



“Quantifying EMAR Implementation”

Military Airworthiness Conference
(MAC) 2017

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QUANTIFYING EMAR IMPLEMENTATION



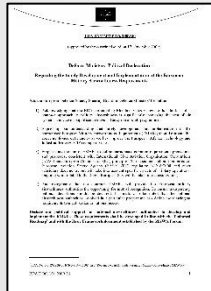
- Military AW Status in EU
- AW Status in NATO
- Available tools
- Proposed Metric and Calculation method
- Conclusions - Remarks



MILITARY AW STATUS IN EU



EDA SB Decision
MAWA Roadmap



MoD's Political
Declaration

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



MILITARY AW STATUS IN EU



EDA SB Decision
MAWA Roadmap



MoD's Political
Declaration

1. Common regulatory framework;
2. Common certification processes;
3. Common approach to organisational approvals;
4. Common certification/design codes;
5. Common approach to preservation of airworthiness;
6. Arrangements for mutual recognition;
7. Formation of a European Military Joint Airworthiness Authority (tbc).

No specific timeframe

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



MILITARY AW STATUS IN EU



Initial Airworthiness

EMAR-21

EMACC HDBK



Continuing Airworthiness

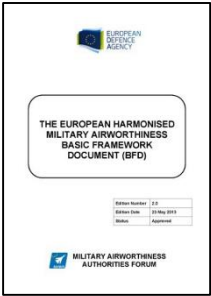
EMAR-M
EMAR-145
EMAR-66
EMAR-147



BFD 1.1



BFD 2.0



BFD 2.1





MILITARY AW STATUS IN EU



EDA SB Decision
MAWA Roadmap



1. *Common regulatory framework;*
2. *Common certification processes;*
3. *Common approach to organisational approvals;*
4. *Common certification/design codes;*
5. *Common approach to preservation of airworthiness;*
6. *Arrangements for mutual recognition;*
7. Formation of a European Military Joint Airworthiness Authority (tbc).

A “new” formation is under discussion

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



MILITARY AW STATUS IN EU



EDA SB Decision
MAWA Roadmap

Questions:

1. How much have we moved forward?
2. Can we measure our progress?

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



MILITARY AW STATUS IN EU



23 pMS have approved BFD
(any version)



9 pMS (DE, EL, ES, FI, FR, IT, NL, SE, UK)
Have performed recognitions



1. EMAR Adoption
2. Full EMAR Compliance
3. Partial EMAR Adoption
4. Partial EMAR Compliance

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



MILITARY AW STATUS IN EU



EMAR	Adopt	Full Compliance	Partial Adoption	Partial Compliance
21	11%	26%	0%	11%
M	4%	4%	0%	11%
145	19%	41%	0%	4%
147	15%	26%	0%	11%
66	7%	15%	0%	4%



1. EMAR Adoption
2. Full EMAR Compliance
3. Partial EMAR Adoption
4. Partial EMAR Compliance

Different approach
from each pMS

Sovereignty

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



MILITARY AW STATUS IN EU

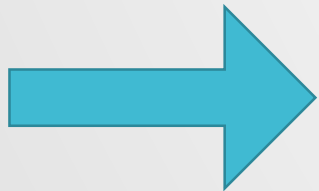


85 %



41 %

An ICAO report indicates that the average worldwide level of implementation of international safety standards in **civil aviation** in 2016 is estimated at only 63 %



Can we quantify what is the equivalent military status?

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



MILITARY AW STATUS IN EU



EDA SB Decision
MAWA Roadmap



- 1. Common regulatory framework;**
- 2. Common certification processes;**
- 3. Common approach to organisational approvals;**
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- 5. Common approach to preservation of airworthiness;**
6. Arrangements for mutual recognition;
7. Formation of a European Military Joint Airworthiness Authority (tbc).

How “common” is
implemented today?

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



AW STATUS IN NATO

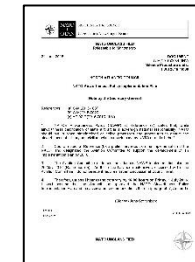


Evaluating only MAA's oversight competency

The same questions arises among NATO members



NATO AW Policy



NAWP Implementation Plan



NAWP Action Plan

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017



AVAILABLE TOOLS



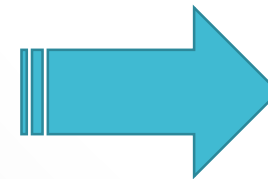
EDA has produced
EMAR question-sets (draft status)



Already developed
Consists of 800 questions



Under development by DPAG
Consists of 1000 questions



Suitable to perform
gap analysis



AVAILABLE TOOLS



EMAR M Edition 1.0 Section A Reference	Text	Question to meet the Referenced and Specified Requirement?	Has this Requirement been implemented into National Regulation? Yes/No	If Yes, then what is the applicability date for this National Regulation? dd/mm/yyyy	National Variance or addition to EMAR Requirement	EMAR Requirement Specific Questions regarding implementation
	SUBPART B - ACCOUNTABILITY					
M.A.201	Responsibilities					
M.A.201(c)	Any organisation performing maintenance shall be responsible for the tasks performed.	Is the organisation performing maintenance responsible for the tasks it performs?	<u>Yes/No</u>	<u> </u>	<u> </u>	<u> </u>



PROPOSED METRIC AND CALCULATION METHOD



EMAR 145 Edition 1.2 Section A Reference	Text	Question to meet the Referenced and Specified Requirement?	Is this Requirement incorporated into National Regulation?	Compliant to EMAR?
	TECHNICAL REQUIREMENTS			
145.A.15	Application			
145.A.15	An application for the issue or change of an approval shall be made to the National Military Airworthiness Authority (NMAA) in a form and manner established by such authority.	Is there a requirement for a Maintenance Organisation to make an application to the NMAA in an agreed form and manner for the issue or change of an approval?	<u>YES</u>	<u>++</u>
145.A.20	Terms of approval			
145.A.20	The organisation shall specify the scope of work deemed to constitute approval in its exposition. (Appendix II to this EMAR contains a table of all classes and ratings)	Is the Maintenance Organisation required to specify within an exposition the scope of work of its approval?	<u>YES</u>	<u>±</u>
145.A.30	Personnel requirements			
145.A.30 (b)4.	Procedures shall make clear who deputises for any particular person in the case of lengthy absence of the said person.	Are procedures required to make it clear who deputises for any particular person in the case of their lengthy absence?	<u>NO</u>	



PROPOSED METRIC AND CALCULATION METHOD



Gap analysis

- **1st step**, possible answers “**YES**” or “**NO**”
 - If there are national regulations/procedures dealing with the same issue as the EMAR question.
- **2nd step**, if “**YES**”, 3 possible answers (without any text):
 - “++”, if national regulations/procedures **meet fully** the scope and intention of the EMAR question.
 - “+”, if national regulations/procedures **do not meet fully** the scope and intention of the EMAR question.
 - “-“, if national regulations/procedures deal the issue in the **opposite way**, than EMAR intention.



PROPOSED METRIC AND CALCULATION METHOD



Gap analysis

The answers “**YES** , - ” are the most cumbersome to deal with, because people are accustomed to work this way and changing it would need more effort.

EMAR M **does not** allow a CAMO to issue Permit to Fly (PtF)

A nation might **allow** a CAMO to issue PtF



PROPOSED METRIC AND CALCULATION METHOD



Gap analysis



Calculate Indexes



$I_{21,EL}$



$I_{M,EL}$



$I_{145,EL}$



$I_{147,EL}$



$I_{66,EL}$

$$I_{\#,EL} = \frac{\text{Number of YES("++", "+")} }{\text{Total EMAR \# questions}}$$



PROPOSED METRIC AND CALCULATION METHOD



Gap analysis



Calculate Indexes



Calculate Total Index



I_{EMAR,pMS_1}



I_{EMAR,pMS_27}





PROPOSED METRIC AND CALCULATION METHOD



Gap analysis



Calculate Indexes



Calculate Total Index



$I_{21,EDA}$



$I_{M,EDA}$



$I_{145,EDA}$



$I_{147,EDA}$



$I_{66,EDA}$



PROPOSED METRIC AND CALCULATION METHOD



Gap analysis



Calculate Indexes



Calculate Total Index



$I_{21,EDA}$

$I_{M,EDA}$

$I_{145,EDA}$

$I_{147,EDA}$

$I_{66,EDA}$

$$I_{21,EDA} = a_{21,pMS_1} * I_{21,pMS_1} + \dots + a_{21,pMS_{27}} * I_{21,pMS_{27}}$$

$$\sum a_{21,pMS_{\#}} = 1$$



PROPOSED METRIC AND CALCULATION METHOD



Gap analysis



Calculate Indexes



Calculate Total Index



$I_{21,EDA}$



$I_{M,EDA}$



$I_{145,EDA}$



$I_{147,EDA}$



$I_{66,EDA}$



$I_{EMAR,EDA}$



PROPOSED METRIC AND CALCULATION METHOD



Gap analysis



Calculate Indexes



Calculate Total Index

Setting weight factors

- Number of companies involved in military aviation (per country)
- Annual turnover of companies involved in military aviation (per country)
- Number of people working in military aviation (per country)
- Annual military expenditure (per country)
- Number of flying assets (per country)

Amount for procuring new assets
Amount for sustaining old assets

Small assets (Fighters, Trainers, Helicopters)
Large assets (Transport, Flying tanker)

Production & Design Organizations
Maintenance Organizations
Training Organizations





PROPOSED METRIC AND CALCULATION METHOD



Gap analysis



Calculate Indexes



Calculate Total Index

Assumptions

- All questions have the same value (per EMAR)
- Not all pMS have an established MAA, however they apply the intention of EMAR.
- A company is considered as 100% compliant, if it has 1 approval.
- Procurements in defence and security domain are published (Directive 81/2009/EC)



PROPOSED METRIC AND CALCULATION METHOD



7.300 Flying assets



$$I_{M,EDA} = 44,8\%$$

	pMS _{_1}	pMS _{_2}	pMS _{_3}	.....	pMS _{_25}	pMS _{_26}	pMS _{_27}
$I_{M,\#}$	17%	71%	20%	.....	82%	58%	58%
Number of Flying assets	1305	856	822	.....	10	6	4
a_M	0,1775	0,1164	0,1118	.....	0,00136	0,00082	0,00054



CONCLUSIONS - REMARKS

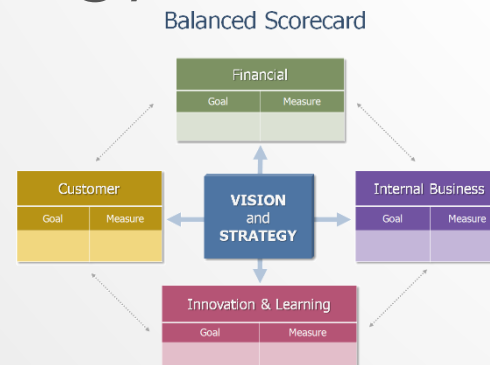


- Proposed metric can be considered as a KPI



Linking Strategy with
Decision Making

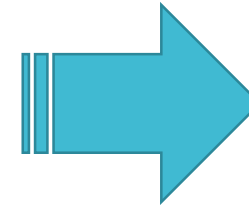
- Utilizing BSC methodology





CONCLUSIONS - REMARKS

- Since strategic approach is set in the mid-long term
- Quality principles application
- Evaluate AW policy plans and performed actions



Enhance
resources
exploitation

Reduce
implementation
plan timeframe



CONCLUSIONS - REMARKS



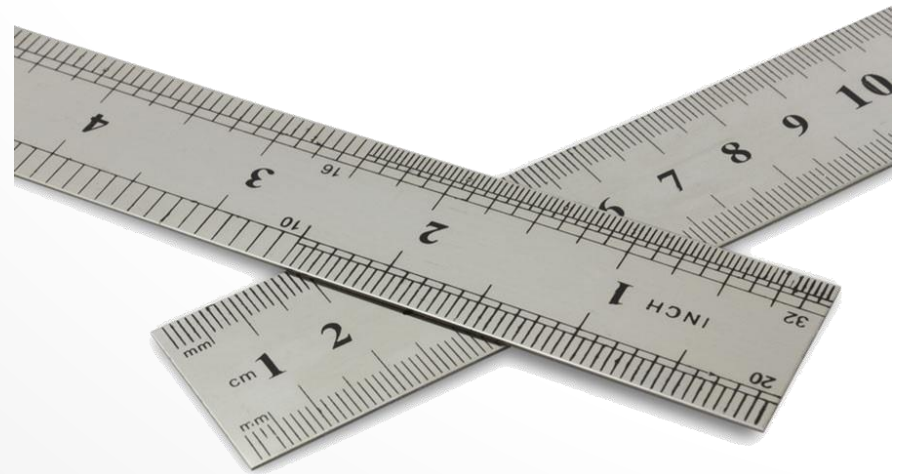
pMS gain

EDA gain

- Allows measurable progress
- Correlation between actions taken and benefit (cost, time)
- Increased transparency in decision making
- Enhances ownership – accountability
- Support recognition process



CONCLUSIONS - REMARKS





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