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MAA-NOR clarification of basic training- Modules 50 - 55 (Revised)

EMAR 66 defines the requirements for technical personnel working on aircraft in the Norwegian military aircraft registry. MAA-NOR have received several questions regarding interpretations of EMAR 66 and would like to provide some guidance to the requirements as defined in EMAR 66.

The guidance will only provide an overview, and not an in-depth analysis of all possibilities. However, to enable all benefits of EMAR it is important that a bigger picture than the individual maintenance organisation is considered. EMAR 66 could provide significant benefits if implemented wisely, for instance regarding:

1. Pooling of aircraft parts
2. Flexibility of changing the scope of the maintenance organisation (for instance adding a new aircraft type)
3. Flexibility of moving or sharing maintenance personnel between maintenance organisations and between nations.
4. Skills development

It is also important to understand that the principles in EMAR might be slightly different than the previous maintainer categories used, especially in military organisations. There are opportunities using EMAR to provide more flexibility, both in and between organisations, when/if the education is planned with a strategic view. The organisations will gain a significant benefit if planning for change of scope, new or additional aircraft types, exchange of technical personnel between organisations/nations from the beginning.

For additional details, please refer to EMAR 66.

Basic knowledge

EMAR 66.A.25 (a) Basic knowledge requirements "An applicant for a MAML, the extension to a MAML or the addition of a category or subcategory to such a MAML, shall demonstrate by examination a level of knowledge in the appropriate subject modules in accordance with **Appendix I.**" Appendix I – Basic Knowledge Requirements, basic subjects for each MAML category are shown in the table below.

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Subject module	A or B1 aeroplane with:		A or B1 helicopter with:		B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics
1 Mathematics	X	X	X	X	X
2 Physics	X	X	X	X	X
3 Electrical Fundamentals	X	X	X	X	X
4 Electronic Fundamentals	X	X	X	X	X
5 Digital Techniques/Electronic Instrument Systems	X	X	X	X	X
6 Materials and Hardware	X	X	X	X	X
7 Maintenance Practices	X	X	X	X	X
8 Basic Aerodynamics	X	X	X	X	X
9 Human Factors	X	X	X	X	X
10 Aviation Legislation	X	X	X	X	X

11a Turbine Aeroplane Aerodynamics, Structures and Systems	X				
11b Piston Aeroplane Aerodynamics, Structures and Systems		X			
12 Helicopter Aerodynamics, Structures and Systems			X	X	
13 Aircraft Aerodynamics, Structures and Systems					X
14 Propulsion					X
15 Gas Turbine Engine	X		X		
16 Piston Engine		X		X	
17 Propeller	X	X			
50 Essential Principles of Armament	*	*	*	*	*
51 Weapon Stores System	*	*	*	*	*
52 Operational Attack Systems	*	*	*	*	*
53 Surveillance and Electronic Warfare	*	*	*	*	*
54 Crew Safety	*	*	*	*	*
55 Military Communication Systems					*

It is important to recognise that Module 50-55 is defined within EMAR 66.A.25.(a) and (e) is as such a part of the basic training/knowledge requirement. If a person does not have all 50-55 modules from basic training, relevant 50-

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55 modules training/exams shall in general be performed prior to aircraft type training course. A failure to have the appropriate Module 50-55 basic training will limit the possibility of personnel being eligible for type training.

A MAML holder can obtain the necessary training at any EMAR 147 approved training organisations, from a nation where MAA-NOR has [recognized the NMAA](#). The applicable recognition shall have EMAR 147 and EMAR 66 as part of the scope. The 147-organisations training must also comply with the minimum knowledge level requirements defined in EMAR 66 appendix I and examination standard defined in EMAR 66 appendix II.

Training courses/ exams for module 50-55 can be provided separately or in any combination, by an approved EMAR 147 organisation.

The 145 organisations should include in their authorisation both which MAML sub-category and extension (M50-55) the MAML holder is authorised as CRS personnel for. MAA-NOR interpretation of the intention in EMAR 145.A.35, is that the 145 organisation, prior to authorisation, should make sure that the MAML holder obtains/ has the necessary relevant experience to what he/ she is to be authorised for.

Type training

EMAR 66 Appendix III bullet 1. General states:

*Military Aircraft Type Training shall consist of theoretical training and examination, and, except for the Category C ratings, practical training and assessment. **Where Military Aircraft Type Training includes military-specific systems, the pre-requisite is that the student shall have gained the relevant 50-series modules (or sub-modules) of EMAR 66 Appendix I.***

The requirement in EMAR 66 appendix III states that there is a prerequisite to have “relevant 50-series modules”. Based on table 1, there is a requirement for basic training in most Modules 50-55 for all aircraft categories as defined in EMAR 66.A.3.(b), except for the EMAR aircraft category “helicopters piston”. As mentioned earlier in this MAIB, there are significant flexibility for the organisations and armed forces in using a harmonised generic aircraft category to allow easy conversion between aircraft types and different or changing scope of work.

EMAR appendix III bullet 3.e) identifies the Type training as follows for the aircraft categories (as defined in EMAR 66.A.3.(b)), and states “As a minimum, the elements in the Syllabus (see table below) that are specific to the aircraft type shall be covered. Additional elements introduced due to type variations, technological changes, etc shall also be included”:

ATA Chapters	Title	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
		B1	C	B1	C	B1	C	B1	C	B2
05-84	See EMAR 66 Appendix 3									
	Military specific systems:									
92	Radar	2	1	2	1	2	1	-	-	3
93	Surveillance	2	1	2	1	2	1	-	-	3
94	Weapon system	2	1	2	1	2	1	-	-	3
95	Crew Escape and Safety (partially covered by 25 for Helicopters)	3	1	3	1	3	1	3	1	2
97	Image recording	2	1	2	1	2	1	-	-	2
99	Electronic Warfare	2	1	2	1	2	1	-	-	3

Table 1 Type training requirements for different aircraft types

How MAA-NOR implements modules 50-55

Module 50-55 are basic training modules. As the main rule, basic training shall be completed before the type training begins.

MAA-NOR has concluded that all maintenance personnel that will work “hands-on” with Norwegian military aircraft must have completed module 50, *Principles of Armament*. Module 50 shall also be completed by all applicants before MAA-NOR will issue a MAML. Module 50 must also be completed for maintenance personnel to be authorised. This is already stipulated in RFK-LUFT regulation and will be further clarified in the next revision (see also NOTE below).

As a minimum, MAA-NOR accepts that a MAML only need to contain extension for modules 51-55 that are necessary for the applicable/planned type training. For example, if an aircraft type training course only has module 53 as a prerequisite, the MAML holder only need module 50 and 53 as extensions in the MAML. This will, however, require additional modules 51-55 training before beginning another type training course, and before a new type rating can be added to the MAML.

NOTE

Module 50-54 is applicable for both B1 and B2. Module 55 is applicable to B2 technicians.

MAA-NOR expects the applicable EMAR or EASA Part 147-organisation to assess which 51-55 modules are necessary before starting each individual type training course.

For technicians applying for or holding a Saab Safari type rating, modules 50-55 are not required. If any equipment that falls under the modules 50-55 categories is installed in a Saab Safari, the necessary modules must be completed.

Exemptions

Exemptions shall always be based upon an individual application.

Regarding module 50, the MAA-NOR will only grant exemptions to applicants that can show to the MAA-NOR that they have applied for a course and are on a waiting list. The maximum exemption time is one year.

MAA-NOR will issue a separate MAIB regarding time limited transitional arrangement.

Conversion

For conversion of modules 50-55 from legacy training and experience, separate requirements apply. The MAA-NOR has identified a list of legacy training courses that, combined with practical experience, is a sufficient basis for conversion.

The list is not exhaustive, and more possible courses or combinations may apply. As an example, foreign training courses are not listed, but applicants with foreign training and/or experience may still be eligible for conversion. This will be assessed by the MAA-NOR upon receiving the application.

NOTE also that the required knowledge level for module 50 is knowledge level 1. MAA-NOR will accept training with training on this level.

NOTE in the next revision of RFK-LUFT, the requirement for M50 before **authorization** will be amended to apply before the MAA-NOR issues **MAML**. Maintenance organisations can authorize personnel with MAML issued by the MAA-NOR, observing the applicable limitations and extensions, and recent experience and need for fresh-up.