

EASA eRules

Easy Access Rules in machine-readable format (XML)

Your safety is our mission.

An Agency of the European Union

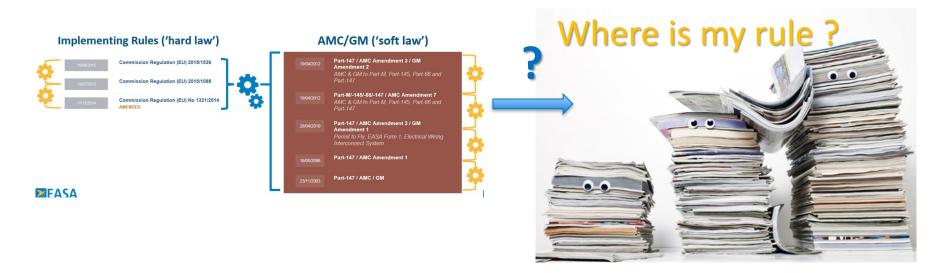
Agenda

TIME	SUBJECT	SPEAKER
10:00 – 10:05	Welcome and presentation of the presenters	Anna Ngu
10:05 – 10:10	Overview of the eRules project	Anna Ngu
10:10 – 10:20	Data structure in eRules	Anna Ngu/ Steffen Frederiksen
10:20 – 10:50	The choice of the XML format & how it can be used	Steffen Frederiksen
10:50 – 11.20	Answering questions received prior to the event	Steffen Frederiksen
11:20 – 12:00	Answering ad-hoc questions about the XML format	Steffen Frederiksen



Trigger for eRules

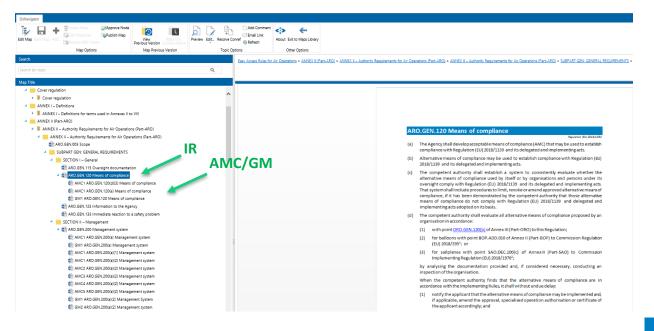
- Lack of single source of rules
- Complexity of European aviation regulatory system
- Inefficiency in internal and external processes



What is eRules?

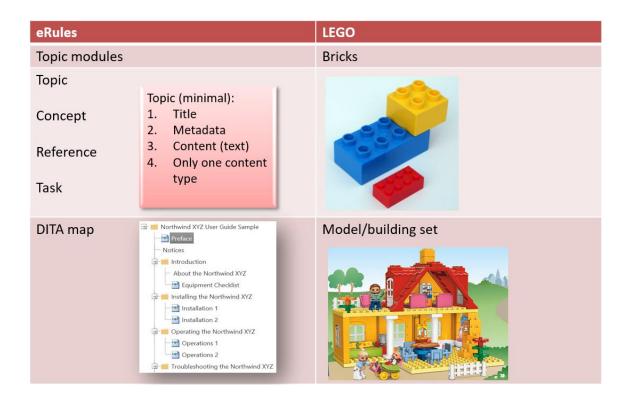
- Platform for managing aviation rules based on a Component Content Management System (CCMS)
- Easy Access Rules are published from eRules

eRules = structured data





Units of information – Lego analogy



Content is divided into topics

Topics are assembled into maps



Division of the content into 'topics'

> A "TOPIC" is the smallest unit of information that makes sense to the reader, in standalone mode.

26.105 Emergency exit access

Regulation (EU) 2015/640

Operators of large aeroplanes used in commercial air transport shall provide means to facilitate the rapid and easy movement of each passenger from their seat to any of the emergency exits in case of an emergency evacuation.

CS 26.105 Emergency exit access

ED Decision 2020/023/R (applicable from 26.2.2021)

Compliance with point 26.105 of Part-26 is demonstrated by complying with CS 25.813(d) to (f) or equivalent, or with the following:

- (a) Reserved.
- (b) If it is necessary to pass through a passageway between passenger compartments to reach any required emergency exit from any seat in the passenger cabin, the passageway is unobstructed. However, curtains may be used if they allow free entry through the passageway.
- (c) No door is installed in any partition between passenger compartments.



Set of metadata attached to every topic

Map Options		
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arch for topic Q		G Cut X
lap Title	Save Cancel Paste	Delete Item
20. 10 Competent autnonity	Commit Clipboa	rd Actions
26.20 Temporary inoperative equipment	Secondary applicability da	te
26.30 Demonstration of compliance	Secondary appreading ad	In cases where content is applicable on two dates, enter the second date
26.30(a) Demonstration of compliance		here.
26.30(b)(c) Demonstration of compliance	DxKeywords	
SUBPART B — LARGE AEROPLANES	e Antoj Monae	
26.50 Seats, berths, safety belts, and harnesses	Amended by	6
CS 26.50 Seats, berths, safety belts, and harness	EASACategory	6
GM1 26.50(c) Cabin crew seat location with i		
26.60 Emergency landing – dynamic conditions	Aircraft category	Large aeroplanes;
CS 26.60 Emergency landing – dynamic conditio	Aircraft use	Commercial air transport (CAT);
GM1 26.60 Emergency landing – dynamic cc		
26.100 Location of emergency exits	Aircraft registry	EU-registered;
CS 26.100 Location of emergency exits	Technical subject matter	ATA 25;
26.105 Emergency exit access		
CS 26.105 Emergency exit access	General Aviation	6
26.110 Emergency exit markings	Deleted	
CS 26.110 Emergency exit markings		Used to indicate that a topic is no longer applicable.
GM1 26.110(d) Universal symbolic exit signs	Regulated entity	Aircraft operator;
GM1 26.110(e)(4) Emergency Exit Markings		
26.120 Interior emergency lighting and emergency l	Regulatory source	Regulation (EU) 2015/640
CS 26.120 Interior emergency lighting and emer	Type of content	IR (Implementing rule)
 26.150 Compartment interiors 		
CS 26.150 Compartment interiors	ICAOreference	Annex 6;
GM1 26.150(a) Compartment interiors	Activity type	Aircraft operations;
GM1 26.150(c) Compartment interiors	Demois	
GM1 26.150(d) Compartment interiors	Domain	Additional airworthiness specifications; Air operations;
26.155 Flammability of cargo compartment liners	Version: 1.1	Save Can
•	Created at 7/28/2017 17:48 b	by DxAppModel on behalf of ditaremote remote



EASA

Topic in XML

🖉 AutoSave 💽 Off) 🔚 Part-26 in XML.xml + Saved ~ 🖉 Ste	ffen Frederiksen 🕼 🌽 – 🗆 🗙
File Home Insert Draw Design Layout References Mailings Review View	Developer Help DitaExchange 🖓 🖆
C IVIII Add-Ins ♥ ♥	
CS 26.100 Location of emergency exits	s Annex I (Part-26) SUBRART B — LARGE AEROPLANES Decision 2020(22)// (applicable from 26.2.021)
If one or more emergency exits are deactivated, the distance(s) betw	
no more than 18.3 m (60 feet) from any adjacent passenger emerge same deck of the fuselage, as measured parallel to the aeroplane': nearest exit edges. [Issue: 26/3] 26.105 Emergency exit access	<pre><w:sdt></w:sdt></pre>
Operators of large aeroplanes used in commercial air transport shall rapid and easy movement of each passenger from their seat to any c an emergency evacuation.	<pre> </pre>
Page 28 of 97 27423 words English (United States) 🐻 (D, Focus	<pre><pre><pre></pre>(w:p wirsidR="00CE76DD" wirsidR=="00E76DD" wirsidP="00BD410A" </pre>(w:p wirsidR="00BE755A" wirsidR="00BD410A" wl4:textId="150581AE"></pre>
	longitudinal axis between the nearest exit edges.



Map in XML

Word/PDF TOC

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	SUBPART B — LARGE AEROPLANES
	26.50 Seats, berths, safety belts, and harnesses
	CS 26.50 Seats, berths, safety belts, and harnesses
	26.60 Emergency landing – dynamic conditions
	GM1 26.60 Emergency landing – dynamic conditions
	26.100 Location of emergency exits
	CS 26.100 Location of emergency exits
	26.105 Emergency exit access
	CS 26.105 Emergency exit access
	26.110 Emergency exit markings
	CS 26.110 Emergency exit markings
	GM1 26.110(d) Universal symbolic exit signs
	GM1 26.110(e)(4) Emergency Exit Markings
	26.120 Interior emergency lighting and emergency light operation
	26.150 Compartment interiors
	CS 26.150 Compartment interiors
	GM1 26.150(a) Compartment interiors
	GM1 26.150(d) Compartment interiors
	26.155 Flammability of cargo compartment liners
	CS 26.155 Flammability of cargo compartment liners
	26.156 Thermal or acoustic insulation materials
	CS 26.156 Thermal/acoustic insulation materials40
	GM1 26.156(a) Insulation materials installed as replacement
	26.157 Conversion of Class D compartments
	26.160 Lavatory fire protection
	26.170 Fire extinguishers
	Powered by EASA eRules Page 10 of 100 Jan 2023
Page 10 of 100	26730 words (D, Focus 🗐 🗐 🌀 – — 🛶 + 80

Export XML (and map) structure

<pre><er:toc> <er:topic -1748360523"="" -736622335"="" 1186377145"="" 879449670"="" <="" ll86377145"="" pre="" sdt-id="593794994" source-title="CS 26.60 Emergency landing - dyna"></er:topic></er:toc></pre>
<pre><er:topic)<="" pre="" sdt-id="-1748360523" source-title="CS 26.60 Emergency landing - dynamics"></er:topic></pre>
<er:toc></er:toc>
<pre><er:topic -1966231053"="" <="" pre="" sdt-id="95076102" source-title="26.100 Location of emergency exits"></er:topic></pre>
<er:toc></er:toc>
<pre><er:topic -455773973"="" <="" pre="" sdt-id="1689902351" source-title="26.105 Emergency exit access"></er:topic></pre>
<er:toc></er:toc>
<pre><er:topic <="" pre="" sdt-id="949973199" source-title="CS 26.105 Emergency exit access"></er:topic></pre>
<pr:topic <="" pre="" sdt-id="-486372749" source-title="26.110 Emergency exit markings"></pr:topic>
<er:toc></er:toc>
<pre></pre>

Metadata in XML

<er:topic< th=""><th><pre><w:sdt> </w:sdt></pre> <pre><w:sdtpr> <w:sdtpr> <w:alias w:val="topic"></w:alias> <w:tag w:val="topic"></w:tag></w:sdtpr></w:sdtpr></pre></th></er:topic<>	<pre><w:sdt> </w:sdt></pre> <pre><w:sdtpr> <w:sdtpr> <w:alias w:val="topic"></w:alias> <w:tag w:val="topic"></w:tag></w:sdtpr></w:sdtpr></pre>
<pre>sdt-id="1689902351" source-title="CS 26.100 Location of emergency exits" ERulesId="ERULES-1963177438-2927" Domain="Additional airworthiness specifications;Air operations;" ActivityType="Aircraft operations;" AircraftUse="Commercial air transport (CAT);" AircraftCategory="Large aeroplanes;" AmendedBy="CS Issue 3;" ApplicabilityDate="26 February, 2021" EntryIntoForceDate="18 December, 2020"</pre>	<pre></pre>
EquivalentForeignRegulation="FAA Part-121;" ICAOReference="" Keywords="MEL" RegistryState="EU-registered;" RegulatedEntity="Aircraft operator;" RegulatorySource="ED Decision 2020/023/R" RegulatorySubject="Part-26;CS-26;"	<pre><w:r w:rsidrpr="00CE76DD"></w:r></pre>
TechnicalSubject= Part-26;CS-26; TypeOfContent="CS (Certification specification);" ParentIR="26.100 Location of emergency exits" EASACategory=""/>	<w:p <="" w="" w:rsidr="000279B1" w:rsidrpr="00CE76DD" w:sdtcontent=""> </w:p>



Easy Access Rules – available in 3 formats







PDF format – from 2017

- Consolidated, structured content
- Ca. 140 consolidated books published on the website

Online publication – from 2020

- Adjustment to mobile views (tablets, phones)
- Online filters to provide a view tailored to users' needs

XML format

 Machine-readable format – for integration with stakeholders' applications



Easy Access Rules – available in 3 formats

Regulations

Navigate through the regulation structure by area of implementation. Access detailed information for each individual regulation group by clicking on the title in the first column of the overview below.



Basic Regulation

Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency

Easy Access Rules: Basic Regulation (Regulation (EU) 2018/1139)

Initial Airworthiness

Commission Regulation (EU) No 748/2012 of 3 August 2012 - Airworthiness and Environmental Certification

Easy Access Rules: Airworthiness and Environmental Certification (Regulation (EU) No 748/2012)

Publications

- Easy Access Rules for Airworthiness and Environmental Certification (Regulation (EU) No 748/2012) (Online format)
- Easy Access Rules for Airworthiness and Environmental Certification (Regulation (EU) No 748/2012) (PDF)
- Easy Access Rules for Airworthiness and Environmental Certification (Regulation (EU) No 748/2012) (XML) View technical XML documentation





The choice of the XML format and how it can be used

in the XML annotation> ement> plexType name equence> :element name xs:annotation <xs:document file.</xs: /vs:annotatio



Why XML or why not ...?





Why XML and Why Office Open XML (ECMA-376, ISO/IEC 29500)?

- \rightarrow Requirements for the EASA eRules export format:
 - → Support as many different stakeholder use cases as possible, from the simplest to the most complex
 - → High fidelity no loss of information no loss of the modular structure
 - \rightarrow Support for content validation
 - → Self-contained, one file encapsulating graphics objects, formulas, even 3rd party formats (e.g. Math, Chemical)
 - → Editable, human-readable and machine-readable
 - \rightarrow International standard
 - \rightarrow Fully documented
 - → Rich set of editors, tools, and interfaces (APIs) must be available



eRules XSLT transformation example

\rightarrow XML to JSON example:

```
<ison>
{"topic" :{
        "metadata" :{
               "source-title" :{"val" : "CS 26.100 Location of emergency exits", },
               "ERulesId" :{"val" : "ERULES-1963177438-2927", },
               "Domain" :{"val" : "Additional airworthiness specifications; Air operations;", },
               "ActivityType" :{"val" : "Aircraft operations:", },
               "AircraftUse" :{"val" : "Commercial air transport (CAT);", },
               "alias" :{"val" : "topic", },
                     :{"val" : "1689902351", }
                "id"
                1.
       "content" :{
               "t" :" If one or more emergency exits are deactivated, the distance(s) between the
                        remaining exits is (are) no more than 18.3 m (60 feet) from any adjacent passenger emergency exit
                       on the same side of the same deck of the fuselage, as measured parallel to the aeroplane's
                       longitudinal axis between the nearest exit edges." }
</ison>
```



Editors and other tools

 \rightarrow Editors

- → Any XML or text editor/coding tool that can handle large files (1-10MB)
- → Microsoft Word (as a viewer and quick validator of the format)
- \rightarrow Other tools and standards:
 - → XML DOM, XSLT, XSD Schema, and XPath
 - \rightarrow Open XML SDK



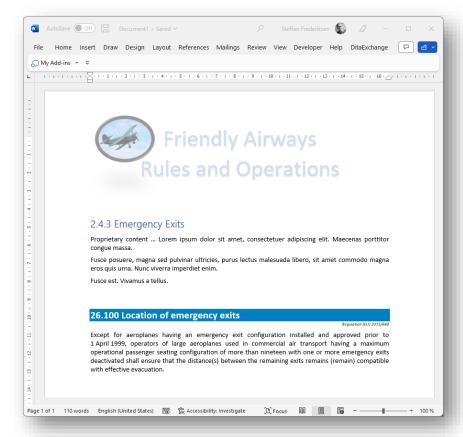
How it can be used?



- \rightarrow From simple to complex use cases
 - → Simply add your proprietary content and formatting, and print
 - \rightarrow Transform as needed and import into existing applications
 - \rightarrow Import into existing regulatory application
 - → Import into knowledge portals
 - → Import into existing CCMS
 - \rightarrow Import into existing database
 - → Automated impact analysis on rule changes (by linking and using ERulesId)



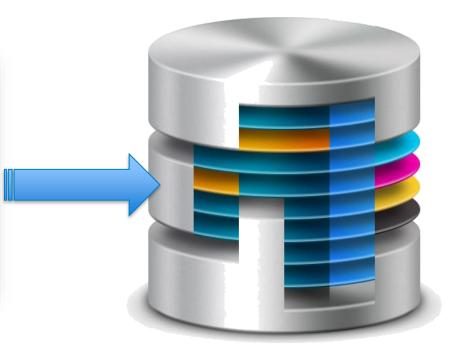
Authoring Proprietary Standard Operating Procedures (SOPs)





Import to a database application

SQL-RECORD [Guid ("2E2B9C47-B7E2-4D37-97C9-998E3489F8C6")] source-title="CS 26.100 Location of emergency exits" ERulesId="ERULES-1963177438-2927" Domain="Additional airworthiness specifications; Air operations;" ActivityType="Aircraft operations;" AircraftUse="Commercial air transport (CAT);" AircraftCategory="Large aeroplanes;" AmendedBy="CS Issue 3;" ApplicabilityDate="26 February, 2021" EntryIntoForceDate="18 December, 2020" EquivalentForeignRegulation="FAA Part-121;" ICAOReference="" Keywords="MEL" RegistryState="EU-registered;" RegulatedEntity="Aircraft operator;" RegulatorySource="ED Decision 2020/023/R" RegulatorySubject="Part-26;CS-26;" TechnicalSubjectMatter="ATA 25;ATA 26;" TypeOfContent="CS (Certification specification);" ParentIR="26.100 Location of emergency exits" EASACategory="" ContentBLOB="1689902351"





Integrate into existing CCMS application







Previous questions and answers

in the XML da annotation> ement> plexType name equence> :element name xs:annotation <xs:document file.</xs: /vs:annotatio



Frequently Asked Questions –

https://www.easa.europa.eu/en/the-agency/faqs/easy-access-rules-xml

	Sta	y informed on COVID-19 updates from EA	SA Read more > Subscribe >		
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The Agency	Home / The Agency / Frequently Asked Questions	/ Using the FAQ / Easy Access Rules XML			
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 Restrictive measures – Russia 				SEARCH RESET	
 Agency Organisation Structure 				SEARCH RESET	
EASA Member states	✓ EXPAND ALL QUESTIONS				
 Management Board 					
Other EASA Boards & Bodies	How to find and extract the images er	mbedded in the OOXML flat file?		~	
✓ Careers 𝔗 Was this helpful? YES (2) № (0)					
✓ Brexit					
✓ Procurement					
 Frequently Asked Questions 	Since the format of the formulas insid	e OOXML is OMML, can you reco	ommend a way to transform	those to MathML (which is the 🗸 🗸	
Using the FAQ	standard for HTML)?				
The Agency	\mathscr{O} Was this helpful? YES (1) NO (0)				
EU restrictive measures against Russia Brexit					
 Regulations 					
Ainworthiness Directives (ADs)	How can we import the XML into an S	QL database?		~	
 Acceptable Means of Compliance (AMC) and Alternative Means of Compliance (AltMoC) 	Ø Was this helpful? YES (0) № (0)				
Alternative Method of Compliance (AMOC) to an Airworthiness Directive (AD)					



How to identify changes?

When an amended version of a rule is published in the XML format, is there a way to determine what are the changes compared

to a previous version?

There are several ways to make a comparison. One is to simply - programmatically - compare the two XML files and extract the changes. In addition to that or as an alternative to this method, you can use the attribute topic-metadata/@RegulatorySource. When a topic which appears in one version of a publication is modified in a subsequent version, the value of its attribute topic-metadata/@RegulatorySource changes.

For example: The topic with the identifier ERulesId="ERULES-1963177438-2548" was present in one version of a rule with the value of the attribute topic-metadata/@RegulatorySource ="ED Decision 2014/012/R" If the topic's content is modified in the next version of the rule, then the attribute topic-metadata/@RegulatorySource will receive a new value corresponding to the decision that approved the change, for example topic-metadata/@RegulatorySource ="ED Decision 2018/009/R"





How to identify changes?

When an amended version of a rule is published in the XML format, is there a way to determine what are the changes compared

	<er.copic< th=""></er.copic<>
There are several ways to	sdt-id:
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changes. In addition to t	ERules
When a topic which appe	Domain:
metadata/@RegulatoryS	Activi
metadata enceatatorys	7.4

to a previous version?

For example: The topic w
value of the attribute to
version of the rule, then
that approved the chang

🔗 Was this helpful?

sdt-id="1689902351"	d extract the
source-title="CS 26.100 Location of emergency exits"	id exclude the
ERulesId="ERULES-1963177438-2927"	atorySource.
Domain="Additional airworthiness specifications; Air operations;"	ribute topic-
ActivityType="Aircraft operations;"	-
AircraftUse="Commercial air transport (CAT);"	
<pre>AircraftCategory="Large aeroplanes;" AmendedBy="CS Issue 3;"</pre>	
ApplicabilityDate="26 February, 2021"	le with the
EntryIntoForceDate="18 December, 2020"	fied in the next
EquivalentForeignRegulation="FAA Part-121;" ICAOReference=""	
Keywords="MEL"	o the decision
RegistryState="EU-registered;"	
RegulatedEntity="Aircraft operator;"	
RegulatorySource="ED Decision 2020/023/R"	
RegulatorySubject="Part-26;CS-26;"	
TechnicalSubjectMatter="ATA 25;ATA 26;"	
TypeOfContent="CS (Certification specification);"	
ParentIR="26.100 Location of emergency exits"	
FASACategory-""/>	

AMC/GM related to IR – how do I identify the relationship in the XML file?

 Annex III — Part-ADR.OR SUBPART A — GENERAL REQUIREMENTS (ADR.OR.A) SUBPART B — CERTIFICATION — AERODROMES AND AERODROME OPERATORS (ADR.OR.B) ADR.OR.B.005 Certification obligations of aerodromes and aerodrome operators ADR.OR.B.015 Application for a certificate GM1 ADR.OR.B.015 Application for a certificate AMC1 ADR.OR.B.015(a) Application for a certificate AMC1 ADR.OR.B.015(b)(1);(2);(3);(4) Application for a 		NERAL REQUIREMENTS (ADR.OR.A) CITIFICATION — AERODROMES AND ERATORS (ADR.OR.B) Certification obligations of aerodromes and rators Application for a certificate AB.015 Application for a certificate DR.B.015(a) Application for a certificate	<pre><er:topic "="" activitytype="Certification;" aircraftcategory="" aircraftuse="" amendedby="" applicabilitydate="6 March, 2014 [point ADR.OR.B.015(b)(2)(ii) until 26 January 2022]" domain="Aerodromes;" easacategory="" entryintoforcedate="6 March, 2014" equivalentforeignregulation="" erules1d="ERULEs-1963177438-2088" icaoreference="Annex 14;" keywords="Initial certification; application form; CB proposal; ELOS proposal; certification certification request; aerodrome design; proposed design; proposed facilities; certification RegistryState=" parentir="" regulatedentity="Aerodrome operator;" regulatorysubject="Part-ADR.OR;" sdt-id="-17327623" source-title="ADR.OR.B.015 Application for a certificate" technicalsubjectmatter="" typeofcontent="IR (Implementing rule);"></er:topic> </pre>	
l	GM1 ADR.OF	R.B.015(b)(2) Application for a certificate R.B.015(b)(2)(3)(4) Application for a certificate	<pre><er:topic <="" activitytype="Certification;" adt-id="1407406001" aircraftcategory="" aircraftuse="" amendedby="" applicabilitydate="6 March, 2014" domain="Aerodromes:" entryintoforcedate="6 March, 2014" equivalentforeignregulation="" erulesid="ERULES-196317438-2633" icaoreference="Annex 14;" keywords="Expression of interest; preliminary meeting; pre-application" pre="" registrystate="" regulatedintity="Aerodrome operator;" regulatorysource="ED Decision 2014/012/R" source-title="GM1 ADR.OR.B.015 Application for a certificate"></er:topic></pre>	
5.2	2.19 Attribut	e topic-metadata / @ParentIR Identification of the 'parent-child'	RegulatorySubject="Part-ADR.OR;" TechnicalSubjectMatter="" TypeOfContent="GM to IR (Guidance material to implementing rule);" ParentIR="ADR.OR.B.015 Application for a certificate" EASACategory=""/> <ertopic <br="" sdt-id="142678844">source-title="AMC1 ADR.OR.B.015(a) Application for a certificate"</ertopic>	
		in a nested structure. Typically, the 'child' topics. That relationship, how This attribute holds the title of the example, for each AMC/GM in a following condition is met:	ERulesid="ERULES-1963177438-2624" Domain="Aerodromes;" ActivityTyge="Certification;" AircraftUse="" AircraftCategory="" AmendedBy="" ApplicabilityDate="6 March, 2014" EntryIntoForceDate="6 March, 2014" EquivalentForeignRegulation="" ICAOReference="Annex 14;" Keywords="Application form" RegulatorySource="ED Decision 2014/012/R" RegulatorySubject="Part-ADR.0R;" TechnicalSubjectMatter="" TypeOfContent="AMC to IR (Acceptable means of compliance to implementing rule);" ParentR="ADR.0R.B.015 Application for a certificate" EASACategory=""/> Certopic adt.id="182123260"	
SA		 the topic has a direct topic the table of contents (ToC) 	source-title="AMC1 ADR.OR.B.015(b)(1);(2);(3);(4) Application for a certificate"	

Questions?





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- 1. Create an account on the EASA website
- 2. Go to the **Event** page of your interest
 - & Go to Get notified section, click Follow this item
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 - \rightarrow Your stream on the EASA Homepage
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 - Push notification

Go to the event https://www.easa.europa.eu/en/newsroom-andevents/events/easy-access-rules-machine-readable-format-xmlhow-use-it

