




AeroSpace and Defence
Industries Association of Europe



S4000P

**International specification for
developing and continuously
improving preventive
maintenance**

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FILTON / UK
16th of October 2014



Welcome and introduction

Speaker Stefan Schiele

1982 to 1994:

German Air Force, incl. studies at the Military University in Munich (Engineer Aerospace Technologies)

1995:

Nomination as expert under the oath of German courts for civil aircraft damages and maintenance

1995 to 1999:

Head of maintenance for the German high speed magnetic test train "Transrapid"

1999 until today:

EADS AIRBUS Defence & Space (and the previous company names):

- MSG-3 analyst for EUROCOPTER (today AIRBUS Helicopters)
- ILS management for several AIRBUS military UAV projects incl. flight tests in Spain + Canada
- ISMO development and application of several ISMO projects for military aircraft in Germany (Tornado, P-3C Orion CUP, Eurofighter)
- Member in ASD S4000M and ASD S4000P working groups since 2005 and European chairman of the Steering Committee ASD S4000M / ASD S4000P since 2013
- A400M German operator maintenance plan (OMP) development, update and optimization,
- ...

Since 1995 and in parallel to my above mentioned employee activities:

- Delivery of expert statements to courts and to private companies/persons
- Maintenance related seminars and consulting for projects



CONTENT OF THIS PRESENTATION

1. S4000P History
2. S4000P Content
3. S4000P Benefits
4. S4000P Applications
5. Discussion / Questions...





1. S4000P HISTORY (1/4)



Title of ASD S4000M Issue1.0 (not officially published):

International specification for developing scheduled maintenance programs



Publication of ASD S4000P Issue1.0 on the 24th of May 2014 with a new title:

International specification for developing and continuously improving preventive maintenance



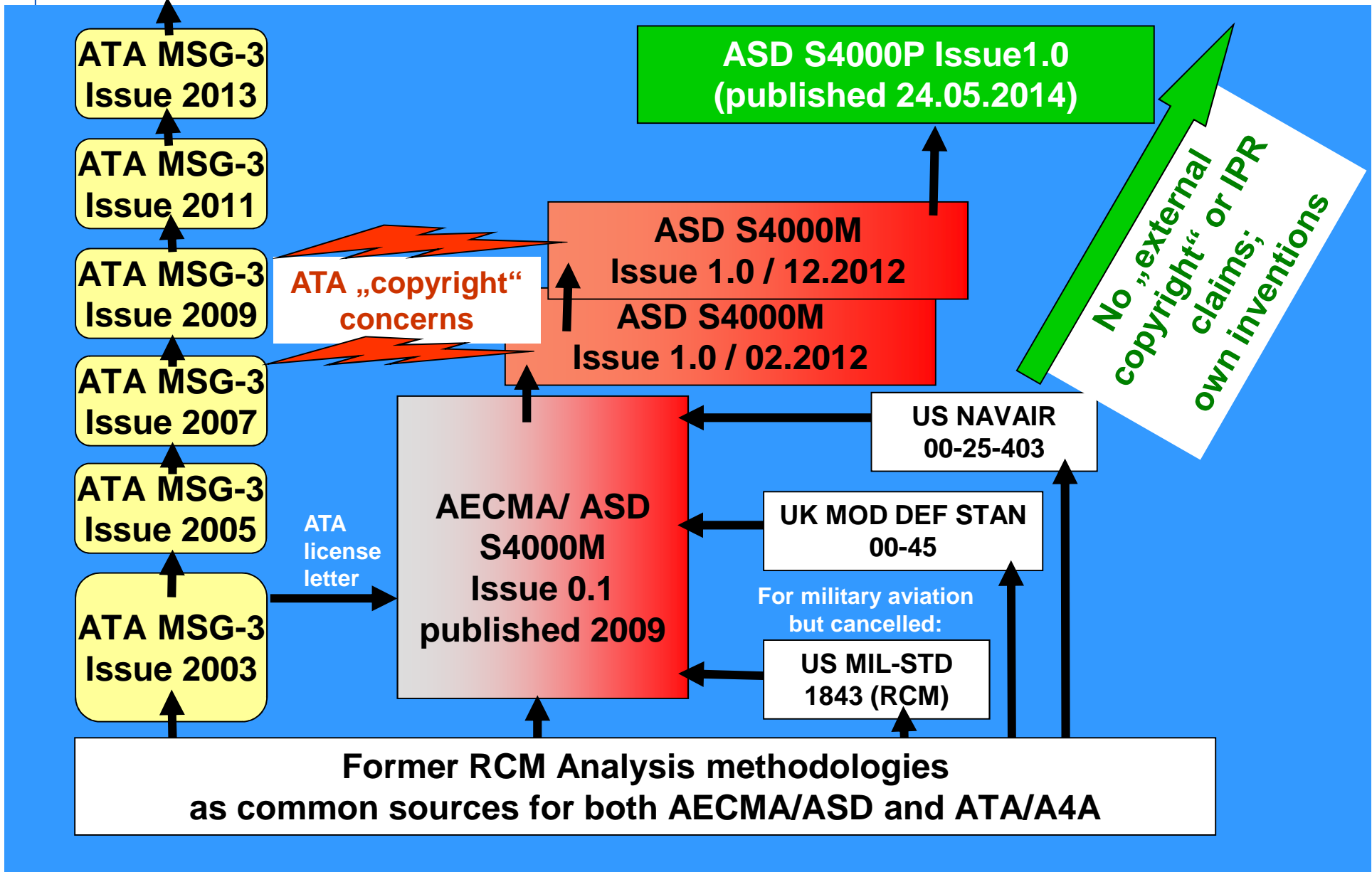
1. S4000P HISTORY (2/4)



- ❑ In 2004 the Product Support Group (PSG) of AECMA (later named ASD) conducted a feasibility study for a specification for scheduled maintenance program development initially needed for military aircraft
- ❑ Development of ASD S4000M (M selected for military) was launched at European industry with delays due to missing experts
- ❑ ASD S4000M Issue 1.0 was finalized by European industry already in 2012
- ❑ IPR / copyright concerns raised by ATA/A4A (US); resulting license letter discussions could not be brought to an end
- ❑ ASD responsables decided to develop an “independent” specification in 2013 !
- ❑ The new specification with own IPR was named ASD S4000P Issue 1.0



1. S4000P HISTORY (3/4)





1. S4000P HISTORY (4/4)



ASD S4000P Issue 1.0

- ❑ A new and extended ASD scope led to the new specification
- ❑ “Updates+extensions+improvements/innovations” in Product system-analysis, structure-analysis and zonal-analysis
- ❑ Introduction of the In-Service Maintenance Optimization (ISMO) process
- ❑ 4 invention messages initiated by Airbus Defence & Space with a formal registration of the innovation messages mid of May 2014
- ❑ Finalization of the editorial work on all S4000P chapters mid of May 2014
- ❑ Official publication by ASD on the **24th of May 2014...**

...with free access to ASD S4000P Issue 1.0 for information, downloading and commenting on the web-page www.s4000p.org

ASD 2. S4000P CONTENT

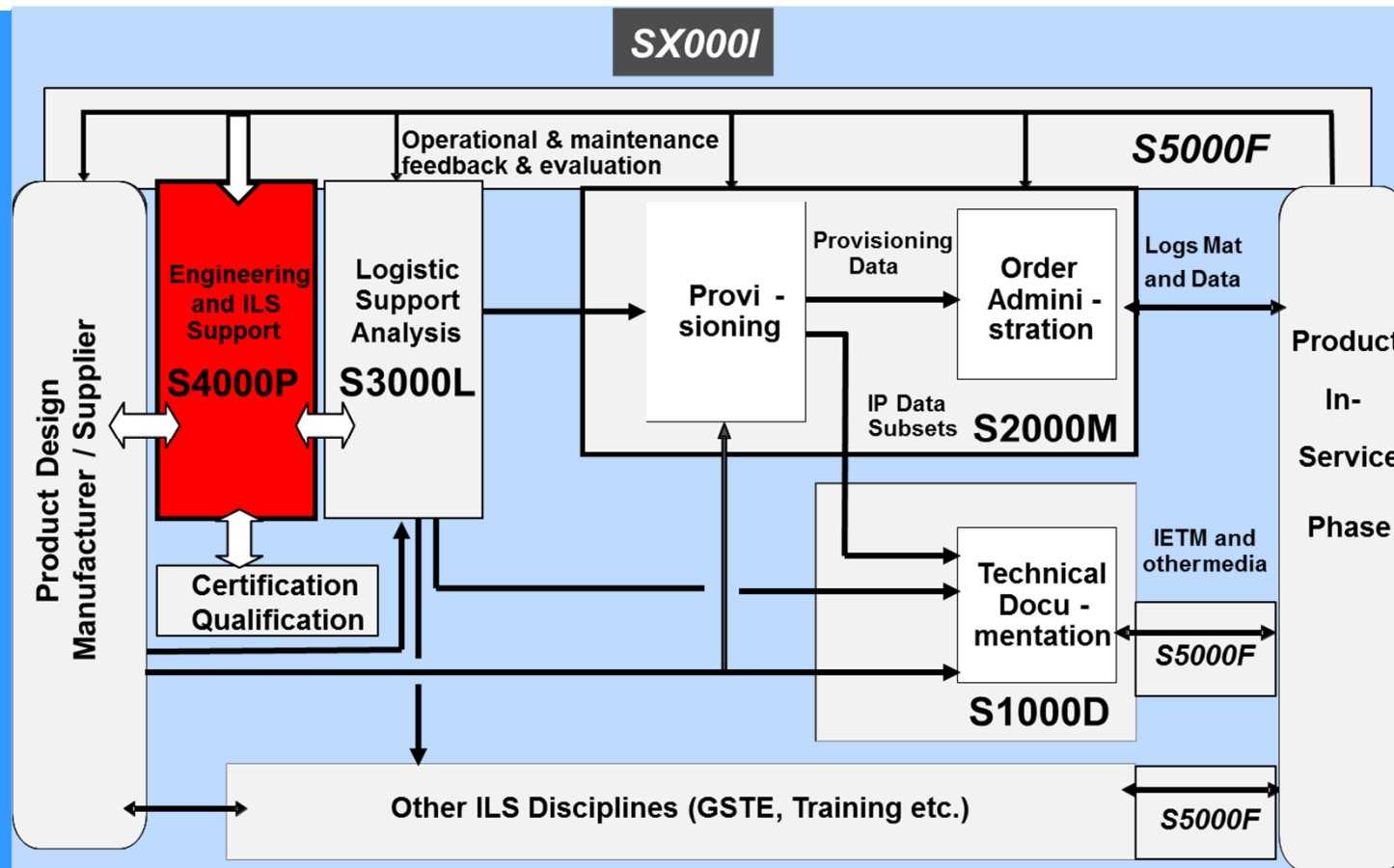


	Introduction to the specification	Chap 1	
Basic D&D analysis	Development of preventive task requirements with intervals	Chap 2	...also subject to ATA/A4A MSG-3
	General	Chap 2.1	
	System analysis	Chap 2.2	
	Structure analysis	Chap 2.3	
	Zonal analysis	Chap 2.4	
	Consolidation of analysis results, harmonization with other preventive maintenance task requirement sources, traceability	Chap 2.5	
ISMO	In-service maintenance optimization (ISMO)	Chap 3	only ASD S4000P
	General	Chap 3.1	
	ISMO preparation phase	Chap 3.2	
	ISMO analysis phase	Chap 3.3	
	ISMO follow-up phase	Chap 3.4	
S4000P interfaces	Interfaces of S4000P	Chap 4	
	General	Chap 4.1	
	S4000P interfaces outside the S-Series of ASD specifications	Chap 4.2	
	Interface S4000P – S1000D	Chap 4.3	
	Interface S4000P - S3000L	Chap 4.4	
	Interface S4000P - S5000F	Chap 4.5	
	Interface S4000P - SX000I	Chap 4.6	
	Terms, abbreviations and acronyms	Chap 5	...also subject to ATA/A4A MSG-3
	Terms, abbreviations and acronyms - Glossary of terms	Chap 5.1.	
	Terms, abbreviations and acronyms - Abbreviations and acronyms	Chap. 5.2	
	Examples	Chap 6	only ASD S4000P

ASD 3. S4000P BENEFITS (1/5)



3.1. S4000P is an integrated part of the ASD/AIA S-Series of Specifications + no „island solution“ with missing/unclear interfaces



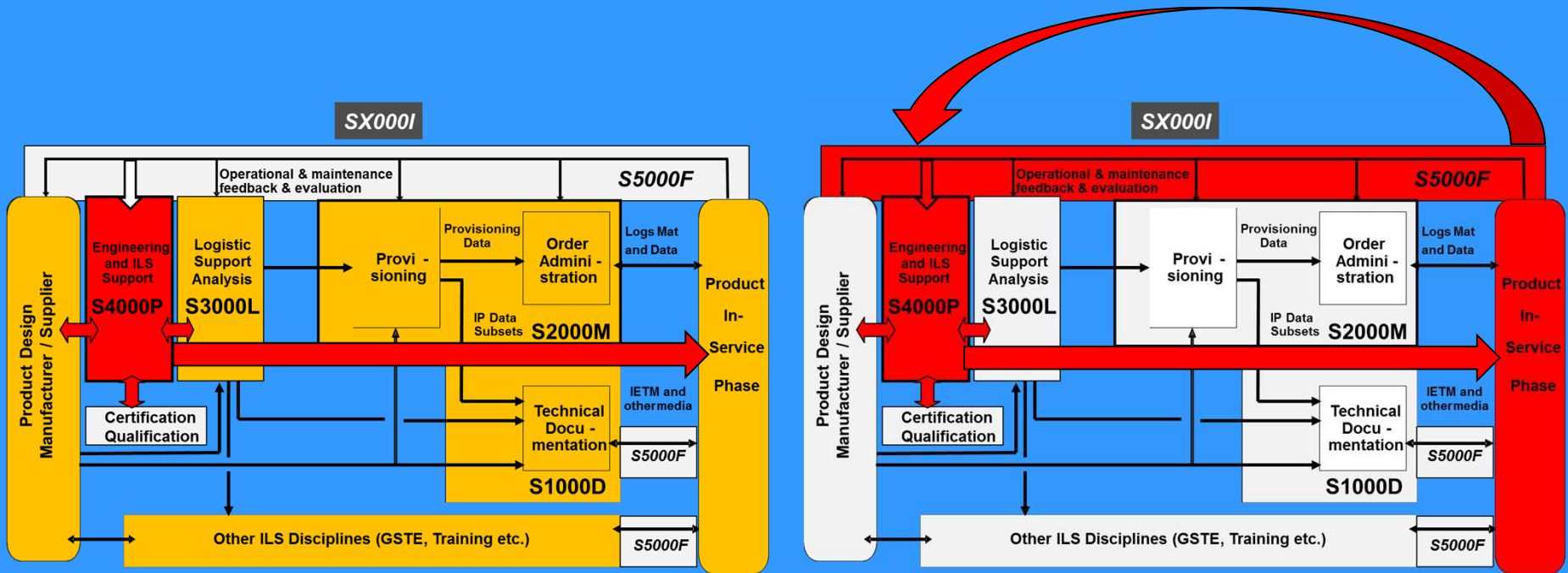
Notes: >S6000T (Training) was already initiated but not yet implemented in the Fig. above
>additional specifications are planned



3. S4000P BENEFITS (2/5)



3.2. S4000P processes and analysis methodologies cover the whole product life cycle (incl. in-service phase)



S4000P Chapter 2:
Engineering support
and interface between Design and ILS
during Product development prior
entry into service (EIS)

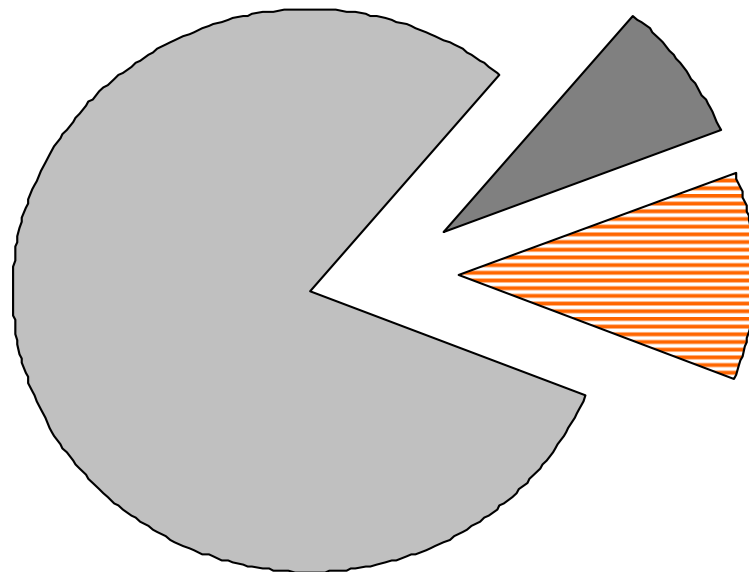
S4000P Chapter 3:
Maintenance optimization
impacting ILS resources during
the Product in-service phase



3. S4000P BENEFITS (3/5)



3.3. S4000P application on all complex technical products (not limited e.g. on civil aircraft only)



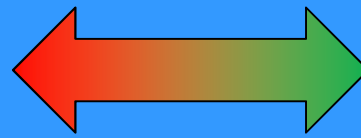
- **Non-aeronautic technical products**
- **Military aircraft**
(UK MOD Def Stan 00-45)
- **Civil aircraft**
(ATA/A4A MSG-3 for large civ. aircraft)



3. S4000P BENEFITS (4/5)



3.4. S4000P process supports the traceable development of a Product maintenance programme in combination with chapter 10 of the specification ASD/AIA S3000L Issue 1.1



Chapters 2+3:
 Developing and continuously improving
**PREVENTIVE MAINTENANCE
 TASK REQUIREMENTS
 (PMTR)**
 with original interval types
 and numerical interval values

Chapter 10:
 Process and rules
 for defining appropriate
 interval clusters;
 selecting PMTR as
 packaging candidates;
 packaging of PMTR into
 interval clusters;
 rules for interval adjustments;
 etc.

Remark:

Chapter 10 of ASD/AIA S3000L Issue 1.1 is applicable to develop a Product maintenance programme even if a Logistic Support Analysis (LSA) according to S3000L is not decided for a Product/project.



3. S4000P BENEFITS (5/5)

3.5. S4000P is based on an „improvement requirement list“ written prior to the development start in 2004 and is additionally based on 4 invention messages in 2014

Improvement requirement lists from Industry for

- System analysis
- Structure analysis
- Zonal analysis
- General topics

mainly based on analysis experiences with ATA MSG-3 and Mil-Std 1843 (RCM)



AIRBUS D&S invention messages for

- System analysis
- Structure analysis
- Zonal analysis
- ISMO



4. S4000P APPLICATIONS (1/3)



S4000P basic D&D analysis

- ❑ Mil-Std-1843 (RCM) was cancelled and doesn't support military aircraft development / analysis
- ❑ no application of S4000P for a new Product development up to now
- ❑ a replacement of the analysis Guideline for the Eurofighter project (presently based on Mil-Std 1843 (RCM)) is under discussion
- ❑ negotiations for new projects at AIRBUS Helicopters (civil) and for future military UAV projects at AIRBUS D&S,...
- ❑ due to missing alternatives until publication of S4000P: Use of ATA/A4A MSG-3 analysis methodology for civil aircraft- and selected military aircraft analysis at EADS (e.g. for NH90, A400M)
- ❑ parts/chapters of S4000P have already been initially developed by predecessor organisations of AIRBUS D&S in the frame of NH90 MSG-3 analysis in the early 2000 or in the frame of a German "AZI" Tornado in 1990 (AZI was a comparable to ISMO process now).

The S4000P-IT-TOOL development has started in Germany



4. S4000P APPLICATIONS (2/3)



S4000P ISMO Analysis

- ❑ first generic application of ISMO aspects by MBB / Germany (later EADS) for MRCA PA200 TORNADO (the optimization program was called “AZI” in 1990) **SUCCESS (significant reduction of effort plus airworthiness gaps closed)**
- ❑ development variant and application of optimization process on magnetic high speed train TRANSRAPID TR07 at the company Thyssen-Transrapid / Germany in the time period from 1995 to 1997 **SUCCESS (incl. avoidance of the test track closure)**
- ❑ first full application of the ISMO process for EUROFIGHTER of export nation Austria (optimization program was called “OPM” around the year 2012) **SUCCESS (~30% effort reduction)**

„Simplified“ IT-TOOLS developed by and available at AIRBUS D&S



4. S4000P APPLICATIONS (3/3)



ISMO

- in parallel full application of the ISMO process for Lockheed Martin P-3C Orion Cup of the German Navy (optimization program was also called “OPM” around the year 2012)

SUCCESS (effort reduction >30%)

- for EUROFIGHTER (EF) core nations (UK, GE, IT, SP) the ISMO process is defined, accepted by nations and industry and has already started in 2014 (optimization program is called “EISMO”)

DECIDED AND PROJECT HAS STARTED

- other projects e.g for military H/C, for non-aeronautic and civil Products,...

PLANNED

„Simplified“ IT-TOOLS developed by and available at AIRBUS D&S,
„Professional“ IT-TOOL is under development for EF Core Nations



5. DISCUSSION / QUESTIONS



Thank you for your attention !