, list of suppliers, incoming inspection results)

Technical Services

There are a number of areas where there is an overlap of responsibilities sitting between the Part M organization and the Part 145 Organization.

In the area of Mandatory Reporting to the Civil Aviation Authority “CAA” compliance with AMC 20-8 should be arranged so that there is in place a controlled procedure to provide guidance on how Mandatory reporting will be achieved.

In respect of the obligation to show compliance with the requirements of EASA Part M Subpart “D” the Operator is ultimately responsible for the provision of all Instructions for Continued Airworthiness “ICAW” This typically requires an annex to the contract to be in place which obliges the Operator to ensure the Maintainer has all necessary approved data to perform the required maintenance.

For its part the Part 145 organization has to take all necessary steps to ensure that the maintenance is performed and certified in accordance with current and applicable data.

In respect of the obligation to show compliance with the requirements of EASA Part M subpart “E” it is necessary to ensure the Part 145 organization has all necessary information concerning the aircraft Component status and configuration including AD compliance of any components which are to be replaced.

Typical Tech Service Duties in support of Production Planning

- Update of computerised maintenance systems to maintain a live aircraft maintenance status
- Review of Airworthiness Directives and Service Bulletins
- Monthly review of the organisations regulatory, airworthiness and maintenance data for currency
- Issue of work orders as required for maintenance to be carried out

- Maintenance documentation is reviewed and stored correctly with airplane/Engine Log Books updated accordingly
- Co-ordination with Production Planning / CAMO & BM Regarding Modification, Service Bulletin and Repair Requirements

Quality Assurance & QA Auditor – Review of the following:

Lead the Implementation and maintenance of the Quality Management System, Safety Management System and Integrated Management System within the AMO.

Co-ordinating action on airworthiness occurrences and safety related matters and for initiating any necessary further investigation and follow-up activity;

Develop and ensure implementation the AMO's Emergency Response Plan to cover aircraft incidents, occupational injuries, fires, spills, dangerous goods etc;

The Quality system is part of the activities of the part-145 organisation and therefore it should be monitored. Point 145.A.65 (c) requires that the quality system monitors that the activities are being performed in accordance with the approved procedures.

The quality system procedures are included within these approved procedures. This implies that quality system must be subject to audits and the part-145 organisation audit programme/plan needs to reflect this. Besides that the audits of the quality system shall satisfy the requirement of independent audits.

This is further explained in AMC 145.A.65(c)(1) point 11: the independence of the audits should be established by always ensuring that audits are carried out by personnel not responsible for the functions, procedures or products being checked. So, the quality manager cannot audit the quality system in terms of independence of the audit.

Procedures in place to manage the following:

- Internal safety and quality audits
- External audits from aviation authorities, customers and certification / accreditation bodies
- Liaise with aviation authorities / customer in the process of approval application, change and renewal
- To perform capability assessment
- To manage, lead, perform and report event investigation
- To evaluate suppliers' QMS and to perform supplier audit

- To provide support, advice, consultancy and training in safety and quality related matters to internal customers
- To perform authorisation assessment
- Safety and quality data collection, analysis, reporting and presentation in safety review meetings and reports
- Support AMO Training requirements and ensure all procedural and regulatory training requirements are met.

Next Steps

Sofema Aviation Services SAS (www.sassofia.com) and Sofema Online (SOL) (www.sofemaonline.com) provide Classroom, Webinar & Online Training Courses specifically focused on the needs of the Continuing Airworthiness Management Organisation (CAMO) and Aircraft Maintenance Organisation (AMO).

For details please see the websites or
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