# NORWEGIAN DEFENSE MATERIEL AGENCY

**AMC & GM to Regulation for Norwegian Military Airworthiness**

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The regulation contains regulatory text. Text in BLUE BACKGROUND is either Acceptable Means of Compliance (AMC); or Guidance Material (GM).

Any AMC shall satisfy the regulation text. The regulation opens for alternative AMCs to those provided in this AMC GM document. However any such alternative AMCs must satisfy the regulation text, must be submitted to the NMAA for approval, and must be approved before any use.

## A. DEFINITIONS

Refer to European Military Airworthiness Document (EMAD) 1, Definitions and Acronyms, for definitions used in this regulation.

Refer to Appendix 3 for list of acronyms used in this document.

All references to European Military Airworthiness Requirements (EMAR) refer to the EMAR issue published as appendixes to this Regulation.

## B. INTRODUCTION

The Commanding Officer (CO) of NDMA ASD is the Norwegian National Military Airworthiness Authority (NMAA).

The NMAA assumes the role as technical airworthiness authority (TAA), partner airworthiness authority (PAA) and similar descriptions used in documents and publications the NDMA has adopted or acknowledged. Also, the NMAA assumes the role as Military Airworthiness Authority in EMAR.

### B.1 PURPOSE

In this regulation, the NMAA regulates both itself and other bodies. This regulation also provides guidance for higher authorities whenever such authorities make decisions that may affect the airworthiness of Norwegian Military Aircraft.

Any non-conformance to this regulation or to the AMC without an alternative AMC approved by the NMAA, could be a violation.

This regulation shall also be applied to by industry, through Norwegian Defence Sector units using this document as a contract appendix as is. When used as an appendix, this document is not legally binding per se, but a non-conformance to this regulation may constitute a violation of the contract, or will cause procured equipment to be unusable. It is therefore important that this document is made accessible to industry before any contract is signed.

This Regulation states how the NMAA will regulate and assess airworthiness of Norwegian Military Aircraft, as defined in EMAR.

This regulation provides instructions to organizations within the Norwegian Defense sector, as well as expected standards and contractual requirements to organizations outside the sector.

Airworthiness in this Regulation is a technical attribute, defined in EMAR as

"The ability of an aircraft or other airborne equipment or system, to operate in flight and on ground without significant hazard to aircrew, ground-crew, passengers (where relevant) or to other third parties."

Airworthiness is a part of materiel safety (Materiellsikkerhet). During the design phase, it is not a formal attribute, but is governed by risk. If the risk associated with operation is acceptable (see below), the type is (initial) airworthy, regardless of formal requirements, standards etc.

During management of continuing airworthiness (including maintenance), formal requirements and standards are used to ensure the continuing design level of risk.

This documents mandates compliance with EMAR 21. Compliance to EMAR 21 implies that the initial and continued airworthiness of an aircraft type is in accordance with any other compliances that the NMAA, the rest of the defence sector and the regulated community as such (the defence sector and its' industry partners) shall show, as referred to in other parts of the regulatory framework.

It provides an alternative means for flight release of aircraft which do not fully comply with an approved certification basis.

It enables NMAA acceptance of other civilian and military, certifications, evaluations, and inspections.

## B.2 SCOPE OF APPLICATION

Compliance with this Regulation is mandatory in the Norwegian Defence Sector.

An aircraft registered in Norwegian Defence Aircraft Register (NDAR) is subject to this regulation regardless of the nationality or organization of the pilot or other related personnel, and regardless of whether the flight is performed in a foreign country.

State Aircraft: This document does not regulate state aircraft. However, the rules for State Aircraft may be somewhat unclear and may be subject to review and change. Therefore, whenever an aircraft on civilian registration is operated within the NDS as state aircraft for more than two consecutive flights, the NMAA should notify the Norwegian CAA technical department to clarify responsibilities and agree upon code of conduct.

Foreign military aircraft operating in Norwegian airspace as part of exercises or other approved duties are not affected by this regulation.

All units and/or organisations within the Norwegian defense sector are required to enforce that any non- defense sector -organisations or persons that design, build, maintain, repair, modify, procure, supply, operate, or in any other way perform activities that may affect the airworthiness of, Norwegian Military Aircraft, adhere to this Regulation.

Failure to adhere to this Regulation could potentially render any contract null and void, or prohibit use of any procured equipment. Refer to APPENDIX 3, AIRWORTHINESS REQUIREMENTS FOR PROCUREMENT.

Operational aspects are not included in this regulation. All operational aspects including operational risk are within the authority of the Military Aviation Authority[1] (MAA).

Ground Support Equipment (GSE) not included in EMAR, Ground Based Air Defence (GBAD) systems and other ground based equipment for which CO ASD is responsible, are not included in this Regulation. The rules applicable to such equipment are provided in Regulation for Ground Based Air Materiel Management.

### B.3 RELATION TO OTHER DIRECTIVES AND REGULATIONS

This Regulation is subordinate to the policies of the Norwegian Ministry of Defence (MoD) for procurement, materiel and logistics[2], in addition to the regulations concerning airworthiness of Norwegian military aircraft as defined by the MAA[3].

This document shall take precedence over any other directive or regulation (Bestemmelse) than those listed above.

> Due to ongoing revisions, any given regulations may not fully correspond at any given point in time. Whenever non-conformance is discovered, this regulation applies. Please report any such findings to the NDMA Air Systems Division iaw procedures described below.

The Policies and Directive define materiel safety and assign the materiel authority (fagmyndighet materiell). For military airworthiness, these terms are separated into two parts, one where the NMAA regulates and enforces airworthiness, and one where the materiel authority regulates military materiel categories beyond aircraft.

For further information, refer to Fig. 1.

[1] Militær Luftfartsmyndighet.

[2] Retningslinjer for Fremskaffelse av materielle kapasiteter i forsvarssektoren, Retningslinjer for Materiellsikkerhet i forsvarsektoren, Retningslinjer for Materiellforvaltning i forsvarsektoren, Retningslinjer for Logistikkvirksomheten i forsvarssektoren.

[3] Bestemmelser for militær luftfart (Provision for military aviation).

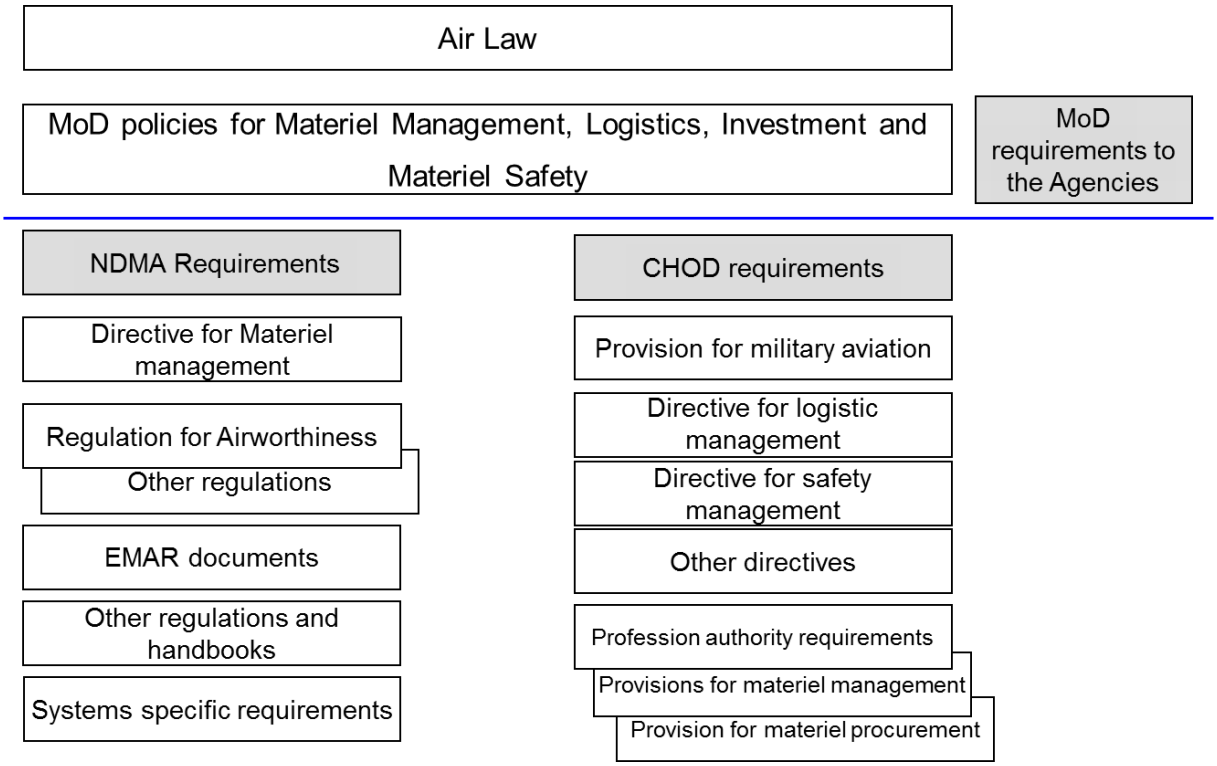


Fig 1, the relationship between defence sector documents affecting airworthiness.

### B.3.1 FITNESS FOR PURPOSE

Fitness for purpose is not a part of airworthiness. The primary reference for technical fitness for purpose (FFP) evaluation shall be USAF AFMCI 63-1201 Attachment 3, Operational Safety Suitability and Effectiveness (OSS&E).

The processes and documents related to FFP evaluation shall be sufficiently separated from those used to evaluate airworthiness to enable separate approvals/certifications.

The airworthiness process follows strict procedures to ensure that criteria are complied with. This approach will not always be cost-effective for FFP (example: repeated testing to ensure not only whether a system works, but also its Mean Time Between Failure, MTBF).

Secondly, the airworthiness process is solely focused on the certification basis, which carries some, but generally limited information on FFP.

Thirdly, the airworthiness process uses risk assessment as the primary tool for determining whether a type is airworthy. An FFP evaluation may need to use other and different assessment methods that are not allowable to use for determining airworthiness.

The operational user (Brukeransvarlig) should provide statement of operating intent guidance and scope of the FFP evaluation[4].

An initial qualification shall be performed at initiation of OT&E or equivalent to a sufficient extent to initiate such activity. A full mission qualification shall be performed after a suitable OT&E, or when needed by the user.

### B.3.2 DECOMMISSIONING AND DISPOSAL

Any part or appliance that is scrapped or otherwise permanently withdrawn from service, shall be clearly and physically marked in order to safeguard against unintended or illegal use.

[4]HFL 100-90, Regulation for Operational test and evaluation in the Air Force/Reglement for Operativ test og evaluering i Luftforsvaret.

Aircraft are normally subject to specific end user agreements, which limit Decommissioning and Disposal including potential buyers. Any end user agreements shall be closely observed during.

## C. GENERAL

Organizations within the defense sector shall develop procedures to ensure that the objectives of this regulation are fulfilled.

### C.1 NORWEGIAN DEFENSE SECTOR AIRCRAFT REGISTER

The rules and provisions concerning the register are provided in *Bestemmelser for militært luftfartøysregister*.

The NMAA maintains the Norwegian defense sector aircraft register[5] (NDAR) comprising all Norwegian military aircraft.

> Any aircraft carrying Norwegian military marking (*ref TO-1-1-5004-1*) should be in the NDAR unless the marking is applied to a historic aircraft (iaw NMAA guidelines) and the aircraft is de facto in another register.
>
> Any aircraft, manned or unmanned, owned, leased and/or operated by organizational components of the Norwegian Defence Sector (NDS) should be in the NDAR unless being in a civilian register or an NMAA-recognized military register.

### C.2 AIRWORTHINESS RISK ACCEPTANCE

Allowable risk levels for Norwegian military aircraft are provided in *BFL 010-1 Bestemmelser om sikkerhetsstyring i Luftforsvaret*.

Airworthiness risk within the accepted risk level can be accepted by NMAA level 1 or higher.

Airworthiness risk up to and including medium shall be accepted by NMAA level 2 or higher.

Airworthiness risk above medium shall be accepted by NMAA level 3 or higher.

1. Refer to Appendix Where applicable, issue and maintain MCA for each individual aircraft in the type design, provided the aircraft is in compliance with the MTC and is in a condition that allows operation within accepted risk levels.
2. Approve or reject organizations outside the Norwegian defense sector intending to perform work on Norwegian military aircraft.
3. Approve or reject organizations outside the Norwegian defense sector intending to supply part for Norwegian military aircraft.

A.1.2 AIRWORTHINESS RISK ACCEPTANCE for assignments of level 1, 2 and 3 to organizational elements.

## D. INITIAL AND CONTINUED AIRWORTHINESS

EMAR 21 shall be the basis for initial and continued airworthiness of Norwegian military aircraft. The NMAA will comply with EMAR 21 section B.

### D.1 DEVIATIONS

When a Military Type Certificate (MTC) applicant or Design Authority (DA) cannot show compliance to the certification basis, the requirements laid out in EMAR 21 shall be adhered to.

When a Military Type Certificate (MTC) applicant or Design Authority (DA) cannot show compliance to other requirements, the NMAA shall require appropriate corrective actions to be taken from the applicant/DA or other stakeholder that can mitigate risk, to ensure that all requirements are sufficiently met and that any non-compliance is within acceptable total risk.

[5] Retningslinjer for Materiellsikkerhet i forsvarsektoren (RMS), para 2.3

The applicant/DA may suggest equivalent acceptable means of compliance, subject to approval by the NMAA.

Action shall be taken by the NMAA to suspend, in whole or in part, the approval in case of failure to comply within the requirements.

## D.2 AIRWORTHINESS ASSESSMENT

All aircraft/air system types in NDAR shall be subject to a completed airworthiness assessment. For in-service types designated as legacy, separate procedures apply, see D.4 LEGACY AIRCRAFT.

DODD 5030.61 states: "all aircraft and air systems owned, leased, operated, used, designed or modified by DoD must have completed an airworthiness assessment".

This is a good guideline also for NDS.

The approved Airworthiness Assessment shall result in the issuance of an MTC, or may result in a Military Permit to Fly (MPF) for aircraft for which the issuance of a MTC is not appropriate[6].

The issuance of MTC may not be appropriate based upon the risk related to flying the type, or based upon any of the formal requirements that apply. Even if the formal requirements (documentation etc) are fulfilled, an MTC shall never be issued if the actual or calculated/probable risk is higher than the acceptable risk levels.

Some acceptable risk levels are:

$10^{-4}$ FHR total risk, fighter type aircraft ($2,5^{-4}$ FHR total risk for F-35)

$10^{-6}$ FHR for loss of life

$10^{-6}$ FHR for loss of aircraft, average of all aircraft types

$10^{-7}$ FHR for structural failure, average of all aircraft types

$10^{-9}$ FHR for single catastrophic failure, average of all aircraft types

Any risks higher than this must be approved by NMAA management.

The NMAA shall formally inform the user of any known or suspected risk above the acceptable risk levels before any flight with the applicable type.

Only the NMAA can validate an MTC or MPF for Norwegian military aircraft. Validation shall normally be based upon an MTC or Type Certificate (TC) from a recognized foreign Military Airworthiness Authority, see FOREIGN MILITARY AIRWORTHINESS CERTIFICATION.

Unless otherwise agreed with the NMAA, the Design Organization of the aircraft Type (Design Authority, Original Equipment Manufacturer or similar) shall be the MTC Holder.

## D.3 SAFETY APPROVAL AND ADMINISTRATIVE APPROVAL OF AIRCRAFT

A full safety and administrative approval shall only be performed on a system level (ie a new aircraft type).

On an exceptional basis, a full, new approval may be performed whenever a major significant modification affects the airworthiness of multiple systems (i.e. mid-life update with combined major avionics and structural modifications).

[6] EMAR 21 Subpart B

Subsequent changes and supplements shall, beyond the MTC, trigger an appropriate update or change to the existing approval.

> Example: a new radio in an existing aircraft. In this case, the existing approval will be updated, as required to ensure the safety of the new configuration. This will always include MTC (supplement), configuration documents and AMP.
>
> A minor, non-significant change, may be documented only as an update to the parts catalog.

The airworthiness artifacts listed will, when combined, constitute the safety approval and administrative approval for a new air system:

1. An MTC or an MPF.

> All requirements for issuing either an MPF or an MTC must be fulfilled before any safety approval can be issued. The MTC or MPF shall be issued as a part of the safety approval, and not later than this.
>
> Safety approval and administrative approval is mandated through the RMS, and is not an EMAR airworthiness process. However, the processes overlap and shall be combined as stated.

The validated MTC including its substantiating documentation (including risk assessment) shall constitute the Materiel Safety Approval[7].

2. A Military Certificate of Airworthiness (MCA) or equivalent document or enterprise resource planning (ERP) entry.

The MCA or equivalent shall constitute the Military Airworthiness Attestation[8].

3. A Continued Airworthiness Management Exposition (CAME)[9].
4. A Maintenance Organization Exposition (MOE)[10].
5. A document describing the planned usage of the materiel[11], referring to the CAME.

### D.3.1 CRITERIAS FOR INITIAL ISSUE AND REVISION OF THE APPROVAL

A full safety and administrative approval shall only be performed on a system level (ie a new aircraft type).

Subsequent changes and supplements shall, beyond the MTC, trigger an appropriate update or change to the existing approval.

## D.4 LEGACY AIRCRAFT

Those aircraft registered in NDAR and in full service before 1st of January 2016 are designated as legacy aircraft.

> Any Aircraft Type introduced into regular service before 1 January 2016; and that does not have any type of flight clearance issued based upon known and recognized Certification Criteria; and/or does not have a Military Type Certificate (MTC) issued by a recognized Airworthiness Authority, is a Legacy System.

[7] RMS para 8.2
[8] BML para 2.3.1, Krav til luftdyktighet (Airworthiness Requirements)
[9] EMAR M.A.704
[10] EMAR 145.A.70
[11] Materielldriftsplan (MDP)

Whenever legacy aircraft are undertaking any major modification, the NMAA will perform an airworthiness assessment and decide on a case to case basis whether the type shall be recertified. As a minimum, a valid Airworthiness Review must be in place.

> Airworthiness Review is here used in a different context than the original intention in EMAR M. Here, the Airworthiness Review is used as a risk reducing action.

## E. CONTINUING AIRWORTHINESS

Continuing Airworthiness within the Norwegian Defense sector shall be managed iaw EMAR M. For EMAR transition periods, refer to APPENDIX 2, EMAR IMPLEMENTATION SCHEDULE PER AIRCRAFT TYPE.

Legacy types shall be managed iaw BMF/L 750-1. The management organization may apply to the NMAA for managing legacy types iaw EMAR M.

> Continuing airworthiness includes both type airworthiness (as documented through the MTC), and individual airworthiness, as documented through the MCA or MPF, and the maintenance records.
>
> The MCA may be embedded into the applicable NMAA-approved ERP computer system.

Airworthiness activities shall be performed iaw the applicable NMAA requirements, i.e., but not limited to, TO 00-20-5000-series.

Changes, modifications (continued airworthiness) and flight releases shall be managed iaw EMAR 21.

Aircraft maintenance within the Norwegian defense sector shall be managed iaw EMAR 145. For detailed EMAR transition periods, refer to APPENDIX 2, EMAR IMPLEMENTATION SCHEDULE PER AIRCRAFT TYPE.

Legacy types shall be managed iaw BMF/L 750-1. The maintenance organization may apply to the NMAA for managing the maintenance of legacy types iaw EMAR 145.

Training and authorization of technical personnel within the Norwegian defense sector shall be managed iaw Regulation for technical training (RFK Luft). Technical training organizations shall have an MTOE iaw EMAR 147.

Continuing Airworthiness performed outside the Norwegian defense sector shall be managed iaw EMAR M and EMAR 145. Refer to Regulation for approved aircraft parts for detailed requirements for parts and maintenance providers.

> Whenever Norwegian Military Aircraft are maintained or operated iaw foreign military rules, the NMAA is the authority and shall be granted access to any airworthiness artifact, organization or person for audits, revision, counseling and any means of oversight, control etc that the NMAA sees fit and that is within the scope of an airworthiness authority. The NMAA can invite any other party to any such activity, but must ensure that the invited party is eligible to entry and information sharing.
>
> Note that Initial and Continued Airworthiness managed iaw USAF AFI 62-601; and Continuing Airworthiness managed iaw USAF AFI 21-101, is normally approved, with the condition that NMAA does not accept self-regulation. Therefore, audits must be performed, either by the NMAA or an organization recognized by the NMAA.

Any CAME or MOE relating to Norwegian military aircraft is subject to approval by the NMAA.

Operational use of aircraft registered in NDAR is governed by the MAA through BML.

## E.1 DEVIATIONS

When a maintenance organization or CAMO cannot show compliance to the requirements, the NMAA shall require appropriate corrective actions to be taken to ensure all requirements are sufficiently met. The maintenance organization or CAMO may suggest equivalent acceptable means of compliance, subject to approval by the NMAA.

Action shall be taken by the NMAA to suspend, in whole or in part, the approval in case of failure to comply within the requirements.

# F. FOREIGN MILITARY AIRWORTHINESS CERTIFICATION

## F.1 GENERAL

A foreign nation's military airworthiness approval may be accepted as a basis for NMAA certification.

The foreign nation's airworthiness approval process shall be examined, approved and recognized by the NMAA following the standards of European Military Airworthiness Document – Recognition (EMAD R).

Recognized in this context means that the NMAA has found the applicable organization to sufficiently comply with any requirement within EMAR that is relevant to the applicable scope. Further, that the NMAA will trust the applicable output(s) from that organization as specifieid in the individual Certificate of Recogniton.

If an organization initially is found not to show such compliance, the NMAA is free to

1. Terminate the recognition effort
2. Provide a grace period followed by a reattempt
3. Adjust the scope/task so that the organization complies with the new scope.
    a. In this case, the NMAA will find alternative solutions to necessary activities/requirements falling outside the original scope.

Refer to EMAD R for further information.

After a recognition, the NMAA shall perform audits of the procedures and processes of the recognized organization and its' regulated community

Utilization of a NMAA-approved, foreign airworthiness authority's approval as a basis for Norwegian Military airworthiness approval is permissible provided the flight profile, operating environment, and continuous airworthiness program as approved for that aircraft and the air system is similar to the intended usage of NDS. Any gaps between the intended usage of the foreign certification approval and the NDS intended usage must be assessed and is subject to approval by the NMAA.

"As a basis" means that the NMAA, based upon findings during recognition, prior performance and level of confidence, may approve the artifacts and/or processes without any further action, or the NMAA may choose to verify the artifact or process.

The NMAA determines its own level of control.

The NMAA shall assess any gaps between the intended usage of the foreign approval and the Norwegian defense sector intended usage[12] and ensure that any residual risk is within acceptable limits.

### F.2 RECOGNITION OF OTHER NATIONAL MILITARY AIRWORTHINESS AUTHORITIES

The NMAA may recognize a foreign airworthiness authority to perform any part of an airworthiness approval process, short of validating an MTC or issuing an MPF. EMAD R shall be the basis for such recognition.

### F.3 NORWEGIAN DEFENSE SECTOR ACCEPTANCE OF CIVILIAN OR FOREIGN MILITARY CERTIFICATIONS, EVALUATIONS AND INSPECTIONS

The basis for airworthiness certification shall be validated by and be subject to approval by the NMAA. The basis for certification shall be the original certification from the primary certifying authority.

> The existing EASA, FAA or other (typically foreign military) certification shall be used as the certification basis for issuing the Norwegian MTC. The NDMA shall not introduce any other certification basis, unless certification basis is missing for certain types of equipment (i e is not certified for the applicable use).
>
> Any ambiguities between the existing certification and the Norwegian Military requirements (usage spectrum, statement of operating intent, additional requirements etc), shall be handled through an MTC Change or Supplement.

The Type Certificate (TC or MTC) or equivalent artefact shall be validated by the NMAA.

For any items not included in the original TC, an NMAA-approved basis for certification shall be used to define military airworthiness certification criteria, standards, and methods of compliance. Normally, this should be either European Military Airworthiness Certification Criteria (EMACC) or the original basis for certification.

> Note that the civilian CS (23, 25, 27 and 29) is incorporated and cross referenced in EMACC. MIL-HDBK-516 is not currently incorporated into EMACC. Due to the impracticalities connected with using several certification bases, MIL-HDBK-516 should not be the primary choice of certification basis for a Norwegian MTC supplement or change, and should not be used unless
>
> 1. The original certification Basis for the type is MIL-HDBK-516, and
> 2. The Applicant has prior experience in tailoring a MIL-HDBK-516-based MACC.

## G. MODIFICATIONS OR REPAIRS WHERE NDMA TECHNICAL DEPARTMENT IS DESIGN AUTHORITY

Whenever a modification or repair is initiated, a capable engineering organisation representative shall personally be designated Head of Design. Allowable provisions are listed in APPENDIX 1 ROLES AND RESPONSIBILITIES. The head of design is responsible for performing the duties of the applicant as well as ensuring conformity of the modification or repair.

[12] Refer to DoDD 5030.61, May 24, 2013, ENCLOSURE 3, Change 1, 06/25/2015

"Applicant" in this case refers to any personnel (primarily within the NDMA ASD) assigned to perform duties within the scope of an applicant for an MTC change or supplement (design organization), as described in EMAR 21.

Only personnel that has not been part of modification design are allowed to engineering support to the NMAA during such cases.

The requirements in EMAR 21 Subpart B; D; E and M, as applicable, shall be adhered to for such modifications or repairs.

All modifications shall have airworthiness criteria documented through a Modification Airworthiness Certification Criteria (MACC) or equivalent compliance document, along with the prescribed substantiating documents. The Head of Design shall classify the modification as "Minor" or "Major" [13], and submit "Minor" modifications to the ASD Technical Director for approval, and "Major" modifications to the NMAA.

The ASD Technical Director shall be applicant[14] and supplemental MTC (sMTC) holder with the duties and responsibilities as Design Organization[15].

The responsibilities as Design Organization include instructions for continuing airworthiness. All necessary documentation shall be developed and approved by the NMAA before any MPF or MTC supplement or change will be released.

## H. FLYING WITH UN-AIRWORTHY AIRCRAFT

Whenever an operational emergency that involves clearance to fly with aircraft that is un-airworthy (ie. where the airworthiness risk may exceed the acceptable risk level), the following shall apply[16]:

The authority that orders such flying shall assume full responsibility for all risks involved, including risk to life.

The authority that orders such flying shall assume full responsibility for any additional expense of returning the aircraft to airworthy status after end of operations.

The NMAA shall without delay be informed about flying with un-airworthy aircraft, and may advise risk mitigating actions for airworthiness risks. The NMAA will inform the user of known risk related to the flight(s).

After completion of the applicable flight/operation/campaign, the aircraft shall be deemed non-operational until the NMAA declares that the risk of continued operations is within acceptable levels, and the NMAA is ready to assume such risk.

Non-emergency cases where the NMAA concludes that the risk is within acceptable levels (if necessary after prescribing risk mitigating actions) should be authorized by the NMAA through an MPF including conditions and limitations.

Guidance material can be found in UK MoD RA 1330 - Special Clearances.

The NDMA shall be prepared to approve flying with aircraft if an operational emergency is declared, and the applicable aircraft is un-airworthy due to formal issues, but where the risk of flying is known and within the acceptable levels.

Certain specific conditions may be approved iaw TO-00-20-5001 para 1.7.

[13] EMAR 21.A.95, 21.A.97, Appendix A to GM 21A.91, AMC No. 1 to 21A.263(c)(1)
[14] EMAR 21.1 General
[15] EMAR 21 Subpart E
[16] Retningslinjer for Materiellsikkerhet para 9.6

# I. UNMANNED AIRCRAFT

Also referred to as Remotely piloted air systems (RPAS) or unmanned air/aerial vehicle (UAV).

For airworthiness purposes, unmanned aircraft are classified iaw civilian rules (Bestemmelser for Sivil Luftfart, BSL). Note that the BML contains a different classification.

**Remotely Operated 1 (RO 1) max take-off mass (MTOM) below 2,5kg, max speed 60 kts**

RO 1 is exempt from aircraft registration. The system shall have NMAA-approved technical documentation and a NMAA-approved maintenance plan as per the manufacturer's prescription.

RO1 is not subject to any specific airworthiness requirement, as the risk and consequences connected with a fault already is within acceptable limits.

**RO 2 MTOM below 25kg, max speed 80 kts**

In addition to those requirements as for RO 1, the system shall be airworthy. The airworthiness of the design and the control system, and the verification basis and plan for continuing airworthiness shall be documented, and approved by the NMAA.

**RO 3 MTOM above 25kg, max speed above 80 kts**

The system shall satisfy all airworthiness requirements iaw EMAR 21 or STANAG 4671or equivalent.

## I.1 AIRWORTHINESS REQUIREMENTS OF BFL AND BSL CLASSIFICATIONS

Table 1, RO Classes and airworthiness requirements related to the classes.

<table>
<tr><th>BFL class</th><th>BSL/RML Class</th><th>BFL airworthiness requirements</th><th>BSL/RML airworthiness requirements</th><th>STANAG 4671</th></tr>
<tr><td>Class 0<br>below 60g</td><td rowspan="2">RO1<br>below 2,5kg</td><td>No approval required</td><td rowspan="2">Technical documentation and a NMAA-approved maintenance plan</td><td rowspan="4">Could be used</td></tr>
<tr><td>Class 1A<br>60g-10kg</td><td rowspan="3">Simplified safety approval</td></tr>
<tr><td rowspan="2">RO2<br>2,5-25kg</td></tr>
<tr><td>Class 1B<br>10-25kg</td><td rowspan="2">Airworthiness requirements for initial airworthiness, and control system. Plan for continuing airworthiness.</td></tr>
<tr><td>Class 1C<br>25-150kg</td><td rowspan="2">RO3<br>above 25kg</td><td>Simplified safety approval or military airworthiness certification</td><td rowspan="2">Military airworthiness certification</td></tr>
<tr><td>Class 2/3<br>above 150kg</td><td>Military airworthiness certification iaw NATO standards</td><td>Should be used</td></tr>
</table>

## I.2 SIMPLIFIED SAFETY APPROVAL OF TARGET DRONES

Approval of unmanned target drones otherwise classified as RO2 and RO3, can be performed according to a simplified materiel safety approval, refer to APPENDIX 4, TAILORED SIMPLIFIED SAFETY APPROVAL PROCESS FOR UNMANNED TARGET DRONES.

## I.3 ARMED UNMANNED AIRCRAFT

Reserved for future use.

## J. EFFECTIVE DATE

The document is effective 2017-03-08.

## K. REQUEST FOR REVISIONS OR CHANGES

Request for revisions or changes shall be forwarded to the NDMA Air Systems Division as a Technical Manual Change Recommendation, AFTO Form 22[17].

[17] AFTO Form 22 may be found at http://www.e-publishing.af.mil/?txtSearchWord=afto22&client=AFPW_EPubs&proxystylesheet=AFPW_EPubs&ie=UTF-8&oe=UTF-8&output=xml_no_dtd&site=AFPW_EPubs

## APPENDIX 1 ROLES AND RESPONSIBILITIES

### A.1.1 NMAA RESPONSIBILITIES

The NMAA organisation shall for each new air system or a major modification to an existing air system

1. Provide technical requirements for initial, continued and continuing airworthiness of all contracts issued on behalf of the defence sector.
2. Ensure that a Tailored Airworthiness Certification Criteria compliance document (TACC or equivalent) has been developed before any equipment is delivered or any modification is initiated.

If such a document has not been developed, the acquisition program shall be suspended until the document has been delivered to the NMAA.

3. Approve or reject the TACC and the Certification Program Plan.
4. Assess and approve or reject the residual risk for all certification criteria where the type is non-compliant. This shall include, but is not limited to
    a. Means of Compliance
    b. Means of Evidence and the resulting Evidence
    c. Mitigations for any non-compliances
    d. Instructions for continuing airworthiness
    e. Any residual risk.
5. Validate the MTC when the system fulfills the requirements regulated in EMAR 21.
6. If the type is eligible, issue an MPF if the requirements for issuing an MTC are not satisfied.
7. Enter each individual aircraft into the NDAR.

Further, the NMAA will at all times;

4. Where applicable, issue and maintain MCA for each individual aircraft in the type design, provided the aircraft is in compliance with the MTC and is in a condition that allows operation within accepted risk levels.
5. Approve or reject organizations outside the Norwegian defense sector intending to perform work on Norwegian military aircraft.
6. Approve or reject organizations outside the Norwegian defense sector intending to supply part for Norwegian military aircraft.

### A.1.2 AIRWORTHINESS RISK ACCEPTANCE

Refer to table 3 for which positions within the NDMA/ASD that have the authority to accept the listed airworthiness risk levels.

| Airworthiness Risk Level | NMAA level | Position |
|---|---|---|
| GREEN/LOW | 1 | ASD head of section |
| YELLOW, ORANGE (MEDIUM) | 2 | ASD Technical Director |
| RED (HIGH) | 3 | ASD Commanding Officer |

*Table 3, Risk Acceptance Authority.*

The NMAA will inform the user of any known risk higher than the acceptable risk.

## APPENDIX 2, EMAR IMPLEMENTATION SCHEDULE PER AIRCRAFT TYPE

NOTE that this schedule is subject to change more frequent than the basic regulation.

| Aircraft type | EMAR Implementation schedule | Comments |
|---|---|---|
| AW101-612 | As of 27 Nov 2017 | Implemented, but with temporarily accepted non-compliances regarding EMAR66 type training and licensing, EMAR 147 training organisation, and EMAR M CAMO organisation |
| NH90 NNWN | Within 2021 | Subject to change iaw EMAR implementation plan |
| F-35A | Maintenance organisation compliance to EMAR 145 iaw F-35 Program Directive 1501-01.03 | EMAR 145-equivalence only. Other EMAR elements iaw EMAR implementation plan. |
| P-8 | 30 days prior to first individual registered in NDAR | |

## APPENDIX 3, AIRWORTHINESS REQUIREMENTS FOR PROCUREMENT

### A3.1 GENERAL

This Appendix shall be part of air system procurement and modification contracts.

It is the responsibility of the project manager to ensure that the requirements in this regulation, including this appendix, are implemented in the contracts with suppliers and contractors.

EMAR shall be the basis for airworthiness of Norwegian Military Aircraft. If the legacy of the applicable Aircraft Type does not allow full compliance with EMAR, due diligence to EMAR shall be taken to the maximum extent.

New aircraft types registered into the NDAR after 1st of January 2016 must have a Military Type Certificate[18] or a Military Permit to Fly[19] issued in order to be airworthy. The Project Manager shall facilitate the activities necessary to issue such documents.

### A3.2 AIRWORTHINESS

All Aircraft Types shall have completed an airworthiness assessment iaw DoDD 5030.61[20] and/or EMAR 21 before operational use or OT&E can commence, or the closest commercial milestone.

The airworthiness assessment should use either EMACC; MIL Handbook 516; or civilian EASA/FAR Part 23, 25, 27 or 29; to define applicable military airworthiness certification criteria, standards, and methods of compliance. If required, the NMAA may approve other airworthiness certification criteria.

An aircraft Type which is already certified: Norway will pursue recognition of the (Military) Airworthiness Authority responsible for the initial certification of the Type through EMAD R, and subsequently validate airworthiness documentation from that authority. The certification basis shall be the original certification from the primary certifying authority.

A Tailored Airworthiness Certification Criteria compliance document (TACC or equivalent) shall have been developed before any equipment is delivered.

Parts and installations not covered by the original Military Type Certificate (MTC) or Type Certificate (TC) should be certified through a Supplemental Military Type Certificate (SMTC) iaw AFI 62-601 and/or EMAR 21, or as deemed equivalent by the NMAA.

The Design Organization of the aircraft Type shall be the MTC Holder with responsibility for continuing airworthiness as required in EMAR21.

[18] EMAR 21 or AFI62-601
[19] EMAR 21; Permit to Fly is Equivalent to Military Flight Release ref AFI62-601.
[20] US Department of Defence Directive.

The Design Organization shall be identified towards the NMAA and may be an organization with EMAR/EASA/FAR 21 Design Organization Approval (DOA), or the Original Equipment Manufacturer (OEM), or the Prime Contractor, or a government Program Office (coordinating Design Organization), or as deemed equivalent by the NMAA.

**NOTE**

**For specific aircraft types, additional requirements may apply.**

**This list does not cover requirements related to mission qualification/fitness for purpose, or safety requirements related to particular usage.**

**Any artifacts required must be released to the NMAA minimum 90 days prior to entry into Norwegian register.**

Table 2, airworthiness requirements for procurements.

| Requirement | Artifact required | Comments | Regulation reference |
|---|---|---|---|
| The type shall have a completed airworthiness assessment iaw DoDD 5030.61 and/or EMAR 21. | Military type Certificate or equivalent document, including recommendation. (USN Flight Clearance or NATOPS). Including interim equivalents (Military Permit to Fly, Military Flight Release, interim Flight Clearance) | This shall be completed before operational use or OT&E can commence, or the closest commercial milestone.<br><br>NOTE normally, this airworthiness assessment shall be performed by the original certifying authority. | RML<br>The airworthiness assessment should use either EMACC; MIL Handbook 516; or civilian EASA/FAR Part 23, 25, 27 or 29; to define applicable military airworthiness certification criteria, standards, and methods of compliance.<br>If required, the NMAA may approve other airworthiness certification criteria. |
| An aircraft Type which is already certified: Norway will pursue recognition of the (Military) Airworthiness Authority responsible for the initial certification of the Type through EMAD R, and subsequently validate airworthiness documentation from that authority. | | Authority to authority recognition is not a project activity. The NMAA decides whether recognition shall be coordinated with the timeline of a specific acquisition project.<br><br>The NMAA will not recertify artifacts from a recognized authority, such artifacts will be subject to a validation iaw FMA LUF PRO 361. | EMAD R |
| The certification basis shall be the original certification from the primary certifying authority. | | | RML |

| | | | |
|---|---|---|---|
| A Tailored Airworthiness Certification Criteria compliance document (TACC or equivalent) shall have been developed before any equipment is delivered. | TACC or equivalent (USN ECP or EDRAP) | USN ECP/EDRAP is regarded equivalent, provided it contains all Mil Handbook 516 airworthiness certification criteria. Any civilian certification basis or related data sheet is not required to reassess. | RML |
| Requirements not covered by the original Military Type Certificate (MTC) or Type Certificate (TC) shall be airworthiness certified as a Supplemental Military Type Certificate (SMTC) or equivalent. | SMTC or equivalent MACC or equivalent (USN ECP or EDRAP) | | AFI 62-601 and/or EMAR 21, or as deemed equivalent by the NMAA. |
| The Design Organization of the aircraft Type shall be the MTC Holder with responsibility for continuing airworthiness as required in EMAR21. | Design Organization Exposition (DOE) or equivalent document, from the Design Organization, Original Equipment Manufacturer or Program Office clearly stating how and by whom the responsibilities for continuing airworthiness will be managed. | The Design Organization (DO) shall be identified towards the NMAA and may be an organization with EMAR/EASA/FAR 21 Design Organization Approval (DOA), or the Original Equipment Manufacturer (OEM), or the Prime Contractor, or a government Program Office (coordinating Design Organization), or as deemed equivalent by the NMAA.<br><br>NOTE that this requirement imposes the condition that the identified organization accepts to be the MTC Holder. | RML |
| | | | |
| The system safety risk levels shall be evaluated and accepted by the NMAA | System Safety Risk Assessment (SSRA) or equivalent | | Validation procedure requirement |
| Any airworthiness criteria non-compliance or other condition which introduces additional system risk, shall be evaluated and accepted by the NMAA | system compliance document or equivalent (USN integration reports) | | Validation procedure requirement |

## APPENDIX 4, TAILORED SIMPLIFIED SAFETY APPROVAL PROCESS FOR UNMANNED TARGET DRONES

The tailored simplified safety approval process may be issued for category RO 2 and RO 3 target drones when all of the following conditions are satisfied:

1. The type was originally acquired prior to 1 Jan 2017.
2. The type only operates within segregated airspace
3. The type is equipped with a system for controlled abort of flight or destruction in the event of loss of control.

4. The type has not been subject to a complete airworthiness certification iaw 14CFR Part 23 or CS23 or equivalent (STANAG 4671, EMACC).
5. There is documented risk assessment or empirical data clearly showing that loss of control causing an airspace violation occurs less than once per 10000 flight hours, or less than once per two years at the planned usage spectrum.

In this case, the NMAA can issue a MSA based on the above evidence.

Note that for RO2 and RO3 target drones where type aquisition is initiated after 1 jan 2017, the type shall be airworthiness certified, primarily using STANAG 4671 criteria or equivalent (14CFR23, CS23) prior to release to service/MSA.

## APPENDIX 5, ABBREVIATIONS

| Abbreviation | Explanation |
|---|---|
| ASD | Air Systems Division |
| BML | Bestemmelser for Militær Luftfart (Provision for Military Aviation) |
| CAME | Continued Airworthiness Management Exposition |
| DA | Design Authority |
| DOA | Design Organisation Approval |
| EMACC | European Military Airworthiness Certification Criteria |
| EMAR | European Military Airworthiness Requirements |
| ERP | Enterprise Resource Planning |
| FFP | Fitness For Purpose |
| GBAD | Ground Based Air Defense |
| GSE | Ground Support Equipment |
| MACC | Modification Airworthiness Certification Criteria |
| MCA | Military Certificate of Airworthiness |
| MOE | Maintenance Organisation Exposition |
| MPF | Military Permit to Fly |
| MTC | Military Type Certificate |
| NDAR | Norwegian Defense Aircraft Register |
| NDMA | Norwegian Defense Materiel Agency |
| NDS | Norwegian Defense Sector |
| NMA | Norwegian Military Aircraft |
| NMAA | Norwegian Military Airworthiness Authority |
| OEM | Original Equipment Manufacturer |
| OSS&E | Operational Safety Suitability and Effectiveness |
| RMS | Retningslinjer for materiellsikkerhet/Materiel Safety Policy |
| SMTC | Supplemental Military Type Certificate |
| TACC | Tailored Airworthiness Certification Criteria |