



**THE NETHERLANDS MILITARY
AIRWORTHINESS REGULATIONS**

NLD-MAR-145

**AMC & GM FOR MAINTENANCE
ORGANISATIONS**

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NLD-MAR-145 AMC & GM FOR MAINTENANCE ORGANISATIONS

NOTES:

1. This NLD-MAR-145 AMC/GM document is a derivative from EMAR 145 AMC/GM, version 1.2, and is kept as close as possible to the original text. The Safety Management System based on ICAO Annex 19 is incorporated in this NLD-MAR-145 AMC/GM document.
2. Future amended paragraphs from this NLD-MAR-145 AMC/GM document will be indicated by using a 'sidebar' in the margin.
3. This NLD-MAR AMC/GM relies on definitions laid down in NLD-MAD-1. The Forms referred to in this document are published on MAA-NLD intranet and internet.
4. NLD-MAR-M introduces a number of constructs that are possible in the relationship between an Operating Organisation, CAMO and NLD-MAR-145 AMO. Within NLD-MAR-145, where the terminology 'Operating Organisation/CAMO' is used, it is essential that the appropriate organisation that can provide the required authority/service/information is engaged as per the context of the NLD-MAR-145 requirement.
5. Unless specified otherwise in the text, all references to 'maintenance organisation' within this document are to be understood to mean a maintenance organisation that already has an NLD-MAR-145 approval and a maintenance organisation that is seeking an NLD-MAR-145 approval. All references to 'AMO' within this document are to be understood to mean an 'Approved Maintenance Organisation' that already has an NLD-MAR-145 approval.
6. Maintenance organisations already holding a MAR-145 approval based on the MAR-145 are also considered Approved Maintenance Organisations.

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ACCEPTABLE MEANS OF COMPLIANCE & GUIDANCE MATERIAL

SECTION A

TECHNICAL REQUIREMENTS

AMC 145.A.10 Scope

1.
 - (a) *Line Maintenance* is defined in NLD-MAD-1.
 - (b) For temporary or occasional cases (Airworthiness Directives (ADs), Service Bulletins (SBs) or national equivalent) the Quality Manager may accept base maintenance tasks to be performed by a line maintenance organisation provided all requirements are fulfilled as defined by the MAA-NLD.
 - (c) *Base Maintenance* is defined in NLD-MAD-1.
 - (d) Aircraft maintained in accordance with 'progressive' type maintenance programmes should be individually assessed in relation to this paragraph. In principle, the decision to allow some 'progressive' checks to be carried out should be determined by the assessment that all tasks within the particular check can be carried out safely to the required standards at the designated line maintenance station.
2. NOT APPLICABLE.
3. Within the scope of this NLD-MAR, the meaning of the term 'military' may be extended to include all other State activities excluded by Regulation (EC) No 216/2008 (e.g. customs, police, search and rescue, firefighting, coastguard or similar activities or services) as determined by the MAA-NLD's pMS.
4. The following types are defined by the MAA-NLD as non-complex aircraft:
 - Puma AE DDL
 - Raven DDL
 - RQ-11B
 - WASP AE DDL
 - X-200
 - X-300

GM 145.A.10 Scope

NOT APPLICABLE

AMC 1 145.A.15 Application

In a form and manner established by the MAA-NLD means that the application should be made by using an NLD-MAR Form 2 (Appendix III to AMC 145.A.15).

AMC 2 145.A.15 Application

1. Each application for approval, or change in the scope of work of an existing approval or other changes that may affect the existing approval (e.g. location, facilities) shall be substantiated with a self-evaluation, focused to the scope of the application, by which the organisation:
 - a. determines through an on-desk assessment to what level the procedures in the Maintenance Organisation Exposition (MOE) are compliant with the applicable NLD-MAR-145 requirements;
 - b. determines through an on-site audit to what level the organisation is practically working in accordance with the processes and procedures as described in the MOE;
 - c. presents the results of both assessments in a Compliance-Checklist report, which gives per (sub)paragraph a clear overview* of the way the organisation is compliant to the requirements;
 - d. eliminates all existing Level-1 findings before applying for approval;
 - e. mitigates all existing Level-2 findings with an appropriate detailed action plan describing how and when the respective finding will be corrected within an appropriate timeframe (ref. NLD-MAR-145.A.65(c)).
2. Each application for a change of the existing approval shall be substantiated with the necessary changes to the MOE.
3. In the event that the application focusses on a reduction of the scope of an existing approval, substantiation by self-evaluation is not required. The application form shall specify explicitly how the existing scope is to be reduced.

AMC 145.A.20 Terms of approval

Table 1 in Appendix II of NLD-MAR-145 identifies the S1000D Chapter Reference for the Category C component rating. If the maintenance manual (or equivalent document) does not follow the S1000D Chapter reference, the corresponding subjects still apply to the applicable C rating.

* References to the respective MOE-paragraph may be sufficient.

AMC 145.A.25(a) Facility requirements

1. Where the hangar is not owned by the maintenance organisation, it may be necessary to establish proof of tenancy. In addition, sufficiency of hangar space to carry out planned base maintenance should be demonstrated by the preparation of a projected aircraft hangar visit plan relative to the maintenance programme. The aircraft hangar visit plan should be updated on a regular basis.
2. Protection from the weather elements relates to the normal prevailing local weather elements that are expected throughout any twelve-month period. Aircraft hangar and component workshop structures should prevent the ingress of rain, hail, ice, snow, wind and dust etc. as far as is militarily practicable. Aircraft hangar and component workshop floors should be sealed to minimise dust generation.
3. For line maintenance of aircraft, hangars are considered essential for usage for minor scheduled work during inclement weather, and lengthy defect rectification.
4. Aircraft maintenance staff should be provided with an area where they may study maintenance instructions and complete maintenance records in a proper manner.

AMC 145.A.25(b) Facility requirements

It is acceptable to combine any or all of the office accommodation requirements into one office subject to the staff having sufficient room to carry out the assigned tasks.

In addition, as part of the office accommodation, aircraft maintenance staff should be provided with an area where they may study maintenance instructions and complete maintenance records in a proper manner.

AMC 145.A.25(c) Facility requirements

Military operational needs should be taken into account when establishing a suitable working environment. However, as far as is practicable, the requirements should be adhered to.

AMC 145.A.25(d) Facility requirements

1. Storage facilities for serviceable aircraft components should be clean, well ventilated and maintained at a constant dry temperature to minimise the effects of condensation. Manufacturer's storage recommendations should be followed for those aircraft components identified in such published recommendations. With regards to deployed military operations these requirements should be met as far as practicable.
2. Storage racks should be strong enough to hold aircraft components and provide sufficient support for large aircraft components such that the component is not distorted during storage.
3. All aircraft components, wherever practicable, should remain packaged in protective material to minimise damage and corrosion during storage.

AMC 145.A.30(a) Personnel requirements

With regard to the Accountable Manager, it is normally intended to mean the Chief Executive Officer or senior military commander of the maintenance organisation, who by virtue of position has overall (including in particular resource allocation) responsibility for running the maintenance organisation. The Accountable Manager may be the Accountable Manager for more than one organisation and is not required to be necessarily knowledgeable on technical matters as the MOE defines the maintenance standards. When the Accountable Manager is not the Chief Executive Officer or senior military commander, the MAA-NLD will need to be assured that such an Accountable Manager has direct access to the Chief Executive Officer or senior military commander and has a sufficiency of 'maintenance resources' allocation.

AMC 145.A.30(b) Personnel requirements

1. Dependent upon the size of the maintenance organisation, the NLD-MAR-145 functions may be subdivided under individual managers or combined in any number of ways.
2. The maintenance organisation should have, dependent upon the extent of approval, a base maintenance manager, a line maintenance manager, a workshop manager, a quality manager and a safety manager, all of whom should report to the Accountable Manager.
3. The base maintenance manager is responsible for ensuring that all required base maintenance, plus any defect rectification carried out during base maintenance, is carried out to the design and quality standards specified in NLD-MAR-145.A.65(b). The base maintenance manager is also responsible for any corrective action resulting from the quality compliance monitoring of NLD-MAR-145.A.65(c).
4. The line maintenance manager is responsible for ensuring that all line maintenance required to be carried out including line defect rectification is carried out to the standards specified in NLD-MAR-145.A.65(b) and also responsible for any corrective action resulting from the quality compliance monitoring of NLD-MAR-145.A.65(c).
5. The workshop manager is responsible for ensuring that all work on aircraft components is carried out to the standards specified in NLD-MAR-145.A.65(b) and also responsible for any corrective action resulting from the quality compliance monitoring of NLD-MAR-145.A.65(c).
6. The quality manager's responsibility is specified in NLD-MAR-145.A.30(c).
7. The safety manager is responsible for the development, administration and maintenance of effective Safety Management System in accordance with NLD-MAR-145.A.67.
8. Notwithstanding the example subparagraphs 2 – 7 titles, the maintenance organisation may adopt any title for the foregoing managerial positions but should identify to the MAA-NLD the titles and persons chosen to carry out these functions.

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9. Where a maintenance organisation chooses to appoint managers for all or any combination of the identified NLD-MAR-145 functions because of the size of the undertaking, it is necessary that these managers' report ultimately through either the base maintenance manager or line maintenance manager or workshop manager or quality manager or safety manager, as appropriate, to the Accountable Manager.

Note: Certifying staff may report to any of the managers specified depending upon which type of control the maintenance organisation uses (for example licensed engineers/independent inspection/dual function supervisors etc.) as long as the quality compliance monitoring staff specified in NLD-MAR-145.A.65(c)(1) remain independent.

AMC 145.A.30(c) Personnel requirements

Monitoring the quality system includes requesting remedial action as necessary by the Accountable Manager and the nominated persons referred to in NLD-MAR-145.A.30(b).

AMC 145.A.30(d) Personnel requirements

1. 'Sufficient' means that the maintenance organisation employs or contracts/tasks competent staff, as detailed in the man-hour plan, of which at least half the staff that perform maintenance in each workshop, hangar or flight line on any shift should be employed to ensure organisational stability. For the purpose of meeting a specific operational necessity, a temporary increase of the proportion of contracted staff may be permitted to the maintenance organisation by the MAA-NLD, in accordance with an approved procedure which should describe the extent, specific duties, and responsibilities for ensuring adequate organisation stability. For the purpose of this subparagraph, employed means the person is directly employed as an individual by the maintenance organisation whereas contracted/tasked means the person is employed by another organisation or military unit and contracted/tasked by that organisation to the maintenance organisation. In the case of MOD/Industrial partnered support arrangements, the MOD element of the maintenance organisation should be considered, for the purpose of this clause, as part of the industry workforce.

2. The maintenance man-hour plan should take into account all activities carried out outside the scope of the NLD-MAR-145 approval.

The planned absence (for training, vacations, etc.) should be considered when developing the man-hour plan.

3. The maintenance man-hour plan should relate to the anticipated maintenance work load except that when the maintenance organisation cannot predict such workload, due to the short-term nature of its contracts/tasking or unpredictable variations in operational military tasking, then such a plan should be based upon the minimum maintenance workload needed for organisational 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.

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

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5. In the case of aircraft component maintenance, the maintenance man-hour plan should relate to the aircraft component planned maintenance as specified in NLD-MAR-145.A.25(a)(2).
6. The quality monitoring compliance function man-hours should be sufficient to meet the requirement of NLD-MAR-145.A.65(c) which means taking into account AMC NLD-MAR-145.A.65(c). Where quality monitoring staff perform other functions, the time allocated to such functions needs to be taken into account in determining quality monitoring staff numbers.
7. The safety managers function man-hours should be sufficient to meet the requirement of NLD-MAR-145.A.67 which means taking into account AMC NLD-MAR-145.A.67. Where safety managers staff perform other functions, the time allocated to such functions needs to be taken into account in determining safety managers staff numbers.
8. The maintenance man-hour plan should be reviewed at least every 3 months and updated when necessary.
9. Significant deviation from the maintenance man-hour plan should be reported through the appropriate manager to the quality manager and the Accountable Manager for review. Significant deviation means more than a 25% shortfall in available man-hours during a calendar month for any one of the functions specified in NLD-MAR-145.A.30(d), or an inability to achieve military tasking due to personnel shortfalls.

AMC 1 145.A.30(e) Personnel requirements

Competence should be defined as a measurable skill or standard of performance, knowledge and understanding, taking into consideration attitude and behaviour.

The referenced procedure requires amongst others that planners, mechanics, specialised services staff, supervisors, certifying staff and support staff, whether employed or contracted, are assessed for competence before unsupervised work commences and competence is controlled on a continuous basis.

Competence should be assessed by evaluation of:

- on-the-job performance and/or testing of knowledge by appropriately qualified personnel; and
- records for basic, organisational, and/or product type and differences training; and
- experience records.

Validation of the above could include a confirmation check with the organisation(s) that issued such document(s). For that purpose, experience/training may be recorded in a document such as a log book or based on the suggested template in GM 3 to NLD-MAR-145.A.30(e).

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As a result of this assessment, an individual's qualification should determine:

- which level of ongoing supervision would be required or whether unsupervised work could be permitted.
- whether there is a need for additional training.

A record of the qualification and competence assessment should be kept.

This should include copies of all documents that attest to qualification, such as the MAML and/or any authorisation held, as applicable.

For a proper competence assessment of its personnel, the maintenance organisation should consider that:

1. In accordance with the job function, adequate initial and recurrent training should be provided and recorded to ensure continued competence so that it is maintained throughout the duration of employment/contract.
2. All staff should be able to demonstrate knowledge of and compliance with the maintenance organisation's procedures, as applicable to their duties.
3. All staff should be able to demonstrate an understanding of safety management principles, human factors and human performance issues in relation with their job function and be trained as per AMC 2 to NLD-MAR-145.A.30(e).
4. To assist in the assessment of competence and to establish the training needs analysis, job descriptions are recommended for each job function in the maintenance organisation. Job descriptions should contain sufficient criteria to enable the required competence assessment.
5. Criteria should allow the assessment to establish that, among others (titles might be different in each organisation):
 - Managers are able to properly manage the work output, processes, resources and priorities described in their assigned duties and responsibilities in a safe compliant manner in accordance with requirements and maintenance organisation procedures.
 - Planners are able to interpret maintenance requirements into maintenance tasks, and have an understanding that they have no authority to deviate from the maintenance data.
 - Supervisors are able to ensure that all required maintenance tasks are carried out and, where not completed or where it is evident that a particular maintenance task cannot be carried out to the approved maintenance data, then such problems should be reported to the NLD-MAR-145.A.30(c) person for appropriate action. In addition, for those supervisors, who also carry out maintenance tasks, that they understand such tasks should not be undertaken when incompatible with their management responsibilities.

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- Mechanics are able to carry out maintenance tasks to any standard specified in the maintenance data and should notify supervisors of defects or mistakes requiring rectification to re-establish required maintenance standards.
- Specialised services staff are able to carry out specialised maintenance tasks to the standard specified in the maintenance data. They should be able to communicate with supervisors and report accurately when necessary.
- Support staff are able to determine that relevant maintenance tasks have been carried out to the required standard.
- Certifying staff are able to determine when the maintenance performed on the aircraft or aircraft component is ready to release to service and when it should not be released to service.
- Quality audit staff are able to monitor compliance with NLD-MAR-145 identifying non-compliance in an effective and timely manner so that the Approved Maintenance Organisation (AMO) may remain in compliance with NLD-MAR-145.
- Staff having designated safety management responsibilities are familiar with the relevant processes in terms of hazard identification, risk management, and monitoring of safety performance.
- All staff are familiar with the safety policy and the procedures and tools that can be used for internal safety reporting.

Competence assessment should be based upon the procedure specified in GM 2 to NLD-MAR-145.A.30(e).

AMC 2 145.A.30(e) Personnel requirements

With respect to the understanding of the application of human factors and human performance issues, all maintenance organisation personnel should have received an initial and continuation human factors training. This should concern to a minimum:

- Nominated persons, managers, supervisors;
- Certifying staff, support staff and mechanics;
- Technical support personnel such as planners, engineers, technical record staff;
- Quality and safety management staff;
- Specialised services staff;
- Human factors staff/ human factors trainers;
- Logistics and purchasing department staff;

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- Ground equipment operators;
- Contracted/tasked staff in the above categories.

1. Initial human factors training should cover all the topics of the training syllabus specified in GM NLD-MAR-145.A.30(e) either as a dedicated course or else integrated within other training. The syllabus may be adjusted to reflect the particular nature of the maintenance organisation. The syllabus may also be adjusted to meet the particular nature of work for each function within the maintenance organisation. For example:

- small maintenance organisations not working in shifts may cover in less depth subjects related to teamwork and communication;
- planners may cover in more depth the scheduling and planning objective of the syllabus and in less depth the objective of developing skills for shift working.

All personnel, including personnel being recruited from any other organisation should receive initial human factors training compliant with the maintenance organisation's training standards prior to commencing actual job function, unless their competence assessment justifies that there is no need for such training. Newly directly employed personnel working under direct supervision may receive training within 6 months after joining the maintenance organisation.

2. The purpose of human factors continuation training is primarily to ensure that staff remain current in terms of human factors and also to collect feedback on human factors issues. Consideration should be given to the possibility that such training has the involvement of the quality manager and safety manager. There should be a procedure to ensure that feedback is formally passed from the trainers to the quality manager and safety manager to initiate action where necessary.

Human factors continuation training should be of an appropriate duration in each two-year period in relation to relevant quality audit findings and other internal/external sources of information on human errors in maintenance available to the maintenance organisation.

3. Human factors training may be conducted by the maintenance organisation itself, or independent trainers, or any training organisations acceptable to the MAA-NLD.

4. The human factors training procedures should be specified in the MOE.

AMC 3 145.A.30(e) Personnel requirements

Additional training in fuel tank safety as well as associated inspection standards and maintenance procedures should be required for maintenance organisations' technical personnel, especially technical personnel involved in the compliance of Critical Design Configuration Control Limitations (CDCCL) tasks (if applicable).

Guidance is provided for training to maintenance organisation personnel in Appendix IV to AMC 145.A.30(e) and AMC 145.B.10(c).

AMC 4 145.A.30(e) Personnel requirements

Competence assessment should include the verification for the need of additional Electrical Wiring Interconnection System (EWIS) training when relevant.

(Note: EASA guidance for an EWIS training programme to maintenance organisation personnel can be found in EASA AMC 20-22.)

GM 1 145.A.30(e) Personnel requirements (Training syllabus for initial human factors training)

The training syllabus below identifies the topics and subtopics to be addressed during the human factors training.

The maintenance organisation may combine, divide, change the order of any subject of the syllabus to suit its own needs, as long as all subjects are covered to a level of detail appropriate to the maintenance organisation and its personnel.

Some of the topics may be covered in separate training (health and safety, management, supervisory skills, etc.) in which case duplication of training is not necessary.

Where possible, practical illustrations and examples should be used, especially accident and incident reports.

Topics should be related to existing legislation, where relevant. Topics should be related to existing guidance/advisory material, where relevant (e.g. ICAO Human Factors (HF) Digests and Training Manual and appropriate military training).

Topics should be related to maintenance engineering where possible; too much unrelated theory should be avoided.

1. General/Introduction to human factors

1.1 The need to take human factors into account;

1.2 Statistics;

1.3 Incidents attributable to human factors/human error;

1.4 "Murphy's Law".

2. Safety Culture/Organisational factors

2.1 Just culture

2.2 Reporting culture

2.3 Informed culture

2.4 Flexible culture

2.5 Safety Risk Management

3. Human errors

3.1 Error models and theories;

3.2 Types of errors in maintenance tasks;

3.3 Violations;

3.4 Implications of errors (i.e. accidents);

3.5 Avoiding and managing errors;

3.6 Human reliability.

4. Human performance & limitations

4.1 Vision;

4.2 Hearing;

4.3 Information-processing;

4.4 Attention and perception;

4.5 Situational awareness;

4.6 Memory;

4.7 Claustrophobia and physical access;

4.8 Motivation and de-motivation;

4.9 Fitness/Health;

4.10 Stress: domestic and work related;

4.11 Workload management (overload and underload);

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- 4.12 Sleep and fatigue;
- 4.13 Alcohol, medication, drug abuse;
- 4.14 Physical work;
- 4.15 Repetitive tasks/complacency.

5. Environment

- 5.1 Peer pressure;
- 5.2 Stressors;
- 5.3 Time pressure and deadlines;
- 5.4 Workload;
- 5.5 Shift Work;
- 5.6 Noise and fumes;
- 5.7 Illumination;
- 5.8 Climate and temperature;
- 5.9 Motion and vibration;
- 5.10 Complex systems;
- 5.11 Hazards in the workplace, recognising and avoiding hazards, dealing with emergencies;
- 5.12 Lack of manpower;
- 5.13 Distractions and interruptions;
- 5.14 Military environment and other military factors/Operational pressures.

6. Procedures, information, tools and practices

- 6.1 Visual Inspection;
- 6.2 Work logging and recording;
- 6.3 Procedure — practice/mismatch/norms;
- 6.4 Technical documentation — access and quality.

7. Communication

- 7.1 Shift/Task handover;
- 7.2 Dissemination of information;
- 7.3 Cultural differences;
- 7.4 Within and between teams.

8. Teamwork

- 8.1 Responsibility: individual and group;
- 8.2 Management, supervision and leadership;
- 8.3 Decision making.

9. Professionalism and integrity

- 9.1 Keeping up to date; currency;
- 9.2 Error provoking behaviour;
- 9.3 Assertiveness.

10. Maintenance organisation's HF program

- 10.1 Safety risk assessment;
- 10.2 Confidential internal reporting scheme
- 10.3 Reporting errors and hazards;
- 10.4 Safety policy as related to non-punitive reporting and just culture;
- 10.5 Occurrence investigation process;
- 10.6 Action to address problems;
- 10.7 Feedback.

GM 2 145.A.30(e) – Competence assessment procedure

The maintenance organisation should develop a procedure describing the process of competence assessment of personnel. The procedure should specify:

- persons responsible for this process,
- when the assessment should take place,
- credits from previous assessments,
- validation of qualification records,
- means and methods for the initial assessment,
- means and methods for the continuous control of competence including feedback on personnel performance,
- competences to be observed during the assessment in relation with each job function,
- actions to be taken when assessment is not satisfactory,
- recording of assessment results.

For example, according to the job functions and the scope, size and complexity of the maintenance organisation, the assessment may consider the following (the table is not exhaustive):

| | Managers | Planners | Supervisor | Certifying staff and support staff | Mechanics | Specialised Service staff | Quality audit staff | Safety manager |
|--|----------|----------|------------|------------------------------------|-----------|---------------------------|---------------------|----------------|
| Knowledge of applicable officially recognised standards | | | | | | X | X | X |
| Knowledge of auditing techniques: planning, conducting and reporting | | | | | | | X | X |
| Knowledge of human factors, human performance and limitations | X | X | X | X | X | X | X | X |
| Knowledge of logistics processes | X | X | X | | | | | |
| Knowledge of maintenance organisation capabilities, privileges and limitations | X | X | X | X | | X | X | X |
| Knowledge of NLD-MAR-M, NLD-MAR-145 and any other relevant regulations | X | X | X | X | | | X | X |

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| | Managers | Planners | Supervisor | Certifying staff and support staff | Mechanics | Specialised Service staff | Quality audit staff | Safety manager |
|--|----------|----------|------------|------------------------------------|-----------|---------------------------|---------------------|----------------|
| Knowledge of relevant parts of the MOE and procedures | X | X | X | X | X | X | X | X |
| Knowledge of occurrence reporting systems and understanding of the importance of reporting occurrences, incorrect maintenance data and existing or potential defects | | X | X | X | X | X | X | X |
| Knowledge of safety risks linked to the working environment | X | X | X | X | X | X | X | X |
| Knowledge of Safety Management Systems and Just Culture | X | X | X | X | X | X | X | X |
| Knowledge on CDCCL when relevant | X | X | X | X | X | X | X | |
| Knowledge on EWIS when relevant | X | X | X | X | X | X | X | |
| Understanding of professional integrity, behaviour and attitude towards safety | X | X | X | X | X | X | X | X |
| Understanding of conditions for ensuring continuing airworthiness of aircraft and components | | | | X | | | X | |
| Understanding of his/her own human performance and limitations | X | X | X | X | X | X | X | |
| Understanding of personnel authorisations and limitations | X | X | X | X | X | X | X | |
| Understanding critical task | | X | X | X | X | | X | X |
| Ability to compile and control completed work cards | | X | X | X | | | | |
| Ability to consider human performance and limitations. | X | X | X | X | | | X | X |
| Ability to determine required qualifications for task performance | | X | X | X | | | | |
| Ability to identify and rectify existing and potential unsafe conditions | | | X | X | X | X | X | X |
| Ability to manage third parties involved in maintenance activity | | X | X | | | | | |

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| | Managers | Planners | Supervisor | Certifying staff and support staff | Mechanics | Specialised Service staff | Quality audit staff | Safety manager |
|---|----------|----------|------------|------------------------------------|-----------|---------------------------|---------------------|----------------|
| Ability to confirm proper accomplishment of maintenance tasks | | | X | X | X | X | | |
| Ability to identify and properly plan performance of critical task | | X | X | X | | | | |
| Ability to prioritise tasks and report discrepancies | | X | X | X | X | | | |
| Ability to process the work requested by the operator | | X | X | X | | | | |
| Ability to promote the safety and quality policy | X | | X | | | | X | X |
| Ability to properly process removed, uninstalled and rejected parts | | | X | X | X | X | | |
| Ability to properly record and sign for work accomplished | | | X | X | X | X | | |
| Ability to recognise the acceptability of parts to be installed prior to fitment | | | | X | X | | | |
| Ability to split complex maintenance tasks into clear stages | | X | | | | | | |
| Ability to understand work orders, work cards and refer to and use applicable maintenance data | | X | X | X | X | X | X | |
| Ability to use information systems | X | X | X | X | X | X | X | X |
| Ability to use, control and be familiar with required tooling and/or equipment | | | X | X | X | X | | |
| Adequate communication and literacy skills | X | X | X | X | X | X | X | X |
| Analytical and proven auditing skills (for example, objectivity, fairness, open-mindedness, determination, ...) | | | | | | | X | X |
| Maintenance error investigation skills | | | | | | | X | X |
| Resources management and production planning skills | X | X | X | | | | | |
| Teamwork, decision-making and leadership skills | X | | X | | | | X | X |
| Ability to encourage a positive safety culture and apply a just culture | X | | X | | | | X | X |

GM 3 145.A.30(e) – Template for recording experience/training

The following template may be used to record the professional experience gained in a maintenance organisation and the training received and be considered during the competence assessment of the individual in another maintenance organisation.

| | | |
|---|---|--|
| Aviation Maintenance personnel experience credential | | |
| Name | | Given name |
| Address | | |
| Telephone | | E-mail |
| Independent worker <input type="checkbox"/> | | |
| Trade Group: airframe <input type="checkbox"/> engine <input type="checkbox"/> electric <input type="checkbox"/> avionics <input type="checkbox"/> other (specify) <input type="checkbox"/> | | |
| Employer's details (when applicable) | | |
| Name | | |
| Address | | |
| Telephone | | |
| Maintenance organisation details | | |
| Name | | |
| Address | | |
| Telephone | | |
| Approval Number | | |
| Period of employment From: | | To: |
| Domain of employment | | |
| <input type="checkbox"/> Planning | <input type="checkbox"/> Engineering | <input type="checkbox"/> Technical records |
| <input type="checkbox"/> Logistics department | <input type="checkbox"/> Purchasing | |
| Mechanics/Technician | | |
| <input type="checkbox"/> Line Maintenance | <input type="checkbox"/> Base Maintenance | <input type="checkbox"/> Component Maintenance |
| <input type="checkbox"/> Servicing | <input type="checkbox"/> Removal/Installation | <input type="checkbox"/> Testing/inspection |
| <input type="checkbox"/> Scheduled Maintenance | <input type="checkbox"/> Inspection | <input type="checkbox"/> Repair |
| <input type="checkbox"/> Trouble-shooting | <input type="checkbox"/> Trouble-shooting | <input type="checkbox"/> Overhaul |
| | <input type="checkbox"/> Repair | <input type="checkbox"/> Re-treatment |
| | | <input type="checkbox"/> Reassembly |
| A/C type | A/C type | Component type |

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| | |
|--|---|
| Certifying Staff and support staff <input type="checkbox"/> Cat. A <input type="checkbox"/> Cat. B1 <input type="checkbox"/> Cat. B2 <input type="checkbox"/> Cat. C <input type="checkbox"/> Component Type <input type="checkbox"/> Other (e.g. NDT) A/C Type A/C Type A/C Type A/C Type Component Type Specify | |
| Certification Privileges: Yes <input type="checkbox"/> / No <input type="checkbox"/> | |
| <input type="checkbox"/> Specialised Services | Speciality (<i>NDT, composites, welding, etc.</i>): |
| <input type="checkbox"/> Skilled personnel | Speciality (<i>sheet metal, structures, wireman, upholstery, etc.</i>): |
| <input type="checkbox"/> Ground equipment operation | |
| <input type="checkbox"/> Quality control | <input type="checkbox"/> Quality assurance |
| <input type="checkbox"/> Training | |
| Total number of check boxes ticked: | |
| Details of employment | |
| Training received from the contracting organisation | |
| Date | Nature of training |
| Certified by: | |
| Name: | Date: |
| Position: | Signature: |
| Contact details: | |
| <p><i>Advisory note: A copy of the present credential should be kept for at least 3 years from its issuance by the maintenance organisation.</i></p> | |

AMC 145.A.30(f) Personnel requirements

1. NOT APPLICABLE.
2. Appropriately qualified means to levels of qualification and certification as defined by the European Standard EN 4179 (or national equivalent qualification) dependent upon the non-destructive testing function to be carried out.
3. Notwithstanding the fact that Level 3 personnel (or national equivalent qualification) may be qualified via EN 4179 to establish and authorise methods, techniques, etc., this does not permit such personnel to deviate from methods and techniques published by the (Military) Type Certificate Holder/manufacturer or MAA-NLD in the form of continued airworthiness data, such as in non-destructive test manuals or Service Bulletins, unless the manual or Service Bulletin expressly permits such deviation.
4. Notwithstanding the general references in EN 4179 to a national aerospace non-destructive testing (NDT) board, all examinations should be conducted by personnel or organisations under the general control of such a board or as specified by the MAA-NLD. In the absence of a national aerospace NDT board, the aerospace NDT board of another pMS should be used, as defined by the MAA-NLD.
5. Moved to GM 145.A.30(f) Personnel requirements.
6. It should be noted that new methods are being and will be developed, which are not specifically addressed by EN 4179. Until the time this agreed standard is established, such methods should be carried out in accordance with the particular equipment manufacturer's recommendations including any training and examination process to ensure competence of the personnel in the process.
7. Any maintenance organisation that carries out NDT should establish NDT specialist qualification procedures detailed in the MOE and accepted by the MAA-NLD.
8. Boroscopy and other techniques such as manual tap testing are non-destructive inspections rather than non-destructive testing. Notwithstanding such differentiation, the maintenance organisation should establish an MOE procedure accepted by the MAA-NLD to ensure that personnel who carry out and interpret such inspections are properly trained and assessed for their competence in the process. Non-destructive inspections, not being considered as NDT by NLD-MAR-145 are not listed in NLD-MAR-145 Appendix II under class rating D1.
9. The referenced standards, methods, training and procedures should be specified in the MOE.
10. Any such personnel who intend to carry out and/or control a non-destructive test for which they were not qualified prior to the effective date of NLD-MAR-145 should qualify for such non-destructive test in accordance with EN 4179 (or national equivalent qualification).

11. In this context officially recognised standard means those standards established or published by an official body whether having legal personality or not, which are widely recognised by the aerospace sector as constituting good practice, or those accepted by the MAA-NLD.

GM 145.A.30(f) Personnel requirements

Particular non-destructive test means any one or more of the following; Penetrant Testing (PT), Magnetic Testing (MT), Eddy current Testing (ET), Ultrasonic Testing (UT), Radiographic Testing (RT), Thermographic Testing (TT) and Shearographic Testing (ST) methods.

AMC 145.A.30(g)(1) Personnel requirements

1. For the purposes of NLD-MAR-66.A.20(a)(1) and NLD-MAR-66.A.20(a)(3)(ii) personnel, minor scheduled line maintenance means any minor scheduled inspection/check up to and including a weekly check specified in the Aircraft Maintenance Programme (AMP). For AMPs that do not specify a weekly check, the MAA-NLD should determine the most significant check that is considered equivalent to a weekly check.

2. Typical tasks permitted after appropriate task training to be carried out by the NLD-MAR-66.A.20(a)(1) and the NLD-MAR-66.A.20(a)(3)(ii) personnel for the purpose of these personnel issuing an aircraft Certificate of Release to Service (CRS) as specified in NLD-MAR-145.A.50 as part of minor scheduled line maintenance or simple defect rectification are contained in the following list:

- a. Replacement of wheel assemblies.
- b. Replacement of wheel brake units.
- c. Replacement of emergency equipment.
- d. Replacement of ovens, boilers and beverage makers.
- e. Replacement of internal and external lights, filaments and flash tubes.
- f. Replacement of windscreen wiper blades.
- g. Replacement of passenger and cabin crew seats, seat belts and harnesses.
- h. Closing of cowlings and refitting of quick access inspection panels.
- i. Replacement of toilet system components but excluding gate valves.
- j. Simple repairs and replacement of internal compartment doors and placards but excluding doors forming part of a pressure structure.
- k. Simple repairs and replacement of overhead storage compartment doors and cabin furnishing items.
- l. Replacement of static wicks.

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- m. Replacement of aircraft main and APU aircraft batteries.
- n. Replacement of inflight entertainment system components other than public address.
- o. Routine lubrication and replenishment of all system fluids and gases.
- p. The de-activation only of subsystems and aircraft components as permitted by the Operating Organisation's Minimum Equipment List (MEL) where relevant or national equivalent procedure, where such de-activation is agreed by the MAA-NLD as a simple task.
- q. Inspection for and removal of de-icing/anti-icing fluid residues, including removal/closure of panels, cowls or covers or the use of special tools.
- r. Removal and installation of simple internal medical equipment.
- s. Any other task agreed by the MAA-NLD as a simple task for a particular aircraft type. This may include defect deferment when all the following conditions are met:
 - There is no need for troubleshooting; and
 - The task is in the MEL; and
 - The maintenance action required by the MEL is agreed by the MAA-NLD to be simple.

In the particular case of helicopters, and in addition to the items above, the following:

- t. Removal and installation of external cargo provisions (i.e. external hook, mirrors) other than the hoist.
- u. Removal and installation of quick release external cameras and search lights.
- v. Removal and installation of emergency float bags, not including the bottles.
- w. Removal and installation of external doors fitted with quick release attachments.
- x. Removal and installation of snow pads/skid wear shoes/slump protection pads.

Any task on a military specific system agreed by the MAA-NLD as a simple task for a particular aircraft type.

No task which requires troubleshooting should be part of the authorised maintenance actions. Release to service after rectification of deferred defects should be permitted as long as the task is listed above.

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3. The requirement of having appropriate aircraft rated certifying staff qualified as Category B1 or B2 as appropriate, in the case of aircraft line maintenance does not imply that the maintenance organisation must have B1 or B2 personnel at every line station. The MOE should have a procedure on how to deal with defects requiring B1 or B2 certifying staff.

4. The MAA-NLD may accept that in the case of aircraft line maintenance a maintenance organisation has only B1 or B2 certifying staff, as appropriate, provided that the MAA-NLD is satisfied that the scope of work, as defined in the MOE, does not need the availability of all B1 or B2 certifying staff. Special attention should be taken to clearly limit the scope of scheduled and non-scheduled line maintenance (defect rectification) to only those tasks that can be certified by the available certifying staff Category.

AMC 145.A.30(g)(2) Personnel requirements

To be able to demonstrate to the MAA-NLD the acceptability of the training of the certifying staff at least the following subjects should be addressed by the AMO/MTO:

- The fact that the AMO/MTO has taken into account personnel requirements (records of instructors, examiners and assessors), facility requirements, training material and instructional equipment.
- Records of students.
- Quality and safety system (can be an integrated part of the system of the AMO).
- Basic training course (taken into account the basic principles of the NLD-MAR-66, depth and extent should be in proportion to the complexity of the system).
- Type training (taken into account the basic principles of the NLD-MAR-66, depth and extent should be in proportion to the complexity of the system).
- On the Job Training (for the first type training).
- Examinations (theoretical and practical).

The procedure to determine the qualifications of the certifying staff should be similar to AMC/GM 145.A.30(e) taken into account the complexity of the tasks and responsibilities to be granted to the certifying staff.

AMC 145.A.30(h) Personnel requirements

In accordance with NLD-MAR-145.A.30(h) and NLD-MAR-145.A.35, the qualification requirements (MAML, Military Aircraft Type Ratings, recent experience and continuation training) are identical for certifying staff and for support staff. The only difference is that support staff cannot hold certification privileges when performing this role since during base maintenance the release to service will be issued by Category C certifying staff. Nevertheless, the maintenance organisation may use as support staff (for base maintenance) persons who already hold certification privileges for line maintenance.

AMC 145.A.30(j)(4) Personnel requirements

1. For the issue of a limited certification authorisation the aircraft commander or flight engineer should hold either a valid pilot or flight engineer licence/national military qualification (or civilian equivalent) acceptable to the MAA-NLD on the aircraft type. In addition, the limited certification authorisation is subject to the MOE containing procedures to address the personnel requirements of NLD-MAR-145.A.30(e) and associated AMC and GM. Such procedures should include as a minimum:

- a. Completion of adequate national military airworthiness regulations training; and
- b. Completion of adequate task training for the specific task on the aircraft. The task training should be of sufficient duration to ensure that the individual has a thorough understanding of the task to be completed and should involve training in the use of associated maintenance data; and
- c. Completion of the procedural training as specified in NLD-MAR-145.

The above procedures should be specified in the MOE and be accepted by the MAA-NLD.

2. (i) Typical tasks that may be certified and/or carried out by the aircraft commander holding a valid licence/national military pilot qualification (or civilian equivalent) acceptable to the MAA-NLD on the aircraft type are minor maintenance or simple checks included in the following list:

- a. Replacement of internal lights, filaments and flash tubes.
- b. Closing of cowlings and refitting of quick access inspection panels.
- c. Simple configuration changes (e.g. stretcher fit, FLIR, doors, photographic equipment etc.)
- d. Inspection for and removal of de-icing/anti-icing fluid residues, including removal/closure of panels, cowls or covers that are easily accessible but not requiring the use of special tools.
- e. Any check/replacement involving simple techniques consistent with this AMC and as agreed by the MAA-NLD.

2. (ii) Holders of a valid national military flight engineer licence/qualification, or equivalent, acceptable to the MAA-NLD, on the aircraft type may only exercise this limited certification authorisation privilege when performing the duties of a flight engineer.

In addition to paragraph 2(i)(a) to (e), other typical minor maintenance or simple defect rectification tasks that may be carried out are included in the following list:

- a. Replacement of wheel assemblies.
- b. Replacement of simple emergency equipment that is easily accessible.
- c. Replacement of ovens, boilers and beverage makers.

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- d. Replacement of external lights.
- e. Replacement of passenger and cabin crew seats, seat belts and harnesses.
- f. Simple replacement of overhead storage compartment doors and cabin furnishing items.
- g. Replacement of static wicks.
- h. Replacement of aircraft main and APU aircraft batteries.
- i. Replacement of inflight entertainment system components other than public address.
- j. The de-activation only of subsystems and aircraft components as permitted by the Operating Organisation's MEL where relevant or a national equivalent procedure, where such de-activation is agreed by the MAA-NLD as a simple task.
- k. Re-setting of tripped circuit breakers under the guidance of maintenance control.
- l. Any other task agreed by the MAA-NLD as a simple task for a particular aircraft type.

3. The authorisation should have a finite life of twelve months subject to satisfactory re-current training on the applicable aircraft type.

GM 145.A.30(j)(4) Personnel requirements (Flight crew)

For military aircrew, the theoretical knowledge is covered throughout flying training and, for specific aircraft types, during operational conversion training for the relevant aircraft type. Thereafter, the individual's level of knowledge is monitored by the pMS' aircrew standards organisation for that specific type.

AMC 145.A.30(j)(5) Personnel requirements

1. For the purposes of this subparagraph "unforeseen" means that the aircraft grounding could not reasonably have been predicted by the Operating Organisation because the defect was unexpected due to being part of a hitherto reliable system.

2. A one-off authorisation should only be considered for issue by the maintenance organisation after it has made a reasoned judgement that such a requirement is appropriate under the circumstances and at the same time maintaining the required airworthiness standards. The maintenance organisation should assess each situation individually prior to the issuance of a one-off authorisation. The maintenance organisation that issues this one-off authorisation retains responsibility for all work performed.

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3. A one-off authorisation should not be issued where the level of certification required could exceed the knowledge and experience level of the person it is issued to. In all cases, due consideration should be given to the complexity of the work involved and the availability of required tooling and/or test equipment needed to complete the work.

AMC 145.A.30(j)(5)(i) Personnel requirements

In those situations where the requirement for a one-off authorisation to issue a CRS for a task on an aircraft type for which certifying staff does not hold a type-rated authorisation has been identified, the following procedure is recommended:

1. Flight crew should communicate full details of the defect to their maintenance organisation. If necessary, the maintenance organisation should consider the issue of a one-off authorisation.

2. When issuing a one-off authorisation, the maintenance organisation should verify that:

a) Full technical details relating to the work required to be carried out have been established and passed on to the certifying staff; and

b) The maintenance organisation has an approved procedure in place for coordinating and controlling the total maintenance activity undertaken at the location under the authority of the one-off authorisation; and

c) The person to whom a one-off authorisation is issued has been provided with all the necessary information and guidance relating to maintenance data and any special technical instructions associated with the specific task undertaken. A detailed step by step worksheet has been defined by the maintenance organisation, communicated to the one-off authorisation holder; and

d) The person holds authorisations of equivalent level and scope on other aircraft type of similar technology, construction and systems.

3. The one-off authorisation holder should sign-off the detailed step by step worksheet when completing the work steps. The completed tasks should be verified by visual examination and/or normal system operation upon return to an appropriately approved NLD-MAR-145 maintenance facility.

AMC 145.A.30(j)(5)(ii) Personnel requirements

This paragraph addresses staff not employed by the maintenance organisation who meet the requirements of NLD-MAR-145.A.30(j)(5). In addition to the items listed in AMC NLD-MAR-145.A.30(j)(5)(i), paragraph 1, 2(a), (b) and (c) and 3 the maintenance organisation may issue such a one-off authorisation subject to full qualification details relating to the proposed certifying personnel being verified by the maintenance organisation and made available at the location.

GM 145.A.30(k) Personnel requirements

Appropriate extensions concern NLD-MAR-66.A.25(e) modules 50-55.

AMC 145.A.35(a) Certifying staff and support staff

1. Holding a MAML with the relevant Military Aircraft Type/Group Rating, or a national qualification in the case of components, does not mean by itself that the holder is qualified to be authorised as certifying staff and/or support staff. The maintenance organisation is responsible to assess the competence of the holder for the scope of maintenance to be authorised.

2. The sentence *“the maintenance organisation shall ensure that certifying staff and support staff have an adequate understanding of the relevant aircraft and/or components to be maintained together with the associated maintenance organisation procedures”* means that the person has received training and has been successfully assessed on:

- the type of aircraft or component;
- the differences on:
 - the particular model/variant;
 - the particular configuration.

The maintenance organisation should specifically ensure that the individual competencies have been established with regard to:

- relevant knowledge, skills and experience in the product type and configuration to be maintained, taking into account the differences between the generic Military Aircraft Type Rating training that the person received and the specific configuration of the aircraft to be maintained;
- appropriate attitude towards safety and observance of procedures;
- knowledge of the associated maintenance organisation and Operating Organisation procedures (i.e. handling and identification of components, MEL use, Aircraft Technical Log use, independent checks, etc.).

3. Some special maintenance tasks may require additional specific training and experience, including but not limited to:

- in-depth troubleshooting;
- very specific adjustment or test procedures;
- rigging;
- engine run-up, starting and operating the engines, checking engine performance characteristics, normal and emergency engine operation, associated safety precautions and procedures;

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- extensive structural/system inspection and repair;
- other specialised maintenance required by the AMP.

For engine run-up training, simulators and/or real aircraft should be used.

4. The satisfactory assessment of the competence should be conducted in accordance with a procedure approved by the MAA-NLD (item 3.4 of the MOE, as described in AMC NLD-MAR-145.A.70(a)).

5. The maintenance organisation should hold copies of all documents that attest the competence and recent experience for the period described in NLD-MAR-145.A.35(j).

Additional information is provided in AMC NLD-MAR-66.A.20(b)3.

AMC 145.A.35(b) Certifying staff and support staff

The maintenance organisation issues the certification authorisation when satisfied that compliance has been established with the appropriate paragraphs of NLD-MAR-145 and NLD-MAR-66. Before granting an certification authorisation to certify aircraft maintenance, the AMO needs to be satisfied that the person holds a valid MAML.

AMC 1 145.A.35(c) Certifying staff and support staff

For the interpretation of “*6 months of actual relevant aircraft maintenance experience in any consecutive 2-year period*”, the provisions of AMC NLD-MAR-66.A.20(b)2 are applicable.

AMC 2 145.A.35(c) Certifying staff and support staff

Where unpredictable variations in operational military tasking require the use of personnel not meeting the six-month experience requirement, this should be approved by the Accountable Manager on a temporary basis only with the necessary precaution/mitigation put in place and both the Operating Organisation/CAMO for which work is being conducted and the MAA-NLD should be informed.

AMC 145.A.35(d) Certifying staff and support staff

1. Continuation training is a two way process to ensure that certifying staff and support staff remain current in terms of procedures, human factors and technical knowledge and that the maintenance organisation receives feedback on the adequacy of its procedures and maintenance instructions. Due to the interactive nature of this training, the maintenance organisation should consider the involvement of the safety and quality department to ensure that feedback is actioned. Alternatively, there should be a procedure to ensure that feedback is formally passed from the training department to the safety and quality department to initiate action.

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2. Continuation training should cover changes in relevant requirements such as NLD-MAR-145, changes in maintenance organisation procedures and the modification standard of the products being maintained plus human factor issues identified from any internal or external analysis of incidents. It should also address instances where staff failed to follow procedures and the reasons why particular procedures are not always followed. In many cases the continuation training should reinforce the need to follow procedures and ensure that incomplete or incorrect procedures are identified to the maintenance organisation in order that they can be corrected. This does not preclude the possible need to carry out a quality audit of such procedures.

3. Continuation training should be of sufficient duration in each 2 year period to meet the intent of NLD-MAR-145.A.35(d) and may be split into a number of separate elements. NLD-MAR-145.A.35(d) requires such training to keep certifying staff and support staff updated in terms of relevant technology, procedures and human factors issues which means it is one part of ensuring quality and safety. Therefore sufficient duration should be related to relevant audit findings and other internal/external sources of information available to the maintenance organisation on human errors in maintenance. This means that in the case of a maintenance organisation that maintains aircraft with few relevant audit findings, continuation training could be limited to days rather than weeks, whereas a similar maintenance organisation with a number of relevant audit findings, such training may take several weeks. For an maintenance organisation that maintains aircraft components, the duration of continuation training would follow the same philosophy but should be scaled down to reflect the more limited nature of the activity. For example certifying staff who release hydraulic pumps may only require a few hours of continuation training whereas those who release turbine engines may require a few days of such training. The content of continuation training should be related to relevant audit findings, hazards and related safety risks identified. It is recommended that such training is reviewed at least once in every 24 month period.

4. The method of training is intended to be a flexible process and could, for example, include an NLD-MAR-147 continuation training course, aeronautical college courses, internal short duration courses, seminars, etc. The elements, general content and length of such training should be specified in the MOE unless such training is undertaken by an NLD-MAR-147 Maintenance Training Organisation (MTO) when such details may be specified under the approval and cross referenced in the MOE.

AMC 145.A.35(e) Certifying staff and support staff

The programme for continuation training should list all certifying staff and support staff and when training will take place, the elements of such training and an indication that it was carried out reasonably on time as planned. Such information should subsequently be transferred to the certifying staff and support staff record as required by NLD-MAR-145.A.35(j).

AMC 145.A.35(f) Certifying staff and support staff

As stated in NLD-MAR-145.A.35(f), except where any of the unforeseen cases of NLD-MAR-145.A.30(j)(5) applies, all prospective certifying staff and support staff should be assessed for competence related to their intended duties in accordance with AMCs 1, 2, 3 and 4 to NLD-MAR-145.A.30(e), as applicable.

AMC 1 145.A.35(i) Certifying staff and support staff

'An individual' means the Quality Manager in the NLD-MAS.

AMC 2 145.A.35(i) Certifying staff and support staff

The Quality Manager may nominate other persons to actually issue or revoke the certification authorisations or the determination if persons can be qualified as support staff in accordance with a procedure as specified in the MOE.

AMC 145.A.35(j) Certifying staff and support staff

1. The following minimum information as applicable should be kept on record in respect of each certifying staff and support staff:

- a. Name
- b. Rank/Grade and Service Number (if applicable)
- c. Date of Birth
- d. Basic Training
- e. Military Aircraft Type Training/Task Training
- f. Continuation Training
- g. Experience
- h. Qualifications relevant to the authorisation
- i. Scope of the authorisation
- j. Date of first issue of the authorisation
- k. If appropriate – expiry date of the authorisation
- l. Identification Number of the authorisation
- m. Security clearance (where applicable).

2. The record may be kept in any format and should be controlled by the maintenance organisation.

3. Persons authorised to access the system should be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner or that such confidential records become accessible to unauthorised persons.

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4. The MAA-NLD or qualified entity acting on behalf of the MAA-NLD is to be considered as an 'authorised person' when investigating the records system for initial and continued approval or when the MAA-NLD has cause to doubt the competence of a particular person.

AMC 145.A.35(n) Certifying staff and support staff

1. It is the responsibility of the AMO issuing the Category A certifying staff authorisation to ensure that the task training received by this person covers all the tasks to be authorised. This is particularly important in those cases where the task training has been provided by an AMO different from the one issuing the authorisation.

2. "Appropriately approved in accordance with NLD-MAR-145" means an AMO holding a maintenance organisation approval for the corresponding aircraft type.

AMC 145.A.35(o) Certifying staff and support staff

1. The privilege for a Category B2 MAML holder to release minor scheduled line maintenance and simple defect rectification in accordance with NLD-MAR-66.A.20(a)(3)(ii) can only be granted by the AMO where the MAML holder is employed/contracted after meeting all the requirements specified in NLD-MAR-145.A.35(o). This privilege cannot be transferred to another maintenance organisation.

It is the responsibility of the AMO issuing the Category A certifying staff authorisation to ensure that the task training received by this person covers all the tasks to be authorised. This is particularly important in those cases where the task training has been provided by an AMO different from the one issuing the authorisation.

2. When a Category B2 MAML holder already holds a certifying staff authorisation containing minor scheduled line maintenance and simple defect rectification for a particular aircraft type, new tasks relevant to Category A can be added to that type without requiring another 6 months of experience. However, task training (theoretical plus practical hands-on) and examination/assessment for these additional tasks is still required.

3. When the certifying staff authorisation intends to cover several aircraft types, the experience may be combined within a single 6-month period.

For the addition of new aircraft types to the certifying staff authorisation, another 6 months should be required unless the aircraft is considered similar per AMC NLD-MAR-66.A.20(b)2 to the one already held.

4. The term "6 months of experience" can include either full-time employment or part-time employment. The important aspect is that the person has been involved during a period of 6 months (not necessarily every day) in those tasks which are going to be part of the authorisation.

GM 145.A.35(o) Certifying staff and support staff

'Unless approved otherwise by the MAA-NLD' in this context means that the requirement can be waived by the MAA-NLD in the case of military personnel that already hold this privilege when they are posted from one AMO to another.

AMC 145.A.40(a) Equipment, tools and material

Once the applicant for approval has determined the intended scope of approval for consideration by the MAA-NLD, it should be necessary to show that all tools and equipment as specified in the maintenance data can be made available when needed. All such tools and equipment that require to be controlled in terms of servicing or calibration by virtue of being necessary to measure specified dimensions and torque figures etc., should be clearly identified and listed in a control register including any personal tools and equipment that the maintenance organisation agrees can be used.

AMC 145.A.40(b) Equipment, tools and material

1. The control of these tools and equipment requires that the maintenance organisation has a procedure to inspect/service and, where appropriate, calibrate such items on a regular basis and indicate to users that the item is within any inspection or service or calibration time-limit. A clear system of labelling all tooling, equipment and test equipment is therefore necessary giving information on when the next inspection or service or calibration is due and if the item is unserviceable for any other reason where it may not be obvious. A register should be maintained for all precision tooling and equipment together with a record of calibrations and standards used.

2. Inspection, service or calibration on a regular basis should be in accordance with the equipment manufacturers' instructions unless approved otherwise by the MAA-NLD.

3. In this context officially recognised standard means those standards established or published by an official body whether having legal personality or not, which are widely recognised by the aerospace sector as constituting good practice, or those accepted by the MAA-NLD.

AMC 145.A.42(a) Acceptance of components

1. A document equivalent to an NLD-MAR Form 1 may be:

a) NOT APPLICABLE.

b) NOT APPLICABLE.

c) NOT APPLICABLE.

d) NOT APPLICABLE.

e) NOT APPLICABLE.

f) An EASA Form 1 (if accepted by the MAA-NLD, and not originating from an EASA Part M Subpart F approved organisation).

g) A national equivalent document recognized by the MAA-NLD as declaring an item's serviceability and airworthiness.

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- h) A release document issued by an organisation accepted by the MAA-NLD.
- i) A MAA-NLD Form 1 issued prior to 1 March 2021 by a MAR-145 organisation approved by the MAA-NLD.
- j) A MAA-NLD Form 1 issued by a MAR-145 organisation accredited by the MAA-NLD, with a Certificate of Accreditation published on the MAA-NLD intranet and internet issued before 1 March 2020.

2. See AMC NLD-MAR-145.A.42(a)4 and AMC NLD-MAR-145.A.42(a)5.

GM 145.A.42(a) Acceptance of components

The reason that the EASA Form 1 must be issued by an EASA Part 145 maintenance organisation, not an EASA Part M Subpart F approved organisation is that a Subpart F organisation should not issue parts for 'complex motor-powered' or 'CAT' aircraft. Military aircraft are considered equivalent to 'complex motor-powered' aircraft and 'CAT' aircraft.

AMC 145.A.42(a)2 Acceptance of components

The maintenance organisation performing maintenance should ensure proper identification of any unserviceable components.

The unserviceable status of the component should be clearly declared on a tag or other suitable means together with the component identification data and any information useful to define actions necessary to be taken. Such information should state, as applicable, in-service times, maintenance status, preservation status, failures, defects or malfunctions reported or detected, exposure to adverse environmental conditions or if the component has been involved in or affected by an accident/incident. Means should be provided to prevent unwanted separation of this tag from the component.

AMC 145.A.42(a)3 Acceptance of components

A maintenance organisation may choose, in consultation with the CAMO/Operating Organisation, to release an unsalvageable component for legitimate non-flight uses, such as for training and education, research and development. In such instances, mutilation may not be appropriate. The following methods should be used to prevent the component re-entering the aviation supply system:

- (a) permanently marking or stamping the component, as "NOT SERVICEABLE." (ink stamping is not an acceptable method);
- (b) removing original part number identification;
- (c) removing data plate identification;
- (d) maintaining a tracking or accountability system, by serial number or other individualised data, to record transferred unsalvageable aircraft component;

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(e) including written procedures concerning disposal of such components in any agreement or contract transferring such components.

NOTE: Unsalvageable components should not be released to any person or organisation that is known to return unsalvageable components back into the aviation supply system, due to the potential safety threat. Information about such organisations can be found, for example, in FAA Unapproved Parts Notifications, FAA Special Airworthiness Bulletins or EASA Safety Information Bulletins.

AMC 145.A.42(a)3(ii) Acceptance of components

1. Mutilation should be accomplished in such a manner that the components become permanently unusable for their original intended use. Mutilated components should not be able to be reworked or camouflaged to provide the appearance of being serviceable, such as by re-plating, shortening and re-threading long bolts, welding, straightening, machining, cleaning, polishing, or repainting.

2. Mutilation may be accomplished by one or a combination of the following procedures:

- (a) grinding,
- (b) burning,
- (c) removal of a major lug or other integral feature,
- (d) permanent distortion of parts,
- (e) cutting a hole with a cutting torch or saw,
- (f) melting,
- (g) sawing into many small pieces,
- (h) any other method accepted by the MAA-NLD on a case by case basis.

3. The following procedures are examples of mutilation that are often less successful because they may not be consistently effective:

- (a) stamping or vibro-etching,
- (b) spraying with paint,
- (c) small distortions, incisions or hammer marks,
- (d) identification by tag or markings,
- (e) drilling small holes,
- (f) sawing in two pieces only.

4. Since manufacturers producing approved aircraft components should maintain records of serial numbers for 'retired' certified life-limited or other critical components, the organisation that mutilates a component should inform the original manufacturer unless directed otherwise by the MAA-NLD.

AMC 145.A.42(a)4 Acceptance of components

STANDARD PARTS

(a) For a definition of 'Standard Parts' see NLD-MAD 1.

(b) Documentation accompanying standard parts should clearly relate to the particular parts and contain a conformity statement plus both the manufacturing and supplier source (a Certificate of Conformity is sufficient). Some material is subject to special conditions such as storage condition or life limitation, etc. and this should be included on the documentation and/or material packaging.

(c) An EASA/ NLD-MAR Form 1 or equivalent is not normally issued and therefore none should be expected.

AMC 145.A.42(a)5 Acceptance of components

(a) Consumable material is any material which is only used once, such as lubricants, cements, compounds, paints, chemicals, dyes, and sealants, etc.

(b) Raw material is any material that requires further work to make it into a component part of the aircraft such as metals, plastics, fabric, etc.

(c) Material, both raw and consumable, should only be accepted when satisfied that it is to the required specification. To be satisfied, the material and/or its packaging should be marked with the specification and, where appropriate, the batch number.

(d) Documentation accompanying all material should clearly relate to the particular material and contain a conformity statement plus both the manufacturing and supplier source. Some material is subject to special conditions such as storage condition, or life limitation, etc., and this should be included on the documentation and/or material packaging.

(e) The material specification is normally identified in the M(S)TC holder's data except in the case where the MAA-NLD has agreed otherwise. An EASA/ NLD-MAR Form 1 or equivalent should not be issued for such material, and, therefore, none should be expected.

(f) Items purchased in batches (fasteners, etc.) should be supplied in a package. The packaging should state the applicable specification/standard, P/N, batch number, and the quantity of the items. The documentation accompanying the material should contain the applicable specification/standard, P/N, batch number, supplied quantity, and the manufacturing sources. If the material is acquired from different batches, acceptance documentation for each batch should be supplied.

AMC 145.A.42(b) Acceptance of components

(a) The NLD-MAR Form 1 (or other equivalent forms detailed at AMC NLD-MAR-145.A.42(a)) identifies the status of an aircraft component. Block 12 'Remarks' on the NLD-MAR Form 1 in some cases contains vital airworthiness related information which may need appropriate and necessary actions. The receiving maintenance organisation should be satisfied that the component in question is in satisfactory condition and has been appropriately released to service. In addition, the maintenance organisation should ensure that the component meets the approved data/standard, such as the required design and modification standard. This may be accomplished by reference to the manufacturer's parts catalogue or other approved data (i.e. Service Bulletin). Care should also be taken in ensuring compliance with applicable ADs, the status of any life-limited parts fitted to the aircraft component as well as CDCCLs (if applicable).

(b) To ensure a component is in a satisfactory condition, the maintenance organisation should perform checks and verifications.

(c) Performance of the above checks and verifications should take place before the component is installed on the aircraft.

(d) The following list, though not exhaustive, contains typical checks to be performed:

(i) verify the general condition of components and their packaging in relation to damages that could affect the integrity of the components;

(ii) verify that the shelf life of the component has not expired;

(iii) verify that items are received in the appropriate package in respect of the type of component: e.g. correct ATA 300 or electrostatic sensitive devices packaging, when necessary;

(iv) verify that the component has all plugs and caps appropriately installed in accordance with approved data to prevent damage or internal contamination.

AMC 145.A.42(c) Acceptance of components

1. The agreement by the MAA-NLD for the fabrication of parts by the maintenance organisation should be formalised through the approval of a detailed procedure in the MOE. This AMC contains principles and conditions to be taken into account for the preparation of an acceptable procedure.

2. Fabrication, inspection, assembly and test should be clearly within the technical and procedural capability of the maintenance organisation.

3. All necessary data to fabricate the part should be approved either by the MAA-NLD or the (Military) Type Certificate (TC) holder or NLD-MAR-21 Design Organisation Approval holder, or (Military) Supplemental Type Certificate (STC) holder.

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4. Items fabricated by a maintenance organisation may only be used by that maintenance organisation in the course of overhaul, maintenance, modifications, or repair of aircraft or components undergoing work within its own facility. The fabrication of parts for other facilities may only take place if approved by the MAA-NLD. The permission to fabricate does not constitute approval for manufacture and the parts do not qualify for certification on NLD-MAR Form 1. This prohibition also applies to the bulk transfer of surplus inventory, in that locally fabricated parts are physically segregated and excluded from any delivery certification. Fabricated parts are to be clearly labelled in a manner approved by the MAA-NLD.

5. Fabrication of parts, modification kits etc. for onward supply may not be conducted by an maintenance organisation, unless otherwise approved by the MAA-NLD.

6. The data specified in paragraph 3 may include repair procedures involving the fabrication of parts. Where the data on such parts is sufficient to facilitate fabrication, the parts may be fabricated by an maintenance organisation. Care should be taken to ensure that the data includes details of part numbering, dimensions, materials, processes, and any special manufacturing techniques, special raw material specification or/and incoming inspection requirement and that the maintenance organisation has the necessary capability. That capability should be defined by way of MOE content. Where special processes or inspection procedures are defined in the approved data which are not available at the maintenance organisation, the maintenance organisation cannot fabricate the part unless the (Military) TC/STC-holder or NLD-MAR-21 Design Organisation Approval holder gives an approved alternative.

7. Examples of fabrication under the scope of an NLD-MAR-145 approval can include but are not limited to the following:

- a) Fabrication of bushes, sleeves and shims.
- b) Fabrication of secondary structural elements and skin panels.
- c) Fabrication of control cables.
- d) Fabrication of flexible and rigid pipes.
- e) Fabrication of electrical cable looms and assemblies.
- f) Formed or machined sheet metal panels for repairs.

All the above fabricated parts should be in accordance with data provided in overhaul or repair manuals, modification schemes and service bulletins, drawings or otherwise approved by the MAA-NLD.

Note: It is not acceptable to fabricate any item to pattern unless an engineering drawing of the item is produced which includes any necessary fabrication processes and which is acceptable to the MAA-NLD.

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8. Where a (Military)TC/STC holder or an NLD-MAR-21 Approved Production Organisation is prepared to make available complete data which is not referred to in aircraft manuals or service bulletins but provides manufacturing drawings for items specified in parts lists, the fabrication of these items is not considered to be within the scope of an approval unless agreed otherwise by the MAA-NLD in accordance with a procedure specified in the MOE.

9. Inspection and Identification.

Any locally fabricated part should be subjected to an inspection stage before, separately, and preferably independently from, any inspection of its installation. The inspection should establish full compliance with the relevant manufacturing data, and the part should be unambiguously identified as fit for use by stating conformity to the approved data. Adequate records should be maintained of all such fabrication processes including heat treatment and the final inspections. Fabricated parts are to be clearly labelled in a manner identified by the MAA-NLD. All parts, except those having not enough space, should carry a part number which clearly relates it to the manufacturing/inspection data. Additional to the part-number the maintenance organisation's identity should be marked on the part for traceability purposes.

AMC 145.A.42(d) Acceptance of components

1. The following types of components should typically be classified as unsalvageable:

- a. Components with non-repairable defects, whether visible or not to the naked eye;
- b. Components that do not meet design specifications, and cannot be brought into conformity with such specifications;
- c. Components subjected to unacceptable modification, repair or rework that is irreversible;
- d. Certified life-limited parts that have reached or exceeded their certified life limits, or have missing or incomplete records;
- e. Components that cannot be returned to an airworthy condition due to exposure to extreme forces, heat or adverse environment;
- f. Components for which conformity with an applicable AD cannot be accomplished;
- g. Components for which maintenance records and/or traceability to the manufacturer/maintenance organisation cannot be retrieved.

2. Caution should be exercised to ensure that unsalvageable components are disposed of in a manner that does not allow them to be returned to service.

GM 145.A.42(d) Acceptance of components

It is common practice for possessors of aircraft components to dispose of unsalvageable components by selling, discarding, or transferring such items. In some instances, these items have reappeared for sale and in the active parts inventories of the aviation community. Misrepresentation of the status of components and the practice of making such items appear serviceable have resulted in the use of unsalvageable non-conforming components. Therefore, organisations disposing of unsalvageable aircraft components should consider the possibility of such components later being misrepresented and sold as serviceable components.

AMC 145.A.45(b) Maintenance data

1. Except as specified in subparagraph 5, each AMO should have access to and use the following minimum maintenance data relevant to the AMO's approval class rating: all maintenance related requirements and associated AMCs, approval specifications and Guidance Material, all applicable national maintenance requirements and notices which have not been superseded by a MAA-NLD requirement, procedure or directive and all applicable ADs as well as CDCCLs (if applicable).

2. In addition to subparagraph 1, an AMO with an approval class rating in Category A – Aircraft, should have access to and use the following maintenance data where published: the appropriate sections of the Aircraft Maintenance Programme, Aircraft Maintenance Manual, repair manual, supplementary structural inspection document, corrosion control document, Service Bulletins, service letters, service instructions, modification leaflets, NDT manual, parts catalogue, (Military) TC data sheet and any other specific document issued by the (Military) TC/STC holder or MAA-NLD as maintenance data.

3. In addition to subparagraph 1, an AMO with an approval class rating in Category B — Engines/APUs, should have access to and use the following maintenance data where published: the appropriate sections of the engine/APU maintenance and repair manual, Service Bulletins, service letters, modification leaflets, non-destructive testing (NDT) manual, parts catalogue, (Military) Type Certificate data sheet and any other specific document issued by the (Military) TC/STC holder or MAA-NLD as maintenance data.

4. In addition to subparagraph 1, an AMO with an approval class rating in Category C – Components other than complete engines/APUs, should have access to and use the following maintenance data where published: the appropriate sections of the component maintenance and repair manual, Service Bulletins and service letters plus any document issued by the (Military) TC/STC holder or MAA-NLD as maintenance data on whose product the component may be fitted when applicable.

5. Appropriate sections of the subparagraphs 2 to 4 additional maintenance data means in relation to the maintenance work scope at each particular maintenance facility. For example, a base maintenance facility should have access to almost complete set(s) of the maintenance data whereas a line maintenance facility may need only the maintenance manual and the parts catalogue.

6. An AMO only approved in class rating Category D – Specialised services, should hold and use all applicable specialised service(s) process specifications.

AMC 145.A.45(c) Maintenance data

1. The referenced procedure should ensure that when maintenance personnel discover inaccurate, incomplete or ambiguous information in the maintenance data they should record the details. The procedure should then ensure that the maintenance organisation notifies the problem to the author of the maintenance data in a timely manner. A record of such communications to the author of the maintenance data should be retained by the maintenance organisation until such time as the (Military) TC/STC holder, NLD-MAR-21 Design Organisation Approval holder or MAA-NLD has clarified the issue by e.g. amending the maintenance data.

2. The referenced procedure should be specified in the MOE.

AMC 145.A.45(d) Maintenance data

The referenced procedure should address the need for a practical demonstration by the maintenance personnel to the quality personnel of the proposed modified maintenance instruction. Depending on the nature of the modification the safety manager should perform a safety risk assessment. When satisfied the quality personnel should approve the modified maintenance instruction and ensure that the (Military) TC/STC holder, NLD-MAR-21 Design Organisation Approval holder or MAA-NLD is informed of the modified maintenance instruction. The procedure should include a paper/electronic traceability of the complete process from start to finish and ensure that the relevant maintenance instruction clearly identifies the modification. Modified maintenance instructions should only be used in the following circumstances:

- a. Where the (Military) TC/STC holder, NLD-MAR-21 Design Organisation Approval holder or MAA-NLD's original intent can be carried out in a more practical or more efficient manner.
- b. Where the (Military) TC/STC holder, NLD-MAR-21 Design Organisation Approval holder or MAA-NLD's original intent cannot be achieved by following the maintenance instructions. For example, where a component cannot be replaced following the original maintenance instructions.
- c. For the use of alternative tools/equipment.

Important Note: CDCCLs are airworthiness limitations. Any modification of the maintenance instructions linked to CDCCLs constitutes an aircraft modification that should be approved in accordance with NLD-MAR-21.

AMC 145.A.45(e) Maintenance data

1. The maintenance organisation should:
 - a. Transcribe accurately the maintenance data onto such work cards or worksheets, or
 - b. Make precise reference to the particular maintenance task(s) contained in such maintenance data, which already identifies the task as a CDCCL where applicable.
2. Relevant parts of the maintenance organisation means with regard to aircraft base maintenance, aircraft line maintenance, engine workshops, mechanical workshops and avionic workshops. Therefore, engine workshops for example should have a common system throughout such engine workshops that may be different to that in the aircraft base maintenance.
3. The work cards should differentiate and specify, when relevant, disassembly, accomplishment of task, reassembly and testing. In the case of a lengthy maintenance task involving a succession of personnel to complete such a task, it may be necessary to use supplementary work cards or worksheets to indicate what was actually accomplished by each individual person.

GM 145.A.45(e) Maintenance Data

'Complex maintenance tasks' are neither minor scheduled line maintenance tasks nor simple defect rectification tasks. They therefore cannot be certified by a Category A MAML holder.

AMC 145.A.45(f) Maintenance data

1. Data being made available to personnel maintaining aircraft means that the data should be available in close proximity to the aircraft being maintained for supervisors, mechanics, certifying and support staff to study.
2. Where computer systems are used, the number of computer terminals or maintenance data access points should be sufficient in relation to the size of the work programme to enable easy access, unless the computer system can produce paper copies. Where microfilm or microfiche readers/printers are used, a similar requirement is applicable.

AMC 145.A.45(g) Maintenance data

1. To keep data up-to-date, a procedure should be set up to monitor the amendment status of all data and maintain a check that all amendments are being received by being a subscriber to any document amendment scheme. Special attention should be given to (Military) TC/STC related data such as certification life-limited parts, airworthiness limitations and Airworthiness Limitation Items (ALI), etc.
2. If paper copies are printed from computer systems, a procedure should be in place to ensure the control or destruction of such copies after use.

AMC 145.A.47(a) Maintenance planning

1. Depending on the amount and complexity of work generally performed by the maintenance organisation, the planning system may range from a very simple procedure to a complex organisational set-up including a dedicated planning function in support of the maintenance function.

2. For the purpose of NLD-MAR-145, the maintenance planning function should include two complementary elements:

- scheduling the maintenance work ahead, to ensure that it will not adversely interfere with other work as regards the availability of all necessary personnel, tools, equipment, material, maintenance data and facilities.
- during maintenance work, organising maintenance teams and shifts and provide all necessary support to ensure the completion of maintenance without undue time pressure.

3. When establishing the maintenance planning procedure, consideration should be given to the following:

- logistics,
- inventory control,
- square meters of accommodation,
- man-hours estimation,
- man-hours availability,
- preparation of work,
- hangar availability,
- environmental conditions (access, lighting standards and cleanliness),
- co-ordination with contracted/tasked maintenance organisations, internal and external suppliers, etc.
- scheduling of safety critical tasks during periods when staff are likely to be most alert,
- military operational commitments,
- location (e.g. Main Operating Base, Deployed Operating Base).

AMC 145.A.47(b) Maintenance planning

Limitations of human performance, in the context of planning safety related tasks, refers to the upper and lower limits, and variations, of certain aspects of human performance (Circadian rhythm / 24 hours body cycle) which personnel should be aware of when planning work and shifts.

AMC 145.A.47(c) Maintenance planning

The primary objective of the changeover / handover information is to ensure effective communication at the point of handing over the continuation or completion of maintenance actions. Effective task and shift handover depends on three basic elements:

- a. The outgoing person's ability to understand and communicate the important elements of the job or task being passed over to the incoming person.
- b. The incoming person's ability to understand and assimilate the information being provided by the outgoing person.
- c. 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.

AMC 145.A.48(b) Performance of maintenance

(a) The manufacturer's Instructions for Continuing Airworthiness should be followed when determining the need for an independent inspection.

(b) In the absence of maintenance and inspection standards published by the organisation responsible for the type design, maintenance tasks that involve the assembly or any disturbance of a control system and that, if errors occurred, could result in a failure, malfunction, or defect endangering the safe operation of the aircraft should be considered as flight safety sensitive maintenance tasks needing an independent inspection. A control system is an aircraft system by which the flight path, attitude, or propulsive force of the aircraft is changed, including the flight, engine and propeller controls (but not limited to these systems), the related system controls and the associated operating mechanisms. Maintenance tasks associated with the crew escape and safety systems should also be considered as flight safety sensitive maintenance tasks.

(c) A maintenance task requiring an independent inspection consists of an authorised person signing the maintenance task/release, who assumes full responsibility for the satisfactory completion of the work, before being subsequently inspected by an independent competent and authorised person who attests to the satisfactory completion of the work recorded and that no deficiencies have been found.

(1) A maintenance task requiring an independent inspection should therefore involve at least two persons, to ensure correct assembly, locking and sense of operation. A technical record of the inspection should contain the signatures of both persons before the relevant certificate of release to service is issued.

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(2) The independent competent and authorised person is not issuing a maintenance release, therefore, is not required to hold certification privileges. However, they should be suitably qualified to carry out the inspection and must not have been involved in the work.

(d) The maintenance organisation should have procedures to demonstrate that independent signatories have been trained, and have gained experience on the specific systems being inspected.

(e) The following maintenance tasks should primarily be considered when inspecting aircraft control and crew escape and safety systems that have been disturbed:

- (1) installation, rigging, and adjustment of flight controls;
- (2) installation of aircraft engines, propellers; and rotors; and
- (3) overhaul, calibration or rigging of components such as engines, propellers, transmissions and gearboxes; and
- (4) installation and maintenance carried out on ejection seats.

Consideration should also be given to:

- (1) previous experience of maintenance errors, depending on the consequences of the failure; and
- (2) information arising from an 'occurrence reporting system'; and
- (3) information arising from the Operating Organisation/CAMO.

(f) When inspecting control systems and crew escape and safety systems that have undergone maintenance, the person signing the maintenance release and the person performing the independent inspection should consider the following points independently:

- (1) all those parts of the system that have actually been disconnected or disturbed, should be inspected for correct assembly and locking;
- (2) the system as a whole should be inspected for full and free movement over the complete range;
- (3) cables should be tensioned correctly with adequate clearance at secondary stops;
- (4) the operation of the system as a whole should be observed to ensure that the controls are operating in the correct sense;
- (5) if the system is duplicated to provide redundancy, each system should be inspected separately; and
- (6) if different systems are interconnected so that they affect each other, all interactions should be inspected through the full range of the applicable controls.

AMC 145.A.48(c) Performance of maintenance

An assessment of both the cause and any potentially hazardous effect of any defect or combination of defects that could affect flight safety should be made in order to initiate any necessary further investigation and analysis necessary to identify the root cause of the defect and reported to the CAMO/Operating Organisation.

GM 145.A.50(a) Certification of maintenance

'Endanger flight safety' means any instance where safe operation could not be assured or which could lead to an unsafe condition. It typically includes, but is not limited to, significant cracking, deformation, corrosion or failure of primary structure, any evidence of burning, electrical arcing, significant hydraulic fluid or fuel leakage and any emergency system or total system failure. An AD overdue for compliance is also considered a hazard to flight safety.

AMC 145.A.50(b) Certification of maintenance

1. The CRS for aircraft maintenance should contain the following statement:

'Certifies that the work specified, except as otherwise specified, was carried out in accordance with NLD-MAR-145 and in respect to that work the aircraft/aircraft component is considered ready for release to service'.

Reference should also be made to the NLD-MAR-145 approval number.

2. It is acceptable to use an alternate abbreviated CRS for aircraft maintenance consisting of the following statement 'NLD-MAR-145 release to service' instead of the full certification statement specified in paragraph 1. When the alternate abbreviated CRS is used, the introductory section of the aircraft technical log should include an example of the full certification statement from paragraph 1.

3. The CRS should relate to the task specified in the (Military) TC/STC holder's or Operating Organisation's/CAMO's instructions or the Aircraft Maintenance Programme which itself may cross-refer to maintenance data.

4. The date such maintenance was carried out should include when the maintenance took place relative to any life or overhaul limitation in terms of date/flying hours/cycles/landings etc., as appropriate.

5. When extensive maintenance has been carried out, it is acceptable for the CRS to summarise the maintenance as long as there is a unique cross-reference to the work package containing full details of maintenance carried out. Dimensional information should be retained in the work-pack record.

AMC 1 145.A.50(d) Certification of maintenance

1. The purpose of the CRS is to release assemblies/items/components/parts (hereafter referred to as 'item(s)') after maintenance and to release maintenance work carried out on such items under the approval of a MAA-NLD and to allow items removed from one aircraft/aircraft component to be fitted to another aircraft/aircraft component.
2. The CRS is to be used for export/import purposes, the transfer of items between pMS as well as for domestic purposes, and serves as an official certificate for items from the manufacturer/AMO to users.
3. It can only be issued by AMOs within the scope of their approval.
4. The CRS may be used as a rotatable tag (if using NLD-MAR Form 1 – national equivalents may be able to be used this way also) by utilising the available space on the reverse side of the certificate for any additional information and dispatching the item with two copies of the certificate so that one copy may be eventually returned with the item to the AMO. The alternative solution is to use existing rotatable tags and also supply a copy of the certificate.
5. A CRS should not be issued for any item when it is known that the item is unserviceable except in the case of an item undergoing a series of maintenance processes at several AMOs and the item needs a certificate for the previous maintenance process carried out for the next AMO to accept the item for subsequent maintenance processes. In such a case, a clear statement of limitation should be endorsed in Block 12 of NLD-MAR Form 1 (or equivalent).

AMC 2 145.A.50(d) Certification of maintenance

1. A component which has been maintained off the aircraft needs the issuance of a CRS for such maintenance and another CRS in regard to being installed properly on the aircraft when such action occurs.
2. In the case of the issue of NLD-MAR Form 1 (or equivalent) for components in storage before NLD-MAR-145 and NLD-MAR-21 became effective and not released on an NLD-MAR Form 1 or equivalent in accordance with NLD-MAR 145.A.42(a) or removed serviceable from a serviceable aircraft or an aircraft which has been withdrawn from service the following applies:
 - 2.1. An NLD-MAR Form 1 (or equivalent) may be issued for an aircraft component which has been:
 - 2.1.1 Maintained before NLD-MAR-145 became effective or manufactured before NLD-MAR-21 became effective.
 - 2.1.2 Used on an aircraft and removed in a serviceable condition. Examples include leased and loaned aircraft components, or “cannibalised” components.

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2.1.3 Removed from aircraft which have been withdrawn from service, or from aircraft which have been involved in abnormal occurrences such as accidents, incidents, heavy landings or lightning strikes.

2.1.4 Maintained by an unapproved maintenance organisation.

2.2. An appropriately rated AMO may issue an NLD-MAR Form 1 (or equivalent) as detailed in this AMC subparagraph 2.5 to 2.9, as appropriate, in accordance with procedures detailed in the MOE as approved by the MAA-NLD. The appropriately rated AMO is responsible for ensuring that all reasonable measures have been taken to ensure that only approved and serviceable aircraft components are issued an NLD-MAR Form 1 (or equivalent) under this paragraph.

2.3. For the purposes of this AMC 2 only, 'appropriately rated' means an AMO with an approval class rating for the type of component or for the product in which it may be installed.

2.4. An NLD-MAR Form 1 (or equivalent) issued in accordance with this paragraph 2 should be issued by signing in Block 14b and stating 'Inspected' in Block 11. In addition, Block 12 should specify:

2.4.1. When the last maintenance was carried out and by whom.

2.4.2. If the component is unused, when the component was manufactured and by whom with a cross-reference to any original documentation which should be included with the Form.

2.4.3. A list of all ADs, repairs and modifications known to have been incorporated. If no ADs or repairs or modifications are known to be incorporated, then this should be so stated.

2.4.4. Detail of life used for service life-limited parts being any combination of fatigue, overhaul or storage life.

2.4.5. For any aircraft component having its own maintenance history record, reference to the particular maintenance history record as long as the record contains the details that would otherwise be required in Block 12. The maintenance history record and acceptance test report or statement, if applicable, should be attached to the NLD-MAR Form 1 (or equivalent).

2.5. New/unused aircraft components.

2.5.1 Any unused aircraft component in storage without an NLD-MAR Form 1 (or equivalent) up to the effective date(s) for NLD-MAR-21 that was manufactured by an organisation acceptable to the MAA-NLD at that time may be issued with an NLD-MAR Form 1 (or equivalent) by an appropriately rated AMO. The NLD-MAR Form 1 (or equivalent) should be issued in accordance with the following subparagraphs which should be included in a procedure within the MOE.

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Note: It should be understood that the release of a stored but unused aircraft component in accordance with this paragraph represents a maintenance release under NLD-MAR-145 and not a production release under NLD-MAR-21. It is not intended to by-pass the production release procedure agreed by the pMS for parts and subassemblies intended for fitment on the manufacturer's own production line.

(a) An acceptance test report or statement should be available for all used and unused aircraft components that are subjected to acceptance testing after manufacturing or maintenance as appropriate.

(b) The aircraft component should be inspected for compliance with the manufacturer's instructions and limitations for storage and condition including any requirement for limited storage life, inhibitors, controlled climate and special storage containers. In addition, or in the absence of specific storage instructions, the aircraft component should be inspected for damage, corrosion and leakage to ensure good condition. Where military operational circumstances have prevented storage in accordance with the manufacturer's instructions, a procedure approved by the MAA-NLD should be defined and adhered to.

(c) The storage life used of any storage life-limited parts should be established.

2.5.2. If it is not possible to establish satisfactory compliance with all applicable conditions specified in subparagraph 2.5.1 (a) to (c) inclusive, the aircraft component should be disassembled by an appropriately rated AMO and subjected to a check for incorporated ADs, repairs and modifications and inspected/tested in accordance with the maintenance data to establish satisfactory condition and, if relevant, all seals, lubricants and life-limited parts should be replaced. Upon satisfactory completion after reassembly, an NLD-MAR Form 1 (or equivalent) may be issued stating what was carried out and the reference of the maintenance data included.

2.6. Used aircraft components removed from a serviceable aircraft.

2.6.1. Serviceable aircraft components removed from a pMS registered aircraft may be issued with an NLD-MAR Form 1 (or equivalent) by an appropriately rated AMO subject to compliance with this subparagraph.

(a) The AMO should ensure that the component was removed from the aircraft by an appropriately qualified person.

(b) The aircraft component may only be deemed serviceable if the last flight operation with the component fitted revealed no faults on that component/related system.

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(c) The aircraft component should be inspected for satisfactory condition including in particular damage, corrosion or leakage and compliance with any additional maintenance data.

(d) The aircraft record should be researched for any unusual events that could affect the serviceability of the aircraft component such as involvement in accidents, incidents, heavy landings or lightning strikes. Under no circumstances may an NLD-MAR Form 1 (or equivalent) be issued in accordance with this paragraph 2.6 if it is suspected that the aircraft component has been subjected to extremes of stress, temperatures or immersion which could affect its operation.

(e) A maintenance history record should be available for all used serialised aircraft components.

(f) Compliance with known modifications and repairs should be established.

(g) The flight hours/cycles/landings as applicable of any service life-limited parts including time since overhaul should be established.

(h) Compliance with known applicable ADs should be established.

(i) Subject to satisfactory compliance with this subparagraph 2.6.1, an NLD-MAR Form 1 (or equivalent) may be issued and should contain the information as specified in paragraph 2.4 including the aircraft from which the aircraft component was removed.

2.6.2. NOT APPLICABLE.

2.7. Used aircraft components removed from an aircraft withdrawn from service.

Serviceable aircraft components removed from an aircraft withdrawn from service may be issued with an NLD-MAR Form 1 (or equivalent) by an AMO subject to compliance with this subparagraph.

(a) Aircraft withdrawn from service are sometimes dismantled for spares. This is considered to be a maintenance activity and should be accomplished under the control of an AMO, employing procedures approved by the MAA-NLD.

(b) To be eligible for installation, components removed from such aircraft may be issued with an NLD-MAR Form 1 (or equivalent) by an appropriately rated AMO following a satisfactory assessment.

(c) As a minimum, the assessment will need to satisfy the standards set out in paragraphs 2.5 and 2.6 as appropriate. This should, where known, include the possible need for the alignment of scheduled maintenance that may be necessary to comply with the

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maintenance programme applicable to the aircraft on which the component is to be installed.

(d) Irrespective of whether the aircraft holds a Military Certificate of Airworthiness or not, the AMO responsible for certifying any removed component should ensure that the manner in which the components were removed and stored are compatible with the standards required by NLD-MAR-145.

(e) A structured plan should be formulated to control the aircraft disassembly process. The disassembly is to be carried out by an appropriately rated AMO under the supervision of certifying staff who will ensure that the aircraft components are removed and documented in a structured manner in accordance with the appropriate maintenance data and disassembly plan.

(f) All recorded aircraft defects should be reviewed and the possible effects these may have on both normal and standby functions of removed components are to be considered.

(g) Dedicated control documentation is to be used as detailed by the disassembly plan, to facilitate the recording of all maintenance actions and component removals performed during the disassembly process. Components found to be unserviceable are to be identified as such and quarantined pending a decision on the actions to be taken. Records of the maintenance accomplished to establish serviceability are to form part of the component maintenance history.

(h) Suitable NLD-MAR-145 facilities for the removal and storage of removed components are to be used which include suitable environmental conditions, lighting, access equipment, aircraft tooling and storage facilities for the work to be undertaken. While it may be acceptable for components to be removed, given local environmental conditions, without the benefit of an enclosed facility, subsequent disassembly (if required) and storage of the components should be in accordance with the manufacturer's recommendations.

2.8. Used aircraft components maintained by maintenance organisations not approved in accordance with NLD-MAR-145.

For used components maintained by a maintenance organisation not approved under NLD-MAR-145, due care should be taken before acceptance of such components. In such cases an appropriately rated AMO should establish satisfactory conditions by:

(a) dismantling the component for sufficient inspection in accordance with the appropriate maintenance data;

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(b) replacing all service life-limit components when no satisfactory evidence of life used is available and/or the components are in an unsatisfactory condition;

(c) reassembling and testing as necessary the component;

(d) completing all certification requirements as specified in NLD-MAR-145.A.50.

2.9. Used aircraft components removed from an aircraft involved in an accident or incident.

Such components should only be issued with an NLD-MAR Form 1 (or equivalent) when processed in accordance with paragraph 2.7 and a specific work order including all additional necessary tests and inspections deemed necessary by the accident or incident. Such a work order may require input from the MAA-NLD/(Military) TC/STC holder or original manufacturer as appropriate. This work order should be referenced in Block 12.

AMC 145.A.50(e) Certification of maintenance

1. Being unable to establish full compliance with subparagraph NLD-MAR-145.A.50(a) means that the maintenance required by the operating organisation/CAMO could not be completed due either to running out of available aircraft maintenance downtime for the scheduled check or by virtue of the condition of the aircraft requiring additional maintenance downtime.

2. The operating organisation/CAMO is responsible for ensuring that all required maintenance has been carried out before flight and therefore NLD-MAR-145.A.50(e) requires the operating organisation/CAMO to be informed in the case where full compliance with NLD-MAR-145.A.50(a) cannot be achieved. If the operating organisation/CAMO agrees to the deferment of full compliance, then the 'CRS for aircraft' may be issued subject to details of the deferment, including the operating organisation/CAMO's authority, being endorsed on the certificate.

Note: Whether or not the operating organisation/CAMO does have the authority to defer maintenance is an issue between the operating organisation/CAMO and the MAA-NLD. In case of doubt concerning such a decision of the operating organisation/ CAMO, the AMO should inform its MAA-NLD on such doubt, before issuing the CRS. This should allow the MAA-NLD to investigate the matter as appropriate.

3. The procedure should draw attention to the fact that NLD-MAR-145.A.50(a) does not normally permit the issue of a 'CRS for aircraft' in the case of non-compliance and should state what action the mechanic, supervisor and certifying staff should take to bring the matter to the attention of the relevant department or person responsible for technical co-ordination with the operating organisation/CAMO so that the issue may be discussed and resolved. In addition, the appropriate person(s) as specified in NLD-MAR-145.A.30(b) should be kept informed in writing of such possible non-compliance situations and this should be included in the procedure.

AMC 145.A.50(f) Certification of maintenance

1. 'Appropriate release certificate' means a certificate which clearly states that the aircraft component is serviceable and clearly specifies the AMO releasing this component together with details of the authority under whose approval the AMO works including the approval or authorisation reference.
2. 'Compliance with all other technical and operational requirements' means making an appropriate entry in the aircraft technical log, checking for compliance with type design standards, modifications, repairs, ADs, life limitations and condition of the aircraft component plus information on where, when and why the aircraft was grounded.

GM 145.A.55(a) Maintenance records

1. Properly executed and retained records provide CAMOs and maintenance personnel with information essential in controlling unscheduled and scheduled maintenance, and trouble-shooting to eliminate the need for re-inspection and rework to establish airworthiness.

The prime objective is to have secure and easily retrievable records with comprehensive and legible contents. The aircraft record should contain basic details of all serialised aircraft components and all other significant aircraft components installed, to ensure traceability to such installed aircraft component documentation and associated maintenance data as specified in NLD-MAR-145.A.45.

2. Some gas turbine engines are assembled from modules and a true total time in service for a total engine is not kept. When operating organisation/CAMOs wish to take advantage of the modular design, then total time in service and maintenance records for each module are to be maintained. The maintenance records as specified are to be kept with the module and should show compliance with any mandatory requirements pertaining to that module.

3. Reconstruction of lost or destroyed records can be done by reference to other records which reflect the time in service, research of records maintained by repair facilities and reference to records maintained by individual mechanics etc. When these things have been done and the record is still incomplete, the operating organisation/CAMO may make a statement in the new record describing the loss and establishing the time in service based on the research and the best estimate of time in service. The reconstructed records should be submitted to the MAA-NLD for acceptance.

Note: Additional maintenance may be required.

4. The maintenance record can be either a paper or computer system or any combination of both.

5. Paper systems should use robust material which can withstand normal handling and filing. The record should remain legible throughout the required retention period.

6. Computer systems may be used to control maintenance and/or record details of maintenance work carried out. Computer systems used for maintenance should have at least one backup system which should be updated at least within 24 hours of any

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maintenance. Each terminal is required to contain programme safeguards against the ability of unauthorised personnel to alter the database.

Note: An AMO's responsibility for recording all details of the maintenance work carried out ends with the completion of the CRS. It is the operating organisation/CAMO's responsibility to enter the information given in the CRS into the aircraft continuing airworthiness record system.

AMC 145.A.55(c) Maintenance records

Associated maintenance data is specific information such as repair and modification data. This does not necessarily require the retention of all Aircraft Maintenance Manual, Component Maintenance Manual, Illustrated Parts Catalogue etc. issued by the (Military) TC/ STC holder. Maintenance records should refer to the revision status of the data used.

AMC 145.A.65(a) Quality policy, maintenance procedures and quality system

The quality policy should as a minimum include a statement committing the maintenance organisation to:

- Recognise quality as a prime consideration at all times;
- Apply Human factors principles;
- Encourage personnel to report maintenance related errors/incidents;
- Recognise that compliance with procedures, quality standards and regulations is the duty of all personnel;
- Recognise the need for all personnel to cooperate with the quality auditors.

AMC 145.A.65(b) Quality policy, maintenance procedures and quality system

1. Maintenance procedures should be held current such that they reflect best practice within the maintenance organisation. It is the responsibility of all the maintenance organisation's personnel to report any differences via their maintenance organisation's internal occurrence reporting mechanisms.

2. All procedures, and changes to those procedures, should be verified and validated before use where practicable.

3. All technical procedures should be designed and presented in accordance with good human factors principles.

AMC 145.A.65(b)(2) Quality policy, maintenance procedures and quality system

Specialised services include any specialised activity, such as but not limited to non-destructive testing requiring particular skills and/or qualification. NLD-MAR-145.A.30(f) covers the qualification of personnel but, in addition, maintenance procedures should be established that cover the control of any specialised process.

AMC 145.A.65(b)(3) Quality policy, maintenance procedures and quality system

1. See NLD-MAR GM 145.A.65(b)(3)

2. Procedures should be established to detect and rectify maintenance errors that could, as minimum, result in a failure, malfunction, or defect endangering the safe operation of the aircraft if not performed properly ('Safety-Critical' tasks). These procedures should identify the method for capturing errors, and the maintenance tasks or processes concerned. In order to determine the work items to be considered, the following maintenance tasks should primarily be reviewed to assess their impact on safety:

- Installation, rigging and adjustments of flight controls;
- Installation of aircraft engines, propellers and rotors;
- Overhaul, calibration or rigging of components such as engines, propellers, transmissions and gearboxes;
- installation and maintenance carried out on ejection seats

but additional information should also be processed, such as:

- Previous experiences of maintenance errors, depending on the consequence of the failure;
- Information arising from the 'occurrence reporting system' required by NLD-MAR-145.A.60;
- MAA-NLD requirements for error capturing, if applicable.

3. In order to prevent omissions, every maintenance task or group of tasks should be signed-off. To ensure the task or group of tasks is completed, it should only be signed-off after completion. Work by unauthorised personnel (i.e. temporary staff, trainee,..) should be checked by authorised personnel before they sign-off. The grouping of tasks for the purpose of signing-off should allow critical steps to be clearly identified.

Note: A "sign-off" is a statement by the competent person performing or supervising the work, that the task or group of tasks has been correctly performed. A sign-off relates to one step in the maintenance process and is therefore different to the release to service of the aircraft maintenance. "Authorised personnel" means personnel formally authorised by the maintenance organisation to sign-off tasks. "Authorised personnel" are not necessarily "certifying staff".

4. The maintenance organisation should ensure that when carrying out a modification, repair or maintenance, CDCCL (if applicable) are not compromised; this should require the development of appropriate procedures where necessary by the maintenance organisation. The maintenance organisation should pay particular attention to possible adverse effects of any wiring change to the aircraft, even a change not specifically associated with the fuel tank system. For example, it should be common practice to identify segregation of fuel gauging system wiring as a CDCCL (if applicable). Maintenance

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organisations can prevent adverse effects associated with wiring changes by standardising maintenance practices through training, rather than by periodic inspection. Training should be provided to prevent indiscriminate routing and splicing of wires and to provide comprehensive knowledge of critical design features of fuel tank systems that would be controlled by a CDCCL (if applicable). AMC is provided for training to maintenance organisation personnel in Appendix IV to AMC NLD-MAR-145.A.30(e) and AMC NLD-MAR-145.B.10(c).

GM 145.A.65(b)(3) Quality policy, maintenance procedures and quality system

1. Critical Tasks might not jeopardise safety on their own, but there could be a cumulative effect if the same maintainer reproduces the same error when he does the same tasks on several systems. The purpose of this procedure is therefore to minimise the rare possibility of an error being repeated whereby the identical aircraft components are not reassembled thereby compromising more than one system. One example is the remote possibility of failure to reinstall engine gearbox access covers or oil filler caps on all engines of a multi-engined aircraft resulting in major oil loss from all engines. Another example is the case of removal and refitting of multiple oil filler caps on one aircraft/engine or component, which could require a re-inspection of all oil filler caps on that particular aircraft/engine or component after the last oil filler cap has supposedly been refitted.

2. The maintenance of ignition prevention features is necessary for the inherent safety and reliability of an aircraft's fuel tank system. The aircraft cannot be operated indefinitely with the failure of an ignition prevention feature. The failure will have a direct adverse effect on operational safety. It could prevent the continued safe flight and landing of the aircraft or cause serious or fatal injury to the occupants. The fuel system review required will identify ignition prevention features of the design. The failure of any of these features may not immediately result in an unsafe condition, but it may warrant certain maintenance to support continued airworthiness.

AMC 145.A.65(c)(1) Quality policy, maintenance procedures and quality system.

1. The primary objectives of the quality system are to enable the maintenance organisation to ensure that it can deliver a safe product and that the maintenance organisation remains in compliance with the requirements.

2. An essential element of the quality system is the independent audit.

3. The independent audit is an objective process of routine sample checks of all aspects of the maintenance organisation's ability to carry out all maintenance to the required standards and includes some product sampling as this is the end result of the maintenance process. It represents an objective overview of the complete maintenance related activities and is intended to complement the NLD-MAR-145.A.50(a) requirement for certifying staff to be satisfied that all required maintenance has been properly carried out before issue of the CRS for aircraft and components. Independent audits should include a percentage of random audits carried out on a sample basis when maintenance is being carried out. This means some audits during the night for those maintenance organisations that work at night, and some audits while in an operational environment (if appropriate).

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4. Except as specified in subparagraph 9, the independent audit should ensure that all aspects of NLD-MAR-145 compliance are checked every 12 months and may be carried out as a complete single exercise or subdivided over the 12 month period in accordance with a scheduled plan. The independent audit does not require each procedure to be checked against each product line when it can be shown that the particular procedure is common to more than one product line and the procedure has been checked every 12 months without resultant findings. Where findings have been identified, the particular procedure should be rechecked against other product lines until the findings have been rectified after which the independent audit procedure may revert back to 12 monthly for the particular procedure.

5. The independent audit should sample check one product on each product line every 12 months as a demonstration of the effectiveness of maintenance procedures compliance. It is recommended that procedures and product audits be combined by selecting a specific product example, such as an aircraft or engine or instrument and sample checking all the procedures and requirements associated with the specific product example to ensure that the end result should be an airworthy product.

a. For the purpose of the independent audit, a product line includes any product under an NLD-MAR-145 Appendix II approval class rating as specified in the approval schedule issued to the particular AMO.

b. It therefore follows for example that a maintenance organisation with a capability to maintain aircraft, repair engines, brakes and autopilots would need to carry out four complete audit sample checks each year except as specified otherwise in subparagraphs 5 or 9.

6. The sample check of a product means to witness any relevant testing and visually inspect the product and associated documentation. The sample check should not involve repeat disassembly or testing unless the sample check identifies findings requiring such action.

7. NOT APPLICABLE

8. Except as specified otherwise in subparagraph 9, where the maintenance organisation has line stations (such as but not limited to “out of area” locations, embarked operations if appropriate) listed as per NLD-MAR-145.A.75(d) the quality system should describe how these are integrated into the system and include a plan to audit each listed line station at a frequency consistent with the extent of flight and maintenance activity at the particular line station. Except as specified otherwise in subparagraph 9 the maximum period between audits of a particular line station should not exceed 24 months.

9. Except as specified otherwise in subparagraph 5, the MAA-NLD may agree to increase any of the audit time periods specified in AMC NLD-MAR-145.A.65(c)(1) by up to 100% provided that there are no safety related findings and subject to being satisfied that the maintenance organisation has a good record of rectifying findings in a timely manner.

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10. A report should be raised each time an audit is carried out describing what was checked and the resulting findings against applicable requirements, procedures and products.

- i. A level 1 finding is any significant non-compliance with NLD-MAR-145 requirements which lowers the safety standard and hazards seriously the flight safety.
For level 1 findings, immediate action shall be taken by the AMO to limit or suspend maintenance activities in whole or in part, depending upon the extent of the level 1 finding, until successful corrective action has been taken.
- ii. A level 2 finding is any non-compliance with the NLD-MAR-145 requirements which could lower the safety standard and possibly hazards the flight safety.

For level 2 findings, the corrective action period determined by the AMO must be appropriate to the nature of the finding, but in any case initially must not be more than three months. In certain circumstances and subject to the nature of the finding the AMO may extend the three month period subject to a satisfactory corrective action plan agreed by the Accountable Manager.
- iii. After determination of findings, the AMO shall:
 1. Identify the root cause of the non-compliance; and
 2. Define a corrective action plan; and
 3. Demonstrate corrective action implementation to the satisfaction of the Quality Manager within the applicable period.

11. The independence of the audit should be established by always ensuring that audits are carried out by personnel not responsible for the function, procedure or products being checked.

It therefore follows that a large maintenance organisation, being a maintenance organisation with more than about 500 maintenance staff should have a dedicated quality audit group whose sole function is to conduct audits, raise finding reports and follow up to check that findings are being rectified.

For the medium sized maintenance organisation, being a maintenance organisation with less than about 500 maintenance staff, it is acceptable to use competent personnel from one section/department not responsible for the maintenance function, procedure or product to audit the section/department that is responsible subject to the overall planning and implementation being under the control of the quality manager.

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Maintenance organisations with a maximum of 10 maintenance staff actively engaged in carrying out maintenance may contract or delegate the independent audit element of the quality system to another organisation or a qualified and competent person, in both cases approved by the MAA-NLD.

GM 145.A.65(c)(1) Quality policy, maintenance procedures and quality system

1. The purpose of this GM is to give guidance on just one acceptable working audit plan to meet part of the needs of NLD-MAR-145.A.65(c)1. There is any number of other acceptable working audit plans.

2. The proposed plan lists the subject matter that should be covered by the audit and attempts to indicate applicability in the various types of workshops and aircraft facilities. The list should therefore be tailored for the particular situation and more than one list may be necessary. Each list should be shown against a timetable to indicate when the particular item is scheduled for audit and when the audit was completed.

| PARA | Comment | HANGAR | ENGINE Workshop | MECH Workshop | AVIONIC Workshop |
|-------------|----------------|---------------|------------------------|----------------------|-------------------------|
| 145.A.25 | | Yes | Yes | Yes | Yes |
| 145.A.30 | | Yes | Yes | Yes | Yes |
| 145.A.35 | | Yes | Yes | Yes | Yes |
| 145.A.40 | | Yes | Yes | Yes | Yes |
| 145.A.42 | | Yes | Yes | Yes | Yes |
| 145.A.45 | | Yes | Yes | Yes | Yes |
| 145.A.47 | | Yes | Yes | Yes | Yes |
| 145.A.48 | | Yes | Yes | Yes | Yes |
| 145.A.50 | | Yes | Yes | Yes | Yes |
| 145.A.55 | | Yes | Yes | Yes | Yes |
| 145.A.60 | | Yes | Yes | Yes | Yes |
| 145.A.65 | | Yes | Yes | Yes | Yes |
| 2.1 | MOE | Yes | Yes | Yes | Yes |
| 2.2 | MOE | Yes | Yes | Yes | Yes |
| 2.3 | MOE | Yes | Yes | Yes | Yes |
| 2.4 | MOE | Yes | Yes | Yes | Yes |
| 2.5 | MOE | Yes | Yes | Yes | Yes |
| 2.6 | MOE | Yes | Yes | Yes | Yes |
| 2.7 | MOE | Yes | Yes | Yes | Yes |
| 2.8 | MOE | Yes | Yes | Yes | Yes |
| 2.9 | MOE | Yes | Yes | Yes | Yes |
| 2.10 | MOE | Yes | No | No | No |
| 2.11 | MOE | Yes | Yes | Yes | Yes |
| 2.12 | MOE | Yes | Yes | Yes | Yes |
| 2.13 | MOE | Yes | Yes | Yes | Yes |
| 2.14 | MOE | Yes | Yes | Yes | Yes |
| 2.15 | MOE | Yes | No | No | No |
| 2.16 | MOE | Yes | Yes | Yes | Yes |
| 2.17 | MOE | if appl | if appl | if appl | if appl |
| 2.18 | MOE | Yes | Yes | Yes | Yes |

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| | | | | | |
|----------|-----|---------|---------|---------|---------|
| 2.19 | MOE | Yes | Yes | Yes | Yes |
| 2.20 | MOE | Yes | Yes | Yes | Yes |
| 2.21 | MOE | if appl | if appl | if appl | if appl |
| 2.22 | MOE | Yes | Yes | No | No |
| 2.23 | MOE | Yes | No | No | No |
| 2.24 | MOE | Yes | Yes | Yes | Yes |
| 2.25 | MOE | Yes | Yes | Yes | Yes |
| 2.26 | MOE | Yes | Yes | Yes | Yes |
| 2.27 | MOE | Yes | Yes | Yes | Yes |
| 2.28 | MOE | Yes | Yes | Yes | Yes |
| L2.1 | MOE | if appl | No | No | No |
| L2.2 | MOE | if appl | No | No | No |
| L2.3 | MOE | if appl | No | No | No |
| L2.4 | MOE | if appl | No | No | No |
| L2.5 | MOE | if appl | No | No | No |
| L2.6 | MOE | if appl | No | No | No |
| L2.7 | MOE | if appl | No | No | No |
| 3.9 | MOE | if appl | if appl | if appl | if appl |
| 3.10 | MOE | if appl | if appl | if appl | if appl |
| 3.11 | MOE | if appl | if appl | if appl | if appl |
| 3.12 | MOE | Yes | Yes | No | No |
| 3.13 | MOE | Yes | Yes | Yes | Yes |
| 3.14 | MOE | Yes | Yes | Yes | Yes |
| 3.15 | MOE | if appl | if appl | if appl | if appl |
| 3.16 | MOE | if appl | if appl | if appl | if appl |
| 3.17 | MOE | Yes | Yes | Yes | Yes |
| 3.18 | MOE | Yes | Yes | Yes | Yes |
| 3.19 | MOE | Yes | Yes | Yes | Yes |
| 3.20 | MOE | Yes | Yes | Yes | Yes |
| 3.21 | MOE | Yes | Yes | Yes | Yes |
| 3.22 | MOE | Yes | Yes | Yes | Yes |
| 3.23 | MOE | Yes | Yes | Yes | Yes |
| 3.24 | MOE | Yes | Yes | Yes | Yes |
| 145.A.67 | | Yes | Yes | Yes | Yes |
| 145.A.70 | | Yes | Yes | Yes | Yes |
| 145.A.75 | | Yes | Yes | Yes | Yes |
| 145.A.80 | | Yes | Yes | Yes | Yes |
| 145.A.85 | | Yes | Yes | Yes | Yes |
| 145.A.95 | | if appl | if appl | if appl | if appl |

Note 1: 'if appl' means if applicable or relevant.

Note 2: In the line station case all line stations should be audited at the frequency agreed with the MAA-NLD within the limits of AMC NLD-MAR-145.A.65(c)(1).

AMC 145.A.65(c)(2) Quality policy, maintenance procedures and quality system

1. An essential element of the quality system is the quality feedback system.
2. The quality feedback system should not be contracted to outside persons. The principal function of the quality feedback system is to ensure that all findings resulting from the independent quality audits of the maintenance organisation are properly investigated and corrected in a timely manner and to enable the Accountable Manager to be kept informed of any safety issues and the extent of compliance with NLD-MAR-145.
3. The independent quality audit reports referenced in AMC NLD-MAR-145.A.65(c)(1) subparagraph 10 should be sent to the relevant department(s) for rectification action giving target rectification dates. Rectification dates should be discussed with such department(s) before the quality department or nominated quality auditor confirms such dates in the report. The relevant department(s) are required by NLD-MAR-145.A.65(c)(2) to rectify findings and inform the quality department or nominated quality auditor of such rectification.
4. The Accountable Manager should hold regular meetings with staff to check progress on rectification except that in the large maintenance organisations such meetings may be delegated on a day to day basis to the quality manager subject to the Accountable Manager meeting at least twice per year with the senior staff involved to review the overall performance and receiving at least a half yearly summary report on findings of noncompliance.
5. All records pertaining to the independent quality audit and the quality feedback system should be retained for at least 2 years after the date of clearance of the finding(s) to which they refer or for such periods as to support changes to the AMC NLD-MAR-145.A.65(c)(1) subparagraph 9 audit time periods, whichever is the longer.

GM 145.A.67(a) Safety Management System (SMS)

1. It is difficult to employ a standard compliance audit process in the assessment of SMS effectiveness. Variations in the size, nature and complexity of organisations make it necessary to assess organisations on the 'performance' of their SMS rather than 'compliance' and 'conformance'. These performance assessments primarily focus on the effectiveness of the SMS and its maturity growth. See more information about SMS in Appendix V to GM 145.A.67(a) Safety Management System introduction.
2. Assessment against the indicators, contained within the AMC, will be used to determine the maturity of the organisation. Following an assessment, an agreed maturity growth will be established for the organisation by the MAA-NLD. For new organisations, full SMS maturity is expected after a period of 5-7 years depending on the size, nature and complexity of the organisation.

AMC 145.A.67(b)1 and c Safety Management Systems (SMS)

Safety policy and objectives. The organisation's safety policy and safety objectives convey its expectations, objectives, commitments, and accountabilities to its employees and the MAA-NLD. The safety policy and objectives component of an SMS had to include the following:

(a) **Management commitment and responsibility.** The organisation has defined its safety policy and safety management structure and can demonstrate the following:

(i) The safety policy statement (see for an example Appendix VI to AMC 145.A.67(b)1 Safety Policy and Objectives) is signed by the Accountable Manager and includes:

- a commitment towards aviation safety;
- a commitment to all defence aviation regulatory requirements;
- a commitment to provide appropriate resources for safety management;
- a commitment to continuous improvement in the organisation's safety levels;
- a commitment to the ongoing development of the organisation's SMS;
- the organisation's safety objectives;
- active encouragement of safety reporting.

(ii) The Accountable Manager and key safety management personnel promote and demonstrate their commitment to their safety policy through active and visible participation in the SMS, and by ensuring that this system is based on their safety policy.

(iii) The safety policy is reviewed periodically to ensure it remains current.

(iv) A disciplinary policy has been defined that clearly identifies the conditions under which punitive action would be considered, e.g. illegal activity, negligence or wilful misconduct, and is used by the organisation.

(v) There is evidence of decision making, actions and behaviours that reflect a positive safety culture.

(b) **Safety Accountabilities.** The organisation has developed an organisational safety structure and can demonstrate the following:

(i) The Accountable Manager has been appointed with full responsibility and ultimate accountability for the SMS to ensure it is properly implemented and performing effectively, and has control of the financial and human resources required for the proper implementation of an effective SMS. The Accountable Manager is fully aware of their SMS roles and responsibilities in respect of the safety policy, safety standards and safety culture growth required in the organisation.

(ii) Safety accountabilities, authorities, roles and responsibilities are defined and documented throughout the organisation and safety management is shared across the organisation.

(c) **Key safety personnel.** The organisation has appointed key safety personnel and can demonstrate the following:

(i) A competent person with the appropriate knowledge, skills and experience has been nominated to manage the operation of the SMS, and fulfils the required job functions and responsibilities.

(ii) There is a direct reporting line between the Safety Manager and the Accountable Manager, and the Accountable Manager and other key safety personnel are made aware of agreed safety information.

(iii) The organisation has allocated sufficient resources to manage the SMS including manpower for safety investigation, analysis, auditing and promotion, and personnel in key safety roles are kept trained / current.

(d) **Coordination of emergency response planning.** The organisation has considered the coordination and planning of its emergency responses and can demonstrate the following:

(i) An emergency response plan, if required, that reflects the size, nature and complexity of the operation has been developed, defining the procedures, roles, responsibilities and actions of the various organisation's and key personnel, and is periodically tested.

(ii) The organisation has a process to inform all personnel of the emergency response plan requirements, and all personnel are aware of their responsibilities.

(e) **SMS documentation.** The organisation has established its SMS documentation and can demonstrate the following:

(i) There is documentation that describes the SMS and the interrelationships between all of its elements, and it is readily available to all personnel.

(ii) SMS documentation is regularly reviewed and updated with appropriate version control in place.

(iii) The SMS documentation describes the means for the storage of SMS related records.

GM 145.A.67(b)1 Safety Management System (SMS)

1. **Safety policy and objectives** covers the following elements:

- a. Management commitment and responsibility
- b. Safety accountabilities
- c. Appointment of key safety personnel
- d. Emergency response planning

e. SMS documentation.

2. Safety policy and objectives is a supporting component of an SMS, outlining what the organisation intends to do to manage safety. For organisations that are new to SMS, safety policy and objectives starts with a Gap Analysis and Implementation Plan, which is discussed in greater detail in Appendix V to GM 145.A.67(a) - Safety Management System introduction.

MANAGEMENT COMMITMENT AND RESPONSIBILITY

3. The organisation is to nominate a member to be accountable to the MAA-NLD, who shall be referred to as the Accountable Manager. The Accountable Manager has overall responsibility for running the organisation. The Accountable Manager may hold the position for more than one organisation and is not required to be necessarily knowledgeable on technical or operational matters. While the Accountable Manager remains accountable, the safety responsibilities of each individual in the organisation are to be clearly defined through the organisation's safety documentation.

4. With regard to the Accountable Manager, it is normally intended to mean the Chief Executive Officer or senior military commander of the maintenance organisation, who by virtue of position has overall (including in particular resource allocation) responsibility for running the maintenance organisation. The Accountable Manager may be the Accountable Manager for more than one organisation and is not required to be necessarily knowledgeable on technical matters as the MOE defines the maintenance standards. When the Accountable Manager is not the Chief Executive Officer or senior military commander, the MAA-NLD will need to be assured that such an Accountable Manager has direct access to the Chief Executive Officer or senior military commander and has a sufficiency of 'maintenance resources' allocation.

5. The safety accountabilities of the Accountable Manager include ensuring:

- a. Commitment the organisation's personnel to their individual and collective safety responsibilities.
- b. Provision of the resources necessary for effective safety management.
- c. Promotion of awareness of the organisation's SMS at all levels of the organisation.
- d. Promotion and demonstration of commitment to the safety policy through their active and visible participation in SMS processes.
- e. There are defined standards for acceptable safety behaviour.
- f. Active encouragement of safety reporting, with explicit support of a 'just and fair culture' as part of the overall safety culture of the organisation.
- g. An appropriate process by which safety culture can be measured and improvements planned.
- h. Periodic reviews are conducted of the safety policy to ensure it remains relevant and appropriate to the organisation.
- i. Commitment to continuous improvement of SMS performance.

6. The Accountable Manager should develop a succinct safety policy statement (see for an example Appendix VI to AMC 145.A.67(b)1) that demonstrates genuine management commitment to, and responsibility for, the SMS. This should reflect the organisation's philosophy of safety management and become the foundation on which the organisation's SMS is built. The creation of a positive safety culture begins with the issuance of clear, unequivocal direction, an indication of the types of behaviours that are unacceptable, and the conditions under which administrative action would not apply.

7. The safety policy statement should also be accompanied or contain a list of the organisation's safety objectives, defining what the organization aims to accomplish with its SMS. Safety objectives chosen should be designed to encompass all functions of the SMS to ensure a balanced approach to improvement and monitoring. Noting that not all objectives will be written in a SMART format (specific, measureable, achievable, realistic and timely) it is expected that they should be supported by SMART safety targets to demonstrate progress towards the objective. Further details regarding safety targets can be found in GM 145.A.67(b)3.

8. In preparing a safety policy, the Accountable Manager should consult widely with key staff members in charge of key safety areas. Consultation ensures that the document is relevant to staff and gives them a sense of ownership in it.

SAFETY ACCOUNTABILITIES

9. While the Accountable Manager remains accountable for the organisation's SMS to the MAA-NLD, all of the organisation's management and personnel should have responsibilities related to the SMS. These responsibilities should be clearly communicated and known throughout the organisation.

10. To assist with communication of responsibilities, senior management should develop and resource an organisational structure that is capable of supporting the agreed SMS functions. It should clearly depict responsibilities, accountabilities (of the Accountable Manager), lines of communication for safety issues and recognise the commitment to the safety contributions required by all staff.

APPOINTMENT OF KEY SAFETY PERSONNEL

11. The appointment of key safety personnel is vital to the effective functioning of an SMS. The number, type, skills, composition and appointment approach of these members will differ greatly depending on the size, nature and complexity of the business undertaken, for example:

a. **Large or complex organisations.** Large organisations could be expected to have a dedicated safety department, led by dedicated Safety Manager whose duties may encompass SMS management. There would be scope within the department to appoint deputies and additional staff as required.

NOTE: The Safety Manager may be identified by different titles in different organisations.

b. **Medium-sized organisations.** A medium-sized organisation could be expected to have a dedicated Safety Manager who might also hold responsibilities within other contributing management systems, and possibly some dedicated safety employees. There would be scope for deputies to be appointed when required.

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c. **Small or non-complex organisations.** Small organisations could be expected to allocate responsibilities of the Safety Manager to one or more of its employees as a secondary duty, given the organisation's limited SMS complexity.

12. Key safety positions and roles within the organisation may include:

- a. the Accountable Manager
- b. the Safety Manager
- c. strategic-level safety committee members
- d. tactical-level safety committee members
- e. emergency response coordinators
- f. safety investigators
- g. safety training facilitators
- h. assorted safety-related deputies and teams.

13. **Safety Manager.** Each SMS will have a nominated Safety Manager who is responsible for the development and maintenance of an effective SMS. The Safety Manager advises the Accountable Manager and other management personnel on aviation safety management matters and may be supported by additional staff. The Safety Manager's functions may include, but are not necessarily limited to:

- a. Managing the SMS implementation plan on behalf of the Accountable Manager.
- b. Performing/facilitating hazard identification and safety risk analysis.
- c. Monitoring corrective actions and evaluating their results.
- d. Providing periodic reports on the organisation's safety performance.
- e. Maintaining SMS documentation and records.
- f. Planning and facilitating SMS training for staff.
- g. Providing independent advice on safety matters.
- h. Monitoring safety concerns in the aviation industry and their perceived impact on the organisation's operations.
- i. Coordinating and communicating (on behalf of the Accountable Manager) with the MAA-NLD and other relevant agencies as necessary on issues relating to aviation safety and SMS.
- j. Coordinating and communicating (on behalf of the Accountable Manager) with international organisations on issues relating to aviation safety and SMS.

14. Specific selection criteria for the competence of Safety Manager are given in AMC 145.A.30(e).

15. **Safety Committees.** Other key safety personnel include members of safety committees. The size, structure and objectives of safety committees will vary depending on the organisation, but should include a combination of strategic and tactical activities/discussions. Strategic activities/discussions deal with high-level issues related to policies, resource allocation and safety performance monitoring. Tactical activities/discussions deal with specific implementation issues, generally associated with decisions made at the strategic level.

COORDINATION OF THE EMERGENCY RESPONSE PLAN

16. An effective SMS should contain an Emergency Response Plan (ERP) to ensure appropriate action is taken in the event of aviation safety related emergencies. The requirements of the ERP will vary depending on the organisation. Operators and maintenance organisations will likely need to include emergency responses to in-flight incidents and accidents, whilst small component maintainers and providers will likely focus more on the quarantine of components/documentation following an aviation incident or an in-facility emergency. An effective ERP should contain the following:

- a. Instructions to ensure that there is an orderly and efficient transition from normal to emergency operations.
- b. A variety of defined foreseeable occurrences and associated actions to be taken.
- c. Plans and coordinated actions to ensure the risks attributable to a major safety event can be managed and minimised.
- d. A clear guide for the assignment of authority and responsibilities in the event of an emergency.
- e. The authorisations for action by key personnel.
- f. The means to coordinate emergency efforts internally and with those organisations it should interface with during the provision of its services.
- g. Descriptions of periodic testing and review requirements.
- h. The definition and management of appropriate initial and recurrent training for personnel assigned to emergency roles.
- i. The required coordination of efforts to cope with the emergency.
- j. Instructions to assist in the return to normal operations as soon as possible.

17. Organisations do not need to develop a new ERP if their defined emergency operations are already covered by a suitable plan. They may leverage off a corporate ERP, or a site ERP, provided they identify the interfaces to that plan, their responsibilities within it, and what circumstances would cause it to be activated.

SAFETY MANAGEMENT SYSTEM DOCUMENTATION

18. Formal SMS documentation describes the organisation's SMS and helps to communicate it internally to staff, and externally to interfacing organisations. Documentation provides the authoritative basis for the establishment, and improvement of, the organisation's level of safety. Some organisations may elect to use an SMS manual (or equivalent) as a focal point for their SMS documentation, however this is not a requirement. Typically the detail and extent of SMS documentation should be tailored to the organisation's size, scope, complexity and risk context. It is important that SMS documentation captures all four SMS components along with associated procedures, policies and activities, and be integrated for effectiveness and efficiency. Ideally SMS documentation should be effective enough to clarify how the organisation's safety management activities link to the organisation's safety policy.

19. SMS documentation is to contain appropriate interrelationships between the components of the SMS and should be made readily available to all personnel that may need to use or seek to read the documentation. All documentation should be reviewed regularly to capture any changes or improvements, and contain appropriate version control to track any changes that are made.

20. All SMS documents and records should be uniquely identified and stored in a consistent and logical manner.

21. Initially the SMS documentation may need to be structured as an SMS Implementation Plan, with intended scope, tasks required and phases (example Appendix VII to GM 145.A.67(b)1 Phased SMS implementation). Over time, as SMS processes are embedded and become functional within the organisation, the Implementation Plan could transition naturally to become the full suite of SMS documentation.

AMC 145.A.67(b)2 and (d) Safety Management System (SMS)

Safety risk management. The organisation's safety risk management system will enable development of structured processes to understand the critical characteristics of its systems and environment and apply this knowledge to identify aviation safety hazards, analyse and assess risk and develop risk controls (using the hierarchy of controls) and had to be include the following:

(a) Hazard Identification. The organisation will develop and maintain a process that ensures that aviation safety hazards in the aviation environment are identified. Aviation safety hazards will be identified from the analysis of critical design and performance factors, processes, and aviation activities in sufficient detail to determine associated level of risk and risk acceptability and can demonstrate the following:

(i) The aviation safety hazard identification process shall include reactive safety data collection and be a part of the formal means of collecting, recording, acting on aviation safety hazards.

(ii) The aviation safety hazard identification process shall include proactive safety data collection and shall be a part of the formal means of collecting, recording, acting on aviation safety hazards.

(iii) The aviation safety hazard identification process shall include predictive safety data collection and shall be a part of the formal means of collecting, recording, acting on aviation safety hazards.

(iv) Aviation safety hazards are periodically reviewed.

(b) Safety risk assessment and mitigation. The organisation will develop and maintain a process that ensures analysis, assessment, and control of the safety risks in aviation system activities and can demonstrate the following:

(i) There is a structured process for the assessment of risk that includes identified aviation safety hazards, expressed in terms of severity (consequence) and probability (likelihood).

(ii) The organisation uses a documented process that applies the hierarchy of controls to eliminate or otherwise minimise So Far As is Reasonably Practicable (SFARP) and then implements the required controls.

(iii) Controls resulting from risk assessments, including timelines and allocation of responsibilities are documented and actioned.

(iv) The risk evaluation process includes criteria against which an organisation makes decisions on whether to proceed with an activity after all the practicable controls are implemented.

(v) Risk controls are being verified, monitored and reviewed to confirm they are working and effective.

(vi) Risk management process is routinely applied in decision making processes.

(vii) The Accountable Manager and other key safety management personnel have visibility and are advised of the medium and high-risk aviation safety hazards, including their mitigation and controls.

GM 145.A.67(b)2 Safety Management System (SMS)

1. **Safety risk management** covers the following elements:

- a. Hazard identification
- b. Risk assessment and mitigation.

2. Organisations need to ensure that the risks to aviation safety posed by their aviation activities, and the interface of those aviation activities to other organisational functions, are controlled to meet agreed safety performance targets. This process is known as safety risk management and includes hazard identification, safety risk assessment and the implementation and monitoring of appropriate safety risk controls.

3. Safety risk management is the core component of an SMS and systematically assesses risks that exist within the context of the delivery of an organisation's products or services. Hazards can be identified reactively, proactively or predictively. After which hazards are assessed for related safety risks. A mature SMS caters equally for all three.

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4. At the micro level, hazards may result from product, process or behaviours that are deficient in design, training, function, or human interfaces with other processes or systems (see Appendix V to GM 145.A.67(a)). At the macro level, hazards may also result from latent failures of product, process, or organisational systems to account for human performance nuances, or failures to adequately adapt to changes in the organisation's operating context.

5. To effectively manage aviation risks the organisations SMS, should include:

- a. Hazard identification techniques tailored to suit the specific activity being undertaken.
- b. Risk analysis techniques commensurate with the size, nature and complexity of the organisation.
- c. Selection and prioritisation of risk controls based on the hierarchy of controls.
- d. Procedures for communicating the risk and associated risk controls to relevant stakeholders.
- e. Procedures for documenting hazards, risks and associated risk controls, should as a minimum, detail:
 - the hazard,
 - the likelihood and consequences of the risk,
 - the risk controls that have been implemented,
 - the review period applicable to each risk control,
 - the stakeholder responsible for implementing each risk control.

6. **Human Factors.** Hazards arising from Human Factors (HF) are inherent in any organisation. These hazards should be captured using hazard identification tools such as Bowtie analysis, and through the analysis of incident investigation reports.

7. An SMS should clearly demonstrate how HF has been considered in the management of risk. Of particular relevance is the implementation of controls to address the potential and actual consequences of human error. Typically, control measures for potential and actual human error might focus on HF aspects such as equipment design and usability, task and job design, workplace design, procedures, training, communication, team work, supervision, and monitoring.

8. **Fatigue.** In the aviation context, fatigue is considered a significant hazard. It impairs essential aspects of human performance resulting in increased susceptibility to error and greater risk of injury and accident. An SMS should clearly demonstrate how the organisation manages the risk of fatigue in its personnel/employees. A typical approach includes:

- a. Documenting the specific responsibilities of the organisation and its personnel for managing fatigue.
- b. Incorporating fatigue within risk management practices to support the identification, management, and ongoing review of fatigue related hazards.
- c. Documenting key fatigue risk controls, e.g. duty / rest periods and roster patterns.
- d. Reporting and record keeping of all fatigue related events.

HAZARD IDENTIFICATION

9. Hazard identification forms the basis of safety risk management. Hazards in an organisation can be classified into a number of groups, two of which are aviation safety hazards and personal injury safety hazards. Prior to implementing an SMS required by the NLD-MAR-145, it is important to understand the difference between the two. They give rise to different risks with different consequences, and therefore the management of personal injury safety risks does not indicate appropriate management of aviation safety risks. In the context of an organisation, some hazards can generate an aviation safety risk and/or a personal safety risk, both of which need to be managed.

10. Aviation safety hazards could potentially compromise flight safety, e.g. human factors. Aviation safety hazards have the potential to significantly and adversely affect capability by causing multiple fatalities and major damage to aviation assets, i.e. an aircraft crash.

11. Personal injury safety hazards on the other hand, affect individuals but have limited potential to impact flight safety. Personal safety hazards typically lead to incidents such as slips, trips, falls, hearing damage, manual handling injuries, and radiation burns.

12. Hazards can be identified reactively, proactively and predictively from a range of sources. Obviously the more proactive and predictive hazard identification and control is present, the less we will be bound to continue learning from incidents and accidents. Other possible sources include, but are not limited to:

a. Reactive hazard identification:

- i. mandatory incident reporting
- ii. investigation outcomes.

b. Proactive hazard identification:

- i. voluntary and confidential hazard reporting
- ii. brain-storming using experienced personnel
- iii. development of risk scenarios and controls for all activities
- iv. surveys and audits
- v. in-process task observations
- vi. feedback from training
- vii. maintenance program completion reviews.

c. Predictive hazard identification:

- i. objective performance improvement indicators

- ii. trend analyses of the hazard and incident database
- iii. data mining past records
- iv. information sharing to similar/related organisations.

SAFETY RISK ASSESSMENT AND MITIGATION

13. Safety risk assessment and mitigation follows on from hazard identification as part of the complete safety risk management process. In general, this element requires organisations to manage aviation safety risks in a systematic, rational and concise manner in order to eliminate and to treat risks. Measures to eliminate and mitigate risks also need to be assessed in order to ensure that they do not inadvertently introduce new risks. All records/output from the risk management process are to be made available to the MAA-NLD upon request.

14. Identified hazards, risks and treatments need to be reviewed at regular intervals to ensure extant safety risk management decisions remain effective.

AMC 145.A.67(b)3 and (e) Safety Management System (SMS)

Safety assurance. The organisation's safety assurance system, will verify, monitor and measure the safety performance of the organisation. It will then evaluate the effectiveness of SMS by measuring against established safety objectives and targets. The Safety Assurance component of an SMS had to be include the following:

(a) Safety performance monitoring and measurement. The organisation will develop and maintain a means to verify, monitor and measure the safety performance of the organisation, and to evaluate the effectiveness of safety risks controls and can demonstrate the following:

(i) Safety targets and performance indicators have been defined, promulgated and are being monitored and analysed for trends, forming part of the SMS review.

(ii) Safety targets and performance indicators are reviewed and updated periodically.

(iii) There is an internal safety audit programme that focuses on the safety performance of the organisation and its services.

(iv) The organisation has a reporting system to capture errors, aviation safety hazards and near misses that is simple to use and accessible to all personnel, and has identified all the major aviation safety hazards and assessed the risks related to its current activities.

(v) The safety reporting system provides effective feedback to the reporter of any actions taken (or not taken) and, where appropriate, to the rest of the organisation.

(vi) Safety investigations are carried out and identify underlying causes and potential aviation safety hazards for existing and future operations.

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(vii) Personnel express confidence and trust in the organisation's reporting policy and process and safety reports are continuously raised and acted on in a timely manner.

(viii) Personnel responsible for investigating reports are trained in investigation techniques, and use those techniques in the conduct of their investigations.

(ix) Investigations establish causal/contributing factors (why it happened, not just what happened), and use the results as a source for aviation safety hazard identification in the system.

(x) Information obtained from safety assurance and compliance monitoring activities feeds back into the safety risk management process.

(b) Management of change. The organisation will develop and maintain a process to identify changes within the organisation's working environment which may affect established processes and services. This process will be used to describe the arrangements to assure safety performance before implementing changes and can demonstrate the following:

(i) The organisation has established a process and conducts formal hazard analyses and risk assessments for major operational changes, major organisational changes and changes in key personnel.

(ii) Key stakeholders are identified and involved in the change management process.

(iii) The change management process requires previous risk assessments and existing hazards are reviewed for possible effect.

(c) Continuous improvement of the SMS. The organisation will develop and maintain a process to identify the causes of substandard safety performance, determine the implications of substandard safety performance, and eliminate or mitigate such causes and should include the following continuous improvement processes and can demonstrate the following:

(i) A safety committee has been established and has necessary authority to make decisions related to the improvement and effectiveness of the SMS.

(ii) The SMS is periodically reviewed such that improvements in safety performance can be demonstrated.

GM 145.A.67(b)3 Safety Management System (SMS)

1. **Safety assurance** component covers the following elements:

- a. Safety performance monitoring and measurement,
- b. Management of change,
- c. Continuous improvement.

2. Safety assurance processes systematically provides stakeholders with an indication of the performance of the system. Organisations need to continually monitor their internal processes as well as their environment to detect changes or deviations that may introduce emerging safety risks, or degrade the effectiveness and efficiency of existing treatments. In addition to internal monitoring, organisations need to incorporate findings from external audits/assessments. External assurance and evaluation functions provide an element of independence to complement the internal program. Changes or deviations identified can then be addressed through the organisation's safety risk management process and corrective actions raised against findings.

SAFETY PERFORMANCE MONITORING AND MEASUREMENT

3. Targets should be established to achieve each safety objective (safety objectives are discussed in greater detail in GM 145.A.67(b)1. Ideally the targets should be: Specific, Measurable, Achievable, Realistic and Time-based (SMART). To monitor how the organisation is achieving its targets and objectives, associated Safety Performance Indicators (SPI) should be developed.

4. Safety performance monitoring and measurement requires organisations to develop a balanced series of leading and lagging SPIs to quantitatively and qualitatively measure the effectiveness of each of their SMS elements and their intended outcomes. The number of SPIs is not as important as their coverage of the SMS components. Used effectively, SPIs can both provide an early warning of failures to maintain agreed performance or requirements, and confirmation that agreed improvements have been achieved. The selection and use of SPIs should be based on the size, nature and complexity of the organisation.

5. Potential information sources for safety performance monitoring and measurement include, but is not limited to;

- a. safety studies
- b. safety audits
- c. safety reviews
- d. safety surveys
- e. proactive and predictive hazard reports
- f. safety culture survey results
- g. aviation safety occurrences
- h. safety investigations
- i. training registers and feedback
- j. risk assessments
- k. hazard and risk registers
- l. safety days/briefs

m. safety improvement suggestions

n. safety meeting participation.

6. Frequency of monitoring. Many organisations may rely solely on audits to highlight system deterioration. However, audit intervals can be too infrequent, or may not provide an ability to collect data on all SPIs. Instead, the use of SPIs should be seen as complementing audit programs. Deficiencies uncovered by either an audit or SPI may highlight the need for a new SPI or audit item to be added. Inevitably, just like audit frequencies, some SPIs may have long lead or lag times. It is therefore important to establish balanced sets of SPIs that can be regularly reviewed in short, medium and long timeframes. Most importantly, each SPI needs to be defined so as to be clear as to what is being displayed, and what safety actions need to be taken as a result.

7. Reporting culture. In order to be effective, the organisation needs to establish and maintain an environment in which employees feel comfortable to report hazards, issues, and concerns, as well as occurrences, incidents, etc., and propose safety solutions and improvements. The Accountable Manager and other key safety personnel need to encourage employees to report safety issues without fear of reprisal. Policies that assure employees of fair treatment and clear standards of behaviour are an essential part of maintaining a reporting culture.

8. Confidential reporting. Organisations should define methods for employee reporting and de-identification of sources without losing essential information. As you develop and employ the confidential reporting procedures and include its input in safety decision making, employees will begin to trust the system to work toward elimination of systemic problems. This, in turn, will stimulate greater participation in employee reporting of safety concerns. A segment of the reports generated within an organisation, had to be provided to the MAA-NLD in accordance with SMAR-1 – Occurrence Reporting.

9. Safety investigations. To be effective and supported, the safety reporting system should conduct safety investigations to identify underlying causes and potential aviation safety hazards for existing and future operations. It is understood that the severity or possible severity of the occurrence will normally determine the level of investigation. The results of the report should be provided through feedback to the reporter (or whole organisation) with a description of actions taken and any other relevant information. The MAA-NLD may wish to conduct an independent investigation on any safety occurrence. This will normally be afforded to occurrences that have been identified by the MAA-NLD as 'Accidents' or 'Serious Incidents' as defined by the NLD-MAD-1 Glossary of Terms.

10. Communication of safety findings. Safety findings identified as part of the safety assurance process or SPI reviews should be acted upon to the extent necessary to optimise SMS performance. Those who can act on safety findings, or need to be informed, can be quite varied. Communicating important safety findings to the Accountable Manager and other key safety personnel is essential to ensure the information can be used to inform decision making. Given the volume and frequency of possible findings, a graduated approach should be used, based on criteria which may include the assessed risk of the finding, the possible affected parties or the resources required to correct the finding.

MANAGEMENT OF CHANGE

11. Either self-generated or imposed, most changes at the organisation have the ability to affect the appropriateness or effectiveness of existing safety risk controls. Additionally, whenever change occurs, the opportunity exists for new aviation safety hazards to be inadvertently introduced. Hazards resulting from any change to what is considered to be the 'status quo' should therefore be identified and addressed through the safety risk management process. Changes can take many forms, including, for example, internal and external safety reviews and audits, nominal staff turn-over, shift-work changes, increased operational tempo, changes to work location, introduction of new technologies or processes, etc.

12. The organisation's documented change management procedure should consider:

a. **Hazards, risks and mitigations.** Hazard identification and risk assessments should be conducted to understand the potential implications of the change and inform the decision maker whether to implement the change. Controls should then be implemented to mitigate any risks posed.

b. **Monitoring.** The assurance system should be used to monitor the effectiveness of implemented controls and monitor for additional risks.

CONTINUOUS IMPROVEMENT OF THE SMS

13. Continuous improvement of the SMS is required to ensure ongoing improvements in the level of performance of the system using evidence from audits, reviews and surveys. It can be broken down into two distinct feedback cycles:

a. **System Design.** Key safety personnel need to ensure that shortfalls (policies, procedures and tools in an SMS are insufficient or ineffective) in the design of the SMS are addressed as soon as possible.

b. **System Operation.** Key safety personnel need to ensure that the SMS is operating as it is described in related SMS documentation.

14. Assurance processes could make use of the SMS assessment tools to help ensure that the system design is complete and suitable in accordance with the NLD-MAR-145.

AMC 145.A.67(b)4 and (f) Safety Management System (SMS)

Safety promotion. The organisation's safety promotion system will provide employees with effective SMS training commensurate with their safety responsibilities, creating a means to deliver organisation-wide safety communication. The safety promotion component of an SMS and had to include the following:

(a) Training and education. The organisation will ensure that personnel are trained and competent to perform their SMS duties. The scope of safety training will be commensurate with the individual's involvement in the SMS and can demonstrate the following:

(i) There is a documented process to identify safety management training requirements so that personnel are competent to perform their duties and takes appropriate remedial action when necessary.

(ii) Appropriate action is taken to measure and possibly improve the effectiveness of training.

(iii) A training record is maintained for all personnel.

(b) Safety Communication. The organisation will ensure that personnel, internal and external to the organisation, have current and pertinent safety information and can demonstrate the following:

(i) There is a communication strategy to ensure the safety policy and safety information is communicated to all personnel with the intent that they are made aware of their individual contributions and obligations with regard to safety.

(ii) Significant events and investigation outcomes associated with the organisation are communicated to all personnel, including contracted organisations where appropriate.

GM 145.A.67(b)4 Safety Management System (SMS)

1. **Safety promotion** covers the following elements:

- a. Training and education, and
- b. Safety communication.

2. Safety Promotion is an important component for supporting and creating an effective SMS. effective safety promotion will notify the workforce of relevant safety trends and events, train them to understand and use the SMS, and promote a generative safety culture. If executed poorly it will undermine an organisation's safety culture and lead to inefficiencies due to poor understanding of processes, expectations and responsibilities. Safety promotion is essential in creating an environment that is conducive to achieving the organisation's safety objectives, as agreed in the SMS implementation plan. It provides a sense of purpose to organisation's safety efforts and enables the continuous improvement process. Over a period of time, effective safety promotion should:

- a. Develop a culture of doing the right thing at the right time.
- b. Support safety culture communication and dissemination of lessons learnt.
- c. Assist employees in understanding their roles in maintaining safe operations.
- d. Encourage bottom-up communication.

3. An organisation's level of safety cannot be improved solely by being directed to do so, or by strict adherence to published policies. Safety promotion affects both individual and organisational culture, and supplements the organisation's policies, procedures and processes by providing and supporting tangible and intangible evidence, and values, to support safety efforts. Safety culture is dynamic, and needs to be constantly reinforced as the organisation is affected by either nominal or imposed changes; e.g. postings, resignations, staff movements and reforms.

TRAINING AND EDUCATION

4. Organisations need to facilitate safety training relevant to specific issues encountered in their context. The provision of training and education to appropriate staff, regardless of their level in the organisation, is an indication of management's commitment to an effective SMS. safety training and education at the local level should complement core promotion and specialisation courses, and be adapted to organizational context. Generally, local training and education should ensure coverage of the following topics and the benefits adapted for position/rank and responsibilities at the organisation:

- a. organisational safety policies, objectives, targets, and Safety Performance Indicators (SPI)
- b. safety roles and responsibilities of all staff levels
- c. safety risk management principles
- d. reactive, proactive and predictive safety reporting systems
- e. management's visible support of safety
- f. communication of safety-related information
- g. resource management
- h. human factors
- i. training effectiveness validation systems
- j. training recording and re-currency requirements
- k. continuous safety improvement methodologies.

5. As each individual within an organisation has safety responsibilities, safety training and education needs to ensure that personnel are competent to perform the safety-related duties expected. Personnel closer to the end product should be trained in practical implementation of safety concepts, and the outcomes expected. Personnel in management style positions should focus on high level SMS concepts and implementation. Given the different training coverage dependent on position and seniority, there is no one-size fits all approach to safety training and education.

SAFETY COMMUNICATION

6. The purpose of safety communication is to ensure that aviation safety issues are openly, effectively and regularly discussed and disseminated within, and external to, the organisation. This includes coverage of SMS objectives, targets, SPIs and trends, procedures and remedial actions as a result of feedback or safety performance.

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7. Safety communication therefore aims to:

- a. Ensure that staff are fully aware of the scope of their SMS and their part in it.
- b. Convey safety-critical information and resultant actions in language the audience can relate to.
- c. Encourage timely, relevant and clear two-way discussions.
- d. Raise awareness of hazards and treatment effectiveness.
- e. Provide transparent information regarding changes at the organisation and their assessed safety impacts.
- f. Provide feedback on organisation safety performance indicators and resultant preventive/corrective actions.
- g. Share successes and lessons learned.

8. Safety communication can take any form that most effectively imparts the outcomes sought to the audience required. Successful safety communication strategies employ multiple means of communication, each adapted for a different type of safety information and audience. Safety information has no value unless the audience learns from it, which in its simplest form reinforces safety awareness and at its most complex, stimulates action to mitigate future risks. Visual, verbal, written or interactive communication means can be used effectively. Bulletins, briefings, safety groups, scrolling banners on web pages and hazard and incident workshops, among others, have been used successfully in the past as part of an overall coordinated safety communication strategy. Lessons learned can also be gained from sharing information with, and from, other organisations.

9. Safety communication should be disseminated both internally and externally to the organisation and flow effectively between management and staff. This will ensure all stakeholders are communicating and receiving feedback on the diverse range of safety issues at the appropriate time.

AMC 145.A.70(a) Maintenance Organisation Exposition (MOE)

The following information should be included in the maintenance organisation exposition:

1. The information specified in NLD-MAR-145.A.70(a) subparagraphs (6) and (12) to (16) inclusive, whilst a part of the MOE, may be kept as separate documents or on separate electronic data files subject to the management part of this MOE containing a clear cross-reference to such documents or electronic data files.
2. The MOE should contain the information, as applicable, specified in this AMC. The information may be presented in any subject order as long as all applicable subjects are covered. Where a maintenance organisation uses a different format, for example, to allow the MOE to serve for more than one approval, then the MOE should contain a cross-reference annex using this list as an index with an explanation as to where the subject matter can be found in the MOE.

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3. The MOE should contain information, as applicable, on how the maintenance organisation complies with CDCCL instructions (if applicable).

4. NOT APPLICABLE.

5. The maintenance organisation may use electronic data processing (EDP) for publication of the MOE. The MOE should be made available to the MAA-NLD in a form acceptable to the MAA-NLD. Attention should be paid to the compatibility of EDP publication systems with the necessary dissemination of the MOE, both internally and externally.

6. The following information should be included in the MOE:

PART 0 GENERAL ORGANISATION

This Section is reserved for:

1. A maintenance organisation seeking approval under NLD-MAR-145, which is also part of an Operating Organisation.

2. An Original Equipment Manufacturer (OEM) seeking approval as a maintenance organisation under NLD-MAR-145. For these organisations, among other organisational aspects, this section should illustrate how the maintenance organisation will be independent from other organisational functions (e.g. design and production/ engineering tasks, operations).

PART 1 MANAGEMENT

- 1.1 Corporate commitment by the Accountable Manager
- 1.2 Quality and safety and policy
- 1.3 Management personnel
- 1.4 Duties and responsibilities of the management personnel, including safety responsibilities
- 1.5 Management organisation chart
- 1.6 List of certifying staff and support staff
- 1.7 Manpower resources
- 1.8 General description of the facilities at each address intended to be approved
- 1.9 Organisations intended scope of work
- 1.10 Notification procedure to the MAA-NLD regarding changes to the maintenance organisation's activities/approval/location/personnel
- 1.11 MOE amendment procedures including, if applicable, delegated procedures

PART 2 MAINTENANCE PROCEDURES

- 2.1 Supplier evaluation and contract/tasking control procedure
- 2.2 Acceptance/inspection of aircraft components and material from outside contractors/organisations
- 2.3 Storage, tagging and release of aircraft components and material to aircraft maintenance
- 2.4 Acceptance of tools and equipment
- 2.5 Calibration of tools and equipment
- 2.6 Use of tooling and equipment by staff (including alternative tools)
- 2.7 Cleanliness standards of maintenance facilities

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- 2.8 Maintenance instructions and relationship to aircraft/aircraft component manufacturers' instructions including updating and availability to staff
- 2.9 Repair procedures
- 2.10 Aircraft Maintenance Programme compliance
- 2.11 Airworthiness Directives procedure
- 2.12 Optional modification procedure
- 2.13 Maintenance documentation in use and completion of same
- 2.14 Technical record control
- 2.15 Rectification of defects arising during base maintenance
- 2.16 Release to service procedure
- 2.17 Maintenance records for the Operating Organisation/CAMO
- 2.18 Reporting of defects to the MAA-NLD/CAMO/(Military) TC/STC Holder
- 2.19 Return of defective aircraft components to store
- 2.20 Management of defective components with outside contractors/organisations
- 2.21 Control of computer maintenance record systems
- 2.22 Control of man-hour planning versus scheduled maintenance work
- 2.23 Control of critical tasks
- 2.24 Reference to specific maintenance procedures such as:
 - Engine running procedures
 - Aircraft pressure run procedures
 - Aircraft towing procedures
 - Aircraft taxiing procedures
 - Aircraft military specific systems procedures
- 2.25 Procedures to detect and rectify maintenance errors
- 2.26 Shift/task handover procedures
- 2.27 Procedures for notification of maintenance data inaccuracies and ambiguities, to the MAA-NLD/(military) TC/STC holder
- 2.28 Maintenance planning procedures

PART L2 ADDITIONAL LINE MAINTENANCE PROCEDURES

- L2.1 Line maintenance control of aircraft components, tools, equipment, etc.
- L2.2 Line maintenance procedures related to servicing/fuelling/de-icing including inspection for/removal of de-icing/anti-icing fluid residues, etc.
- L2.3 Line maintenance control of defects and repetitive defects
- L2.4 Line procedure for completion of aircraft technical log
- L2.5 Line procedure for pooled parts and loan parts
- L2.6 Line procedure for return of defective parts removed from aircraft
- L2.7 Line procedure control of critical tasks

PART 3 QUALITY AND SAFETY MANAGEMENT SYSTEM PROCEDURES

- 3.1 Quality audit of organisation procedures
- 3.2 Quality audit of aircraft and components
- 3.3 Quality audit remedial action procedure
- 3.4 Certifying staff and support staff qualification and training procedures
- 3.5 Certifying staff and support staff records
- 3.6 Procedures for qualifying of quality audit personnel
- 3.7 Procedures for qualifying of supervisors
- 3.8 Procedures for qualifying of maintenance personnel
- 3.9 Aircraft or aircraft component maintenance tasks exemption process control
- 3.10 Concession control for deviation from organisations' procedures

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- 3.11 Qualification procedure for specialised activities such as NDT, welding, etc.
- 3.12 Control of manufacturers' and other maintenance working teams
- 3.13 Human factors training procedure
- 3.14 Competence assessment of personnel
- 3.15 Training procedures for On-the-Job Training as per Section 6 of Appendix III to NLD-MAR-66
- 3.16 Procedure for the issue of a recommendation to the MAA-NLD for the issue of a MAML in accordance with NLD-MAR-66.B.105
- 3.17 Hazard identification and safety and safety risk management schemes
- 3.18 Safety action planning
- 3.19 Safety performance monitoring
- 3.20 Incident investigation and safety reporting
- 3.21 Emergency response planning
- 3.22 Management of change (including organisational changes with regard to safety responsibilities)
- 3.23 Safety promotion
- 3.24 Management system record keeping

PART 4 EXTERNAL PARTIES

This section is reserved for describing the procedures, paperwork and records associated with the CAMOs that place tasks on the maintenance organisation.

- 4.1 Contracting / tasking CAMO
- 4.2 CAMO procedures / paperwork
- 4.3 CAMO record completion

PART 5 SUPPORTING DOCUMENTS

- 5.1 Sample of documents
- 5.2 List of contractors/tasked organisations as per NLD-MAR-145.A.75(b)
- 5.3 List of Line maintenance locations as per NLD-MAR-145.A.75(d)
- 5.4 List of contracted/tasked organisations as per NLD-MAR-145.A.70(a)(16)

PART 6 OPERATING ORGANISATION'S MAINTENANCE PROCEDURES

This section is reserved for those maintenance organisations who are also part of Operating Organisations.

PART 7 NOT APPLICABLE

PART 8 NOT APPLICABLE

GM 145.A.70(a) Maintenance Organisation Exposition (MOE)

1. The purpose of the MOE is to detail the procedures, means and methods of the maintenance organisation.
2. Compliance with its contents will assure compliance with the requirements of NLD-MAR-145, which is a prerequisite to obtaining and retaining a maintenance organisation approval certificate.

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3. NLD-MAR-145.A.70(a)(1) to (a)(11) constitutes the 'management' part of the MOE and therefore could be produced as one document and made available to the person(s) specified under NLD-MAR-145.A.30(b) who should be reasonably familiar with its contents. NLD-MAR-145.A.70(a)(6) list of certifying staff and support staff may be produced as a separate document.

4. NLD-MAR-145.A.70(a)(12) constitutes the working procedures of the maintenance organisation and therefore as stated in the requirement may be produced as any number of separate procedures manuals. It should be remembered that these documents should be cross-referenced from the management MOE.

5. Personnel are expected to be familiar with those parts of the MOE/manuals that are relevant to the maintenance work they carry out.

6. The maintenance organisation should specify in the MOE who should amend the MOE/manuals particularly in the case where there are several parts.

7. The quality manager should be responsible for monitoring the amendment of the MOE, unless otherwise agreed by the MAA-NLD, including associated procedures manuals and submission of the proposed amendments to the MAA-NLD. However, the MAA-NLD may agree via a procedure stated in the amendment section of the MOE that some defined class of amendments may be incorporated without prior approval by the MAA-NLD.

8. The MOE should cover four main parts:

a. The management MOE covering the parts specified earlier.

b. The maintenance procedures covering all aspects of how aircraft components may be accepted from outside sources and how aircraft, engines and or components will be maintained to the required standard.

c. The quality and safety management system procedures including the methods of qualifying mechanics, inspection, certifying staff, support staff and audit personnel.

d. Contracting/tasking procedures and paperwork.

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9. The Accountable Manager's MOE statement as specified under NLD-MAR-145.A.70(a)(1) should embrace the intent of the following paragraph and this statement may be used without amendment. Any modification to the statement should not alter the intent.

“This MOE and any associated referenced manuals define the organisation and procedures upon which the MAA-NLD NLD-MAR-145 approval is based as required by NLD-MAR-145.A.70. These procedures are approved by the undersigned and should be complied with, as applicable, when work orders are being progressed under the terms of the NLD-MAR-145 approval.

It is accepted that these procedures do not override the necessity of complying with any new or amended regulation published by the MAA-NLD from time to time where these new or amended regulations are in conflict with these procedures.

It is understood that the MAA-NLD will approve this maintenance organisation whilst the MAA-NLD is satisfied that the procedures are being followed and work standards maintained. It is further understood that the MAA-NLD reserves the right to suspend, limit or revoke the approval of the maintenance organisation if the MAA-NLD has evidence that procedures are not followed or standards not upheld.”

Signed

Dated

Accountable Manager and (quote position)

For and on behalf of(quote maintenance organisation's name)

Whenever the Accountable Manager changes, it is important to ensure that the new Accountable Manager signs the paragraph 9 statement at the earliest opportunity.

Failure to carry out this action could invalidate the NLD-MAR-145 approval.

10. When an organisation is approved against any other NLD-MAR (or EASA equivalent Regulation) containing a requirement for an Exposition, an NLD-MAR-145 MOE covering the differences will suffice to meet the requirements except that the NLD-MAR-145 MOE should reference where those parts missing from this MOE are covered.

AMC 145.A.75(b) Privileges of the AMO

1. Working under the quality and safety management system of the AMO refers to the case of one maintenance organisation, not itself appropriately approved to NLD-MAR-145 that carries out aircraft line maintenance or minor engine maintenance or maintenance of other aircraft components or a specialised service as a contractor/tasked maintenance organisation for a maintenance organisation appropriately approved under NLD-MAR-145. To be appropriately approved to contract/task with a non-approved maintenance organisation, the AMO should have a procedure for the control of such contractors/tasked maintenance organisations as described below.

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2. Maintenance of engines or engine modules other than a complete workshop maintenance check or overhaul is intended to mean any maintenance that can be carried out without disassembly of the core engine or, in the case of modular engines, without disassembly of any core module.

3. Fundamentals of contracting/tasking a non-approved maintenance organisation under NLD-MAR-145.

3.1 The fundamental reasons for allowing an AMO to contract/task a non-approved maintenance organisation certain maintenance tasks are:

(a) To permit the acceptance of specialised maintenance services, such as, but not limited to, plating, heat treatment, plasma spray, fabrication of specified parts for minor repairs / modifications, etc., without the need for direct approval by the MAA-NLD in such cases.

(b) To permit the acceptance of aircraft maintenance up to but not including a base maintenance check as specified in NLD-MAR-145.A.75(b) by maintenance organisations not appropriately approved under NLD-MAR-145 when it is unrealistic to expect direct approval by the MAA-NLD. The MAA-NLD should determine when it is unrealistic but in general it is considered unrealistic if only one or two AMOs intend to use the contracted/tasked maintenance organisation.

(c) To permit the acceptance of component maintenance.

(d) To permit the acceptance of engine maintenance up to but not including a workshop maintenance check or overhaul of an engine or engine module as specified in NLD-MAR-145.A.75(b) by maintenance organisations not appropriately approved under NLD-MAR-145 when it is unrealistic to expect direct approval by the MAA-NLD. The determination of unrealistic is as per subparagraph (b).

3.2 When maintenance is carried out under the 'contract/task with a non-approved maintenance organisation' control system it means that for the duration of such maintenance, the NLD-MAR-145 approval has been temporarily extended to include the non-approved contractor/tasked maintenance organisation. Consequently, those parts of the non-approved contractor's/tasked maintenance organisation's facilities, personnel and procedures involved with the AMO's products undergoing maintenance should meet NLD-MAR-145 requirements for the duration of that maintenance and it remains the AMO's responsibility to ensure such requirements are satisfied.

3.3 For the criteria specified in subparagraph 3.1, the AMO is not required to have complete facilities for maintenance that it needs to contract/task. Nevertheless, it should have its own expertise to determine that the non-approved contractor/tasked maintenance organisation meets the necessary standards. However, a maintenance organisation cannot be approved unless it has the in-house facilities, procedures and expertise to carry out the majority of maintenance for which it wishes to be approved in terms of the number of class ratings.

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3.4 The AMO may find it necessary to include several specialist non-approved contractors/tasked maintenance organisations to enable it to be approved to completely certify the release to service of a particular product. Examples could be specialist welding, electro-plating, painting etc. To authorise the use of such non-approved contractors/tasked maintenance organisations, the MAA-NLD should be satisfied that the AMO has the necessary expertise and procedures to control such non-approved contractors/tasked maintenance organisations.

3.5 An AMO working outside the scope of its approval schedule is deemed to be not approved for this work. Such an AMO should in this circumstance operate only under the contracted/tasked control of another AMO.

3.6 Authorisation to contract/task non-approved maintenance organisations is indicated by the MAA-NLD accepting the MOE containing a specific procedure on the control of non-approved contractors/tasked maintenance organisations.

4. Principal NLD-MAR-145 procedures for the control of contractors/tasked maintenance organisations not approved under NLD-MAR-145.

4.1 A pre-audit procedure should be established whereby the AMO's 'contract/task a non-approved maintenance organisation' control section, which may also be the NLD-MAR-145.A.65(c) quality system independent audit section, should audit a prospective non-approved contractor/tasked maintenance organisation to determine whether those services of the non-approved contractor/tasked maintenance organisation that it wishes to use meet the intent of NLD-MAR-145.

4.2 The AMO should assess to what extent it will use the non-approved contractor's/tasked maintenance organisation's facilities. As a general rule the AMO should require its own paperwork, approved data and material/spare parts to be used, but it could permit the use of tools, equipment and personnel from the non-approved contractor/tasked maintenance organisation as long as such tools, equipment and personnel meet the requirements of NLD-MAR-145. In the case of non-approved contractors/tasked maintenance organisations who provide specialised services it may, for practical reasons, be necessary to use their specialised services personnel, approved data and material subject to acceptance by the AMO.

4.3 Unless the contracted/tasked maintenance work can be fully inspected on receipt by the AMO, the AMO should supervise the inspection and release from the non-approved contractor/tasked maintenance organisation. Such activities should be fully described in the MOE. The AMO should consider whether to use its own staff or authorise the non-approved contractor's/tasked maintenance organisation's staff.

4.4 The CRS for components may be issued either at the non-approved contractor/tasked maintenance organisation or at the AMO facility by staff holding a certification authorisation in accordance with NLD-MAR-145.A.30 as appropriate. Such staff would normally come from the AMO but may otherwise be a person from the non-approved contractor/tasked maintenance organisation who meets the AMO certifying staff standard which itself is approved by the MAA-NLD via the

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MOE. The CRS for components and/or the NLD-MAR Form 1 should always be issued under the AMO approval reference.

4.5 The 'contract/task a non-approved maintenance organisation' control procedure should record audits of the non-approved contractor/tasked maintenance organisation, to have a corrective action follow-up plan and to know when non-approved contractors/tasked maintenance organisations are being used. The procedure should include a clear revocation process for non-approved contractors/tasked maintenance organisations who do not meet the AMO's requirements.

4.6 The AMO's audit staff should audit the 'non-approved maintenance organisation contract/tasking control section' and sample audit non-approved contractors/tasked maintenance organisations unless this task is already carried out by the audit staff as stated in subparagraph 4.1.

4.7 The contract between the AMO and the non-approved contractor/tasked maintenance organisation should contain a provision for the MAA-NLD or a qualified entity acting on behalf of the MAA-NLD to have right of access to the non-approved contractor/tasked maintenance organisation.

AMC 145.A.75(d) Privileges of the AMO

In case the AMO wants to use an additional line maintenance location, not described in the MOE or the approval certificate, for a minimum period of twelve weeks the organisation shall apply for an approval of this temporary extension of the scope to the MAA-NLD by means of NLD-MAR Form 2a (Appendix VIII to NLD-MAR AMC 145.A.75(d)). This shall be done prior to the usage of the location. Each application for an additional line maintenance location shall be substantiated with a self-evaluation, focused on the scope of the application, by which the organisation:

- a. has determined to what level the existing MOE-procedures (including chapter L2) are sufficient to describe the planned activities on the new maintenance location;
- b. has described any necessary temporary deviation from the existing MOE-procedures in a location specific additional L2-procedure to remain compliant to this NLD-MAR;
- c. presents the results of both assessments in a *Compliance-Checklist report*, which gives per (sub)paragraph a clear description of the way the organisation is compliant to the applicable requirements at the additional line maintenance location.

AMC 145.A.80 Limitations on the AMO

This paragraph is intended to cover the situation where an AMO may temporarily not hold all the necessary tools, equipment etc., for an aircraft type or variant specified in the AMO's approval. This paragraph means that the MAA-NLD need not amend the approval to delete the aircraft type or variants on the basis that it is a temporary situation and there is a commitment from the AMO to re-acquire tools, equipment etc. before maintenance on the type may recommence.

GM 145.A.85 Changes to the AMO

Refer to GM 145.A.15.

SECTION B

PROCEDURES FOR NETHERLANDS MILITARY AIRWORTHINESS AUTHORITY

AMC 145.B.10(a) MAA-NLD – General

1. In deciding upon the required organisational structure, the MAA-NLD should review the number of certificates to be issued, the number and size of potential AMOs within that pMS, as well as the level of military aviation activity, number and complexity of aircraft and the size of the pMS's aviation industry.
2. The MAA-NLD should retain effective control of important surveillance functions and not delegate them in such a way that AMOs, in effect, regulate themselves in airworthiness matters.
3. The set-up of the organisational structure should ensure that the various tasks and obligations of the MAA-NLD are not relying on individuals. That means that a continuing and undisturbed fulfilment of these tasks and obligations of the MAA-NLD should also be guaranteed in case of illness, accident or leave of individuals.

AMC 145.B.10(c) MAA-NLD – Qualification and training

1. MAA-NLD surveyors should have:
 - 1.1 practical experience and expertise in the application of aviation safety standards and safe operating practices;
 - 1.2 comprehensive knowledge of:
 - a. relevant parts of national implementing rules/regulations, certification specifications, airworthiness codes and guidance material;
 - b. the MAA-NLD's procedures;
 - c. the rights and obligations of a surveyor;
 - d. quality and safety management systems;
 - e. continuing airworthiness management;
 - f. operational procedures when affecting the continuing airworthiness management of the aircraft or the maintenance.
 - 1.3 training on auditing techniques, assessing and evaluating safety management systems.
 - 1.4 five years relevant work experience to be allowed to work as a surveyor independently. This may include, but should not be limited to, experience gained during training to obtain the subparagraph 1.5 (below) qualification.

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1.5 a relevant engineering degree or an aircraft maintenance technician qualification with appropriate additional education. 'Relevant engineering degree' means an engineering degree from aeronautical, mechanical, electrical, electronic, avionic or other studies relevant to the maintenance and continuing airworthiness of aircraft/aircraft components.

1.6 knowledge of maintenance standards, including Fuel Tank Safety (FTS) training as described in "Appendix IV to AMC 145.A.30(e) and AMC 145.B.10(c)".

1.7 knowledge and understanding of Human Factors, as described in NLD-MAR-145.

2. In addition to technical competency, surveyors should have a high degree of integrity, be impartial in carrying out their tasks, be tactful, and have a good understanding of human nature.

3. A programme for continuation training should be developed ensuring that the surveyors remain competent to perform their allocated tasks.

AMC 145.B.10(d) MAA-NLD – Procedures

The documented procedures should contain the following information:

(a) The pMS' designation of the MAA-NLD.

(b) The title(s) and name(s) of the manager(s) of the MAA-NLD and their duties and responsibilities.

(c) Organisation chart(s) showing associated chains of responsibility of the senior persons.

(d) A procedure defining the qualifications for staff together with a list of staff authorised to sign certificates.

(e) A general description of the facilities.

(f) Procedures specifying how the MAA-NLD ensures compliance with NLD-MAR-145.

AMC 145.B.20(a) Initial approval (*)

1. 'The MAA-NLD shall formally indicate its acceptance of the personnel,' means that the NLD-MAR Form 4 should be used for this activity. With the exception of the Accountable Manager, an NLD-MAR Form 4 should be completed for each person nominated to hold a position as required by NLD-MAR-145.A.30(b) and (c).

2. Formal indication of acceptance should be by use of the NLD-MAR Form 4 or in the case of the Accountable Manager via approval of the MOE containing the Accountable Manager's commitment statement.

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3. The MAA-NLD may reject an Accountable Manager where there is clear evidence that they previously held a senior position in any other approved Organisation and abused that position by not complying with the particular requirements in force.

* See Appendix I to AMC 145.B.20(a): NLD-MAR Form 4

AMC 145.B.20(b) Initial approval

Verification that the maintenance organisation complies with the MOE procedures should be established by the MAA-NLD approving the MOE.

AMC 145.B.20(c) Initial approval

1. The MAA-NLD should determine by whom, and how the audit should be conducted. For example, for a large maintenance organisation, it will be necessary to determine whether one large team audit or a short series of small team audits or a long series of single man audits are most appropriate for the particular situation.

2. It is recommended that the audit is carried out on a product line type basis in that, for example, in the case of an maintenance organisation with A400M and C-130 ratings, the audit be concentrated on one type only for a full compliance check and dependent upon the result, the second type may only require a sample check against those activities seen to be weak on compliance for the first type.

3. The MAA-NLD auditing surveyor should always ensure that he/she is accompanied throughout the audit by a senior technical member of the maintenance organisation. Normally this is the quality manager. The reason for being accompanied is to ensure the maintenance organisation is fully aware of any findings during the audit.

4. The auditing surveyor should inform the senior technical member of the maintenance organisation at the end of the audit visit on all findings made during the audit.

AMC 145.B.20(e) Initial approval (*)

1. The audit report form should be the NLD-MAR Form 6 or the equivalent report from EMPIC.

2. A quality review of the NLD-MAR Form 6/EMPIC audit report form should be carried out by a competent independent person nominated by the MAA-NLD. The review should take into account the relevant paragraphs of NLD-MAR-145, the categorisation of finding levels and the closure action taken. Satisfactory review of the audit form should be indicated by a signature on the audit form.

* See Appendix II to AMC 145.B.20(e): NLD-MAR Form 6

AMC 145.B.20(f) Initial approval

1. The reports should include the date each finding was cleared together with reference to the MAA-NLD report or letter that confirmed the clearance.

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2. There may be occasions when the MAA-NLD surveyor may find situations in the applicant's maintenance organisation on which he/she is unsure about compliance. In this case, the maintenance organisation should be informed about possible non-compliance at the time and the fact that the situation will be reviewed within the MAA-NLD before a decision is made. If the decision is a finding of being in compliance then a verbal confirmation to the maintenance organisation should suffice.

3. Findings should be recorded on the audit report form with a provisional categorisation as a level 1 or 2. Subsequent to the audit visit that identified the particular findings, the MAA-NLD should review the provisional finding levels, adjusting them if necessary and change the categorisation from "provisional" to "confirmed".

4. All findings should be confirmed in writing to the applicant maintenance organisation within 2 weeks of the audit visit.

AMC 145.B.25(a) Issue of approval

1. NOT APPLICABLE.

2. NOT APPLICABLE.

3. The MAA-NLD should indicate approval of the MOE in writing.

AMC 145.B.25(b) Issue of approval

The validity of the NLD-MAR 145 approval should be of unlimited duration.

AMC 145.B.25(c) Issue of approval

The numeric sequence should be unique to the particular AMO.

AMC 145.B.30(a) Continuing oversight

Credit may be claimed by the MAA-NLD surveyor(s) for specific item audits completed during the preceding 23 month period subject to four conditions:

- the specific item audit should be the same as that required by NLD-MAR-145 latest amendment; and
- there should be satisfactory evidence on record that such specific item audits were carried out and that all corrective actions have been taken; and
- the MAA-NLD surveyor(s) should be satisfied that there is no reason to believe standards have deteriorated in respect of those specific item audits being granted a back credit; and
- the specific item audit being granted a back credit should be audited not later than 24 months after the last audit of the item.

AMC 145.B.30(b) Continuing oversight

1. Where the MAA-NLD has decided that a series of audit visits are necessary to arrive at a complete audit of an AMO, the program should indicate which aspects of the approval will be covered on each visit.
2. It is recommended that part of an audit concentrates on two on-going aspects of the NLD-MAR-145 approval:
 - the AMO's internal self-monitoring quality reports produced by the quality monitoring personnel to determine if the AMO is identifying, controlling and correcting non-compliances, and controlling concessions granted by the quality manager for deviations from the organisations procedures.
 - the organisation's safety management processes to determine how effectively the organisation is managing safety risks.
3. At the successful conclusion of the audit including approval of the MOE, an audit report form should be completed by the auditing surveyor including all recorded findings, closure actions and recommendation. An NLD-MAR Form 6/EMPIC report should be used for this activity.
4. The Accountable Manager should be seen at least once every 24 months to ensure he/she fully understands the significance of the approval.
5. In the case of line stations the MAA-NLD can adopt a sampling program based upon the number of line stations and their complexity.

AMC 145.B.35 Changes

The MAA-NLD should have adequate control over any changes to the management personnel specified in NLD-MAR-145.A.30(a), (b) and (c) and such changes in personnel should require an amendment to the MOE.

AMC 145.B.35(a) Changes

The applicable part(s) of the NLD-MAR Form 6 should be used for the changes to the NLD-MAR-145 approval.

AMC 145.B.35(b) Changes

The primary purpose of this paragraph is to enable the AMO to remain approved if agreed by the MAA-NLD during negotiations about any of the specified changes. Without this paragraph the approval would automatically be suspended in all cases.

AMC 145.B.40 MOE amendments

1. It is recommended that a simple MOE status sheet is maintained which contains information on when an amendment was received by the MAA-NLD and when it was approved.

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2. The MAA-NLD may define some class of amendments to the MOE which may be incorporated without prior authority approval. In this case a procedure should be stated in the amendment section of the MOE. The MOE chapter dealing with scope of work/approval should not be subject to this procedure.

3. The AMO should submit each MOE amendment to the MAA-NLD whether it is an amendment for direct approval or an indirect approval amendment. Where the amendment requires approval by the MAA-NLD, the MAA-NLD should indicate its approval in writing when satisfied. Where the amendment has been submitted under the indirect approval procedure the MAA-NLD should acknowledge receipt in writing.

AMC 145.B.50(a) Findings

In practical terms a level 1 finding is where a MAA-NLD finds a significant non-compliance with NLD-MAR-145. The following are examples of level 1 findings:

- Failure to gain access to the AMO during normal operating hours of the AMO in accordance with NLD-MAR-145.A.90(a)(2) after two written requests.
- If the calibration control of equipment as specified in NLD-MAR-145.A.40(b) had previously broken down on a particular type product line such that most “calibrated” equipment was suspect from that time then that would be a level 1 finding.

Note: A complete product line is defined as all the aircraft, engines or components of a particular type.

For a level 1 finding it may be necessary for the MAA-NLD to ensure that further maintenance and re-certification of all affected products is accomplished, dependent upon the nature of the finding.

In practical terms where a MAA-NLD surveyor finds a non-compliance with NLD-MAR-145 against one product, it is deemed to be a level 2 finding. The following are examples of level 2 findings:

- One time use of a component without any serviceable tag.
- The training documents of the certifying staff or support staff are not completed.

AMC 145.B.50(b) Findings

Where the AMO has not implemented the necessary corrective action within that period it may be appropriate to grant a further period of up to three months, subject to the MAA-NLD notifying the Accountable Manager. In exceptional circumstances and subject to a realistic action plan being in place, the MAA-NLD may specifically vary the maximum 6 month corrective action period. However, in granting such a change the past performance of the AMO should be considered.

AMC 145.B.55 Record-keeping

1. The record-keeping system should ensure that all records are accessible whenever needed within a reasonable time. These records should be organised in a consistent way throughout the MAA-NLD (chronological, alphabetical order, etc.).
2. All records containing sensitive data regarding applicants or AMOs should be stored in a secure manner with controlled access to ensure confidentiality of this kind of data.
3. All computer hardware used to ensure data backup should be stored in a different location from that containing the working data in an environment that ensures they remain in good condition. When hardware or software changes take place special care should be taken to ensure that all necessary data continues to be accessible at least through the full period specified in NLD-MAR-145.B.55.

GM 145.B.55 Record-keeping

The MAA-NLD may elect to use either a paper or computer system or any combination of both subject to appropriate controls.

FINAL CLAUSES

- (a) This ruling is known as: NLD-MAR-145 AMC & GM.
- (b) An announcement regarding this ruling will be published in the State paper (Staatscourant) and this ruling will be included in the Ministerial Publications.

Hoofddorp, 1 March 2019

For the Minister of Defence,
The Director Military Aviation Authority,

J.P. Apon
Air Commodore

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AMC to Appendix I to NLD-MAR-145

AMC to NLD-MAR Form 1 is contained in the NLD-MAR Form 1 and is published on MAA-NLD intranet and internet.

APPENDICES TO AMCs

Appendix I to AMC 145.B.20(a): NLD-MAR Form 4

NLD-MAR Form 4 is published on the MAA-NLD intranet and internet.

Appendix II to AMC 145.B.20(e): NLD-MAR Form 6

NLD-MAR Form 6 is published on the MAA-NLD intranet and internet.

Appendix III to AMC 145.A.15 NLD-MAR Form 2

NLD-MAR Form 2 is published on the MAA-NLD intranet and internet.

Appendix IV to AMC 145.A.30(e) and AMC 145.B.10(c)

Fuel Tank Safety training

This Appendix includes general instructions for providing training on Fuel Tank Safety (FTS) issues.

A) Applicability:

As nationally defined by the MAA-NLD.

B) Affected organisations:

AMOs involved in the maintenance of aircraft specified in paragraph A) and fuel system components installed on such aircraft when the maintenance data are affected by CDCCL (if applicable).

CAMO's involved in the continuing airworthiness management of aeroplanes specified in paragraph A).

MAA-NLD responsible as per NLD-MAR-145.B.30 for the oversight of the AMOs specified in this paragraph B and as per NLD-MAR-M.B.704 for the oversight of CAMOs specified in this paragraph B).

C) Persons from affected organisations who should receive training:

Phase 1 only:

The group of persons representing the maintenance management structure of the AMO, the quality manager and the staff required to quality monitor the AMO.

Personnel of the MAA-NLD responsible as per NLD-MAR-145.B.30 for the oversight of AMOs specified in paragraph B) and as per NLD-MAR-M.B.704 for the oversight of CAMOs specified in paragraph B).

Phase 1 + Phase 2 + Continuation training:

Personnel of the AMO required to plan, perform, supervise, inspect and certify the maintenance of aircraft and fuel system components specified in paragraph A).

Personnel of the CAMO involved in the management and review of the continuing airworthiness of aircraft specified in paragraph A).

D) General requirements of the training courses

Phase 1 – Awareness

The training should be carried out before the person starts to work without supervision but not later than 6 months after joining the AMO.

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Type: Should be an awareness course with the principal elements of the subject. It may take the form of a training bulletin, or other self-study or informative session. Signature of the reader is required to ensure that the person has passed the training.

Level: It should be a course at the level of familiarisation with the principal elements of the subject.

Objectives:

The trainee should, after the completion of the training:

1. Be familiar with the basic elements of the fuel tank safety issues.
2. Be able to give a simple description of the historical background and the elements requiring a safety consideration, using common words and showing examples of non-conformities.
3. Be able to use typical terms.

Content: The course should include:

- a short background showing examples of FTS accidents or incidents,
- the description of concept of fuel tank safety (and CDCCL if applicable),
- some examples of manufacturers documents showing CDCCL items (if applicable),
- typical examples of FTS defects,
- some examples of (Military) TC/ STC holders repair data,
- some examples of maintenance instructions for inspection.

Phase 2 – Detailed training

Type: Should be a more in-depth internal or external course. It should not take the form of a training bulletin, or other self-study. An examination should be required at the end, which should be in the form of a multi choice questionnaire, and the pass mark of the examination should be 75%.

Level: It should be a detailed course on the theoretical and practical elements of the subject.

The training may be made either:

- in appropriate facilities containing examples of components, systems and parts affected by FTS issues. The use of films, pictures and practical examples on FTS is recommended; or

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- by attending a distance course (e-learning or computer based training) including a film when such film meets the intent of the objectives and content here below. An e-learning or computer based training should meet the following criteria:

- A continuous evaluation process should ensure the effectiveness of the training and its relevance;
- Some questions at intermediate steps of the training should be proposed to ensure that the trainee is authorized to move to the next step;
- The content and results of examinations should be recorded;
- Access to an instructor in person or at distance should be possible in case support is needed.

A duration of 8 hours for phase 2 is an acceptable compliance.

When the course is provided in a classroom, the instructor should be very familiar with the data in Objectives and Guidelines. To be familiar, an instructor should have attended himself a similar course in a classroom and made additionally some lecture of related subjects.

Objectives:

The attendant should, after the completion of the training:

- have knowledge of the history of events related to FTS issues and the theoretical and practical elements of the subject, have an overview of all relevant requirements and/or regulations as defined by the MAA-NLD, be able to give a detailed description of the concept of fuel tank system Airworthiness Limitation Instructions (ALI) (including CDCCL if applicable), and using theoretical fundamentals and specific examples;
- have the capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner;
- have knowledge on how the above items affect the aircraft;
- be able to identify the components or parts or the aircraft subject to FTS from the manufacturer's documentation,
- be able to plan the action or apply a Service Bulletin, an AD or national equivalent.

Content: Following the guidelines described in paragraph E.

Continuation training

The AMO/CAMO should ensure that the continuation training is required in each two years period. The syllabus of the training programme referred to in 3.4 of the MOE or 0.3(e) of the CAME should include the additional syllabus for this continuation training.

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The continuation training may be combined with the phase 2 training in a classroom or at distance.

The continuing training should be updated when new instructions are issued which are related to the material, tools, documentation and manufacturer's or MAA-NLD's directives.

E) Guidelines for preparing the content of Phase 2 courses.

The following guidelines should be taken into consideration when the phase 2 training programme is being established:

- a) understanding of the background and the concept of FTS;
- b) how the mechanics can recognise, interpret and handle the improvements in the instruction for continuing airworthiness that have been made or are being made regarding the fuel tank system maintenance;
- c) awareness of any hazards especially when working on the fuel system, and when the Flammability Reduction System (FRS) using nitrogen is installed.

Paragraphs a) b) and c) above should be introduced in the training programme addressing the following issues:

- i) The theoretical background behind the risk of FTS: the explosions of mixtures of fuel and air, the behaviour of those mixtures in an aviation environment, the effects of temperature and pressure, energy needed for ignition etc., the 'fire triangle'.

Explain 2 concepts to prevent explosions:

- (1) ignition source prevention and
- (2) flammability reduction.

- ii) The major accidents related to fuel tank systems, the accident investigations and their conclusions.

- iii) ignition prevention program initiatives and goals, to identify unsafe conditions and to correct them, to systematically improve fuel tank maintenance.

- iv) Explain briefly the concepts that are being used: the results of Special Federal Aviation Regulation 88 (SFAR 88) of the Federal Aviation Administration (FAA), Joint Aviation Authorities Temporary Guidance Leaflet 47(JAA TGL 47), Joint Aviation Authorities Interim Policy Letter 25/12 (JAA INT/POL 25/12) and any other unique MAA-NLD initiatives: modifications, airworthiness limitations items and CDCCL (if applicable).

- v) Where relevant information can be found and how to use and interpret this information in the instructions for continuing airworthiness (aircraft maintenance manuals, component maintenance manuals, Service Bulletins...).

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vi) FTS during maintenance: fuel tank entry and exit procedures, clean working environment, what is meant by configuration control, wire separation, bonding of components etc.

vii) FRS when installed: reason for their presence, their effects, the hazards of an FRS using nitrogen for maintenance, safety precautions in maintenance/working with an FRS.

viii) Recording maintenance actions, recording measures and results of inspections.

The training should include a representative number of examples of defects and the associated repairs as required by the (Military) TC/STC holder's maintenance data.

F) Approval of training

For AMOs/CAMOs, the approval of the initial and continuation training programme and the content of the examination can be achieved through the MOE/CAME.

Appendix V to GM 145.A.67(a) Safety Management System Introduction

Background

1. Regulations are imposed on organisations with the aim of providing a minimum level of protection against hazards. However, the effectiveness of the regulatory intent is dependent on organisational, environmental and human factor influences present in the regulated organisations. Safety Management System (SMS) regulations enhance the traditional regulation set, by providing mechanisms by which these influences can be effectively assessed for safety implications and mitigated.

Rationale

2. Process regulation provides a minimum level of protection against hazards that threaten safety, with overall effectiveness limited by organisational, environmental and human factors. A SMS provides a higher level of safety by supporting and extending the protection afforded through process regulation alone.

Purpose

3. The purpose of an SMS is to provide organisations with a systematic, explicit, staged and comprehensive approach to managing risks to aviation safety, including the necessary organisational structures, accountabilities, policies and procedures. An effective SMS improves the likelihood of predicting, preventing and treating hazards, errors and violations by ensuring that SMS elements are present, suitable, operating and effective. In doing so, the SMS should be seen as a capability sustainment investment, not as an overhead.

SAFETY MANAGEMENT SYSTEM FRAMEWORK

4. NLD-MAR SMS requirements are derived from recommended practices published within the International Civil Aviation Organisation (ICAO) Annex 19 and Safety Management Manual (SMM, Doc 9859 third edition). These documents advocate SMS as a dynamic risk management system, aligning with Quality Management System (QMS) principles, in a structure scaled appropriately to the organisational risk, and applied in a safety culture environment.

5. Although the requirements of NLD-MAR SMS have been derived from ICAO's Safety Management Framework, the use of an ICAO based SMS is not mandated. Many similar systems may be utilized to achieve a similar scope and level of safety performance.

6. The structure of the GM and AMC for NLD-MAR SMS requirements is not a compulsory structure, however, it aligns with the 'ICAO Framework' and comprises four core components and 12 elements, as follows:

- a. Safety policy and objectives
 - i. Management commitment and responsibility
 - ii. Safety Accountabilities
 - iii. Appointment of key safety personnel
 - iv. Coordination of emergency response planning
 - v. SMS documentation.

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- b. Safety risk management
 - i. Hazard identification
 - ii. Safety risk assessment and mitigation.
- c. Safety assurance
 - i. Safety performance monitoring and measurement
 - ii. The management of change
 - iii. Continuous improvement of the SMS.
- d. Safety promotion
 - i. Training and education
 - ii. Safety communication.

7. The combination of safety risk management, safety assurance and safety promotion, as enacted by safety policy and objectives, supports the organisation to maintain a balance between capability and safety. These four components are discussed in greater detail in NLD-MAR GM 145.A.67(b).

8. For the aviation domain to progressively improve safety, many interfacing functions need to be considered as part of the broader SMS. These functions include operations, maintenance, design, production, airspace management, aerodrome services, and training development and delivery providers.

9. Organisations required to meet the outcomes of NLD-MAR SMS may (wholly or in part) leverage off a corporate safety management solution. If a corporate solution is used, it had to be referred to in the organisation's exposition. When using a corporate safety management solution, consideration needs to be given to ensure all requirements of NLD-MAR SMS are demonstrated.

SAFETY CULTURE

10. Safety culture reflects real commitment to safety at all levels and can be described as 'how' the organisation conducts its activities to ensure safety is considered in all cases. Simply put, the safety culture is the way safety is perceived, valued and prioritised. Practices that support the creation and nurturing of a positive safety culture evolve as the organisation continuously promotes safety as a core value. Although not directly regulated within the NLD-MAR SMS, an effective safety culture is essential for an SMS and any shortfalls will become apparent in the execution of the system.

11. Safety culture promotes a shared attitude of concern and responsibility, and is regarded as a fusion of the following desirable sub-cultures within an organisation:

- a. **Informed culture.** Staff are knowledgeable about the system (human, organizational and environmental factors) and what factors determine the level of safety.
- b. **Flexible culture.** Characterised by shifts from conventional 'hard-coded' hierarchies to flatter professional outcome-based structures, better pre-empting the need to adapt processes and objectives to suit changing organisational contexts.
- c. **Reporting culture.** Staff are willing to report hazards, errors and experiences, even when such reports may reflect poorly on their involvement. There is motivation to maintain a safe environment and the safety of their colleagues is considered the highest priority.

d. **Learning culture.** Staff have the will and competence to draw safety conclusions from information, and the will to implement corrective/preventive actions.

e. **Just and fair culture.** Staff are encouraged to reactively and proactively self-assess and generate safety-related information. A clear line exists between acceptable and unacceptable behaviour, i.e. individuals are both held responsible for their actions and treated fairly by the organisation.

12. In combination, the existence of the above-mentioned sub-cultures set the boundaries for acceptable behaviour and provides a framework for decision making. A positive safety culture should be pervasive across all SMS core components and place safety at the forefront of every task conducted. Organisations benefit from a positive safety culture through:

a. Greater integration of safety within all work practices over time.

b. Minimising the opportunity for human error, resulting in fewer accidents and incidents, reducing costs and increasing capability.

c. Increasing safety knowledge, and the consistency of that knowledge across all levels of the organisation.

d. Increasing motivation, trust and staff participation.

e. Helping to promote communication and positive attitudes towards safety throughout the organisation.

13. Safety culture maturity exists along a continuum that reflects the standard of safety performance possible in the organisation. Higher levels of safety performance can only exist with corresponding advancements in an organisation's safety culture.

SAFETY MANAGEMENT SYSTEM IMPLEMENTATION

14. Most organisations will possess some elements of an effective SMS due to their need to comply with civil or military airworthiness regulations or industry best-practice requirements. SMS implementation requires a gap analysis followed by an SMS implementation plan which may eventually evolve into your SMS documentation.

Size, nature and complexity considerations

15. Every organisation should ensure that its SMS is tailored for its organisational mission, size, nature, complexity and risk context. There is no 'one size fits all' SMS documentation set.

16. Where one or more organisations exist within a larger business group, each organisation may leverage off a single, corporate-level SMS. A dedicated department of the group may provide any or all of the safety management functions for all organisations under its umbrella.

17. Larger or more diverse organisations may need several safety management levels and/or safety committee structures to effectively focus on strategic as well as tactical safety issues. Conversely, small organisations may not need dedicated safety staff, instead relying on a number of employees to perform the multiple functions required. In very small organisations, maintaining independence in safety assurance functions may not be possible, in which case these functions could be conducted by other parties with the requisite competencies.

Gap analysis

18. Initially, a gap analysis should be conducted to compare the organisation's extant safety management processes with the requirements of the NLD-MAR SMS framework. The gap analysis enables organisation specific tailoring of the SMS implementation plan to suit the organisation's context.

Phased approach to SMS implementation

19. Following the gap analysis, a time-phased approach to SMS implementation could be utilised. The bigger the organisation and scope of activities, the longer the period required. A phased SMS implementation approach recognises that the implementation and sustainment of a fully mature SMS can only be achieved over successive years, permitting the SMS to gradually mature. It also recognises that continuous improvement of the SMS is not possible without corresponding advancement towards a 'generative safety culture'. Other benefits of a phased approach to SMS implementation include:

- a. The provision of a manageable series of steps to follow in implementing the SMS, including the allocation of resources.
- b. Effective balancing of workloads associated with SMS implementation against capability generation.
- c. Simpler reporting of SMS implementation progress.
- d. Sequencing of SMS implementation depending upon the organisation's current level of SMS maturity.
- e. Early availability of data and processes to support reactive, proactive and predictive safety risk management practices.

21. An example of a phased approach to SMS implementation is provided in Appendix VII to GM 145.A.67(b)1 and c - Example of phased SMS implementation. Note that the example provided is generic; each organisation should tailor their implementation to suit their own priorities. Deficiencies identified in the gap analysis assessment tool, often highlight where additional areas of improvement can be made.

INTEGRATION CONSIDERATIONS

22. The word 'integration' is used many times when discussing SMS, organisations and management systems. This section intends to clarify the NLD-MAR SMS requirements regarding 'integration' by discussing a number of interpretations.

23. An integrated SMS (sometimes referred to as 'vertical integration'). Organisations that are required to have an SMS should have each component and sub-elements within that SMS integrated. Simply put, each part of the system should work/interact/exchange information with other parts where applicable. An illustration of this at the component level is depicted below in figure 1.



Figure 1 - Integrated SMS (Vertical Integration)

24. Integrated management systems (sometimes referred to as ‘horizontal integration’). SMS is only one type of management system, and may be integrated with the functions of a number of other management systems, e.g. Occupational Health and Safety Management Systems (OHSMS), Quality Management Systems (QMS) and Security Management Systems (SeMS). Although considered a sign of a more mature SMS, the MAA-NLD does not require different management systems to be integrated with an organisation’s SMS. That said, the integration of management systems can provide consistency, robustness and many efficiencies. Some areas that organisations may integrate to seek efficiencies include, risk management and safety assurance activities. It should be noted that this form of integration is not mandated by NLD-MAR SMS requirements. An illustration of this form of integration is depicted below in figure 2.

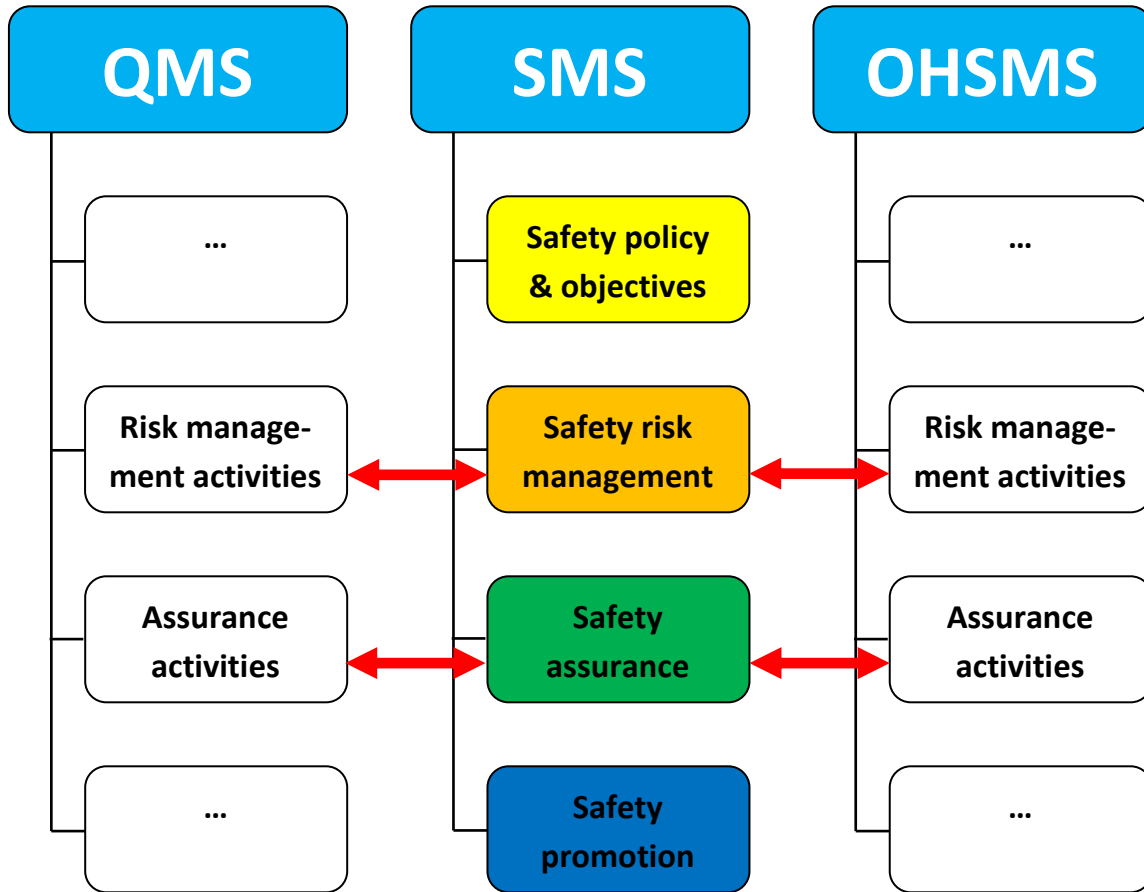


Figure 2 - Integrated Management Systems (Horizontal Integration)

25. Integration of NLD-MAR SMS requirements for numerous approvals; Organisations with a high degree of interdependency or that are operating with numerous NLD-MAR approvals, may find it beneficial to integrate their SMSs. This form of integration is currently only mandatory within the NLD-MAR SMS requirements construct for the Military Air Operator (MAO) and Continuing Airworthiness Management Organisation (CAMO) approvals. For other approvals this form of integration is voluntary.

PRODUCT, BEHAVIOUR AND PROCESS INTEGRITY CONCEPT

26. Designing management systems requires an understanding of how management decisions influence the end product. The Organisational Accident Model (OAM) is one method of visualising this relationship, another is the Bowtie model. By utilising the one of these methods, organisations can identify hazards specific to their operation not considered in regulations and standards. The resulting Bowties provide a method of communicating and visualising a variety of controls that have been identified to mitigate the risks imposed by these specific hazards.

27. An adaptation of the Bowtie model is that of the Product, Behaviour and Process (PBP) basic Bowtie, as shown below in figure 3. The real value of the high-level model of the PBP Bowtie is in its ability to provide a view of policy and processes and their interdependencies across three collective threat lines:

- a. **Product integrity.** The product/output/function satisfies a defined set of standards/requirements;
- b. **Behavioural (person) integrity.** The quality of a person, possessing and steadfastly adhering to high moral principles or professional standards; and
- c. **Process integrity.** An established set of actions to be followed to ensure a consistent outcome.

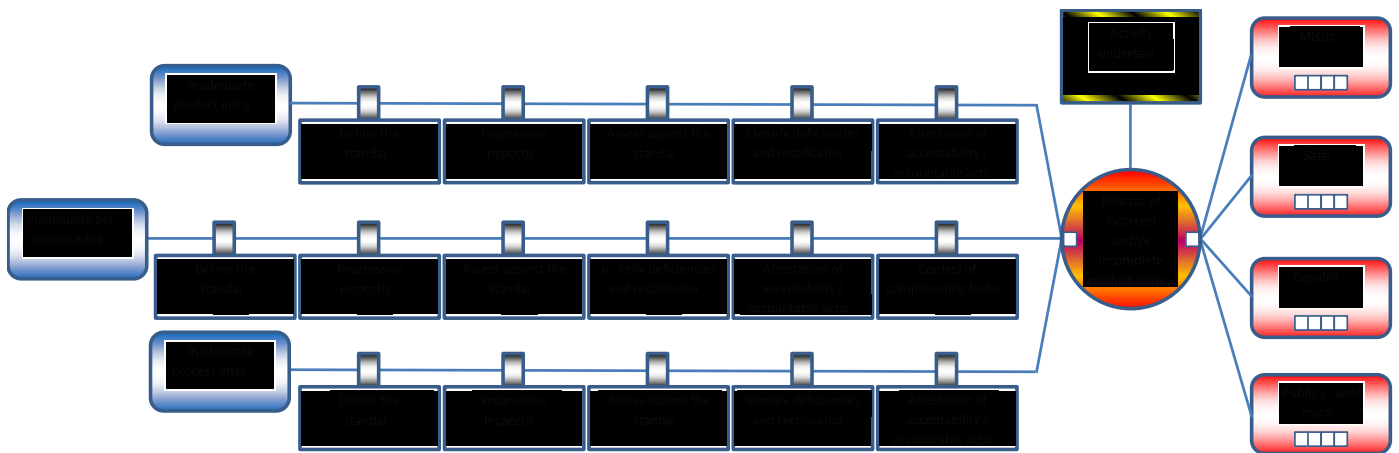


Figure 3 - Pictorial representation of the adapted Bowtie

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28. Placed along these threat lines are preventative controls, representing activities put in place to prevent the top event. Within the model there can be five distinct control types that are common for each of the threat lines. These control types are:

- a. Define the standard.
- b. Progressively inspect.
- c. Assess against the standard.
- d. Identify deficiencies and rectifications.
- e. Attestation of acceptability/accountable action.

29. On the behavioural integrity threat line, there is an additional control which is titled 'compounding factors'. These compounding factors can influence inactions on part of the person or group of persons which could ultimately affect the integrity of the product/output. Examples of these compounding factors are:

- a. **Human**, e.g. shift work, sleep, inconsistent mental application;
- b. **Environmental**, e.g. hot, cold, windy, wet, dark; and
- c. **Cultural**, e.g. deliberate non-conformance to procedures, caustic management, within the organisational domain.

30. From a risk management point of view the use of the Bowtie concept can be applied to most organisations and is particularly valuable in rationalising existing policies and procedures, and safety promotion, as it is easily understood.

31. Further information on the use of Bowties can be found in the first chapter of "10 Ways to Better Aviation Regulation 2nd Edition".

Appendix VI to AMC 145.A.67(b)1 and c - Safety Policy and Objectives

SAMPLE SAFETY POLICY STATEMENT

1. Safety is the first priority in all our activities. We are committed to implementing, developing and improving strategies, management systems and processes to ensure that all our aviation activities uphold the highest level of safety performance and meet national and international standards. In order to achieve this, our safety objectives are set down in this policy statement.

2. Our commitment is to:

- a. Develop and embed a safety culture in all our aviation activities that recognises the importance and value of effective aviation safety management and acknowledges at all times that safety is paramount;
- b. Clearly define for all staff their accountabilities and responsibilities for the development and delivery of aviation safety strategy and performance;
- c. Minimise the risks associated with aircraft operations so far as is reasonably practicable;
- d. Ensure that externally supplied systems and services that impact upon the safety of our operations meet appropriate safety standards;
- e. Actively develop and improve our safety processes;
- f. Comply with and, wherever possible, exceed legislative and regulatory requirements and standards, including but not necessarily limited to those mandated by the MAA-NLD and Ministry of Defence;
- g. Ensure that all staff are provided with adequate and appropriate aviation safety information and training, are competent in safety matters and are only allocated tasks commensurate with their skills;
- h. Ensure that sufficient skilled and trained resources are provided and available to manage safety and implement safety strategy and policy;
- i. Establish and measure our safety performance against realistic objectives and/or targets;
- j. Achieve the highest levels of safety standards and performance in all our aviation activities;
- k. Continually improve our safety performance levels;
- l. Conduct safety and management reviews and ensure that relevant action is taken;
- m. Actively encourage, promote, reward and give feedback in response to safety reporting amongst our staff; and
- n. Ensure that aviation safety is maximized through the application of an effective SMS, which is integral to all our aviation activities.

Appendix VII to GM 145.A.67(b1) and c - Phased SMS implementation

| Phased safety management system implementation | | | |
|--|---|--|---|
| PHASE 1 | PHASE 2 | PHASE 3 | PHASE 4 |
| Planning | SMS processes | Safety assurance | Enhanced risk management and safety assurance |
| <p>1. Implementation Planning:</p> <p>a) Identify the SMS Accountable Manager. b) Establish an SMS implementation team. c) Define the scope of the SMS. d) Perform an SMS gap analysis. e) Develop an SMS implementation plan.</p> | <p>1. Management commitment and responsibility:</p> <p>a) Establish the safety policy and objectives.</p> | <p>1. Safety performance monitoring:</p> <p>a) Establish a safety data collection and processing system for occurrence outcomes. b) Develop higher-consequence SPIs and associated targets and alert settings, and that provide predictive hazard management.</p> | <p>1. Management commitment and responsibility:</p> <p>a) Enhance the existing disciplinary procedure/ policy with due consideration of unintentional errors or mistakes from deliberate or gross violations.</p> |
| <p>2. Safety appointments:</p> <p>a) Establish a key person/office responsible for the administration and maintenance of the SMS.</p> | <p>2. Safety accountabilities:</p> <p>a) Define safety management responsibilities and accountabilities across relevant departments of the organisation. b) Establish an SMS/ safety coordination mechanism/ committees. c) Establish departmental/ divisional safety action groups where applicable.</p> | <p>2. Change management:</p> <p>a) Establish a 'management of change' procedure that includes proactive safety risk assessment.</p> | <p>2. Hazard identification:</p> <p>a) Integrate hazards identified from occurrence investigation reports with the voluntary hazard reporting system. b) Integrate hazard identification and risk management procedures with the subcontractor's or customer's SMS where applicable.</p> |
| <p>3. Training and education:</p> <p>a) Establish an SMS training programme for personnel, with priority for the SMS implementation team.</p> | <p>3. Emergency Response Planning:</p> <p>a) Develop an Emergency Response Plan (ERP).</p> | <p>3. Continuous improvement:</p> <p>a) Establish an internal quality audit programme. b) Establish an external quality audit programme.</p> | <p>3. Safety performance monitoring:</p> <p>a) Enhance the safety data collection and processing system to include lower-consequence events. b) Develop lower-consequence SPIs and associated targets/ alert settings, and that provide predictive hazard management.</p> |
| <p>4. Safety communication:</p> <p>a) Initiate SMS/safety communication channels.</p> | <p>4. SMS documentation:</p> <p>a) Initiate progressive development of SMS documentation and other supporting documentation.</p> | | <p>4. Continuous improvement:</p> <p>a) Establish SMS audit programmes or integrate them into existing internal and external audit programmes. b) Establish other SMS review/ survey programmes where appropriate.</p> |

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| Phased safety management system implementation | | | |
|---|--|-------------------------|---|
| PHASE 1 | PHASE 2 | PHASE 3 | PHASE 4 |
| Planning | SMS processes | Safety assurance | Enhanced risk management and safety assurance |
| | 5. Hazard identification: a) Establish a voluntary hazard reporting procedure. | | 5. Training and education: a) Ensure that the tailored SMS training programme for all unit personnel has been completed. |
| | 6. Safety risk management: a) Establish safety risk management procedures. | | 6. Safety communication: a) Promote safety information sharing and exchange internally and externally. |
| | 7. Safety performance monitoring: a) Establish occurrence reporting and investigation procedures. | | |

Appendix VIII to AMC 145.A.75(b) NLD-MAR Form 2a

NLD-MAR Form 2a is published on the MAA-NLD intranet and internet.