Certification Challenges and Proposals in Korea Standpoint

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Defense Acquisition Program Administration

Clean DAPA !

TRANSPARENCY INTERNATIONAL

DAPA

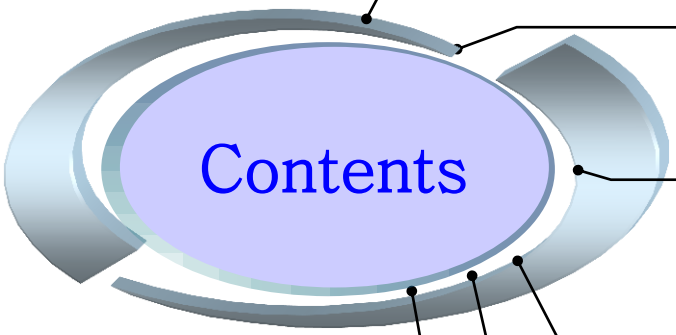
TRANSPARENCY INTERNATIONAL UK
fighting corruption worldwide

TRANSPARENCY INTERNATIONAL KOREA

Transparency is The First Value of DAPA.

We want Flight Safety Harmonization based on
Worldwide Transparency Cooperation

Scope



- Introduction
- ROK Military AC System
- ROK Military A/W Status
- ROK A/W Lesson Learn
- Proposals for International Community
- Conclusion

Introduction (1/2)

The Military Airworthiness Certification Act of August 2009 was the cornerstone of the military aviation safety in Korea.

The Act charges the Administrator of the Defense Acquisition Program Administration(DAPA) with

- Certificating Military Aircraft and Issuing COA
- Establishing safety standards

The Certification Planning Division assumes primary responsibility for airworthiness certification.

Introduction (2/2)

Republic of Korea(ROK)

The ROK faces

- Japan across the East Sea

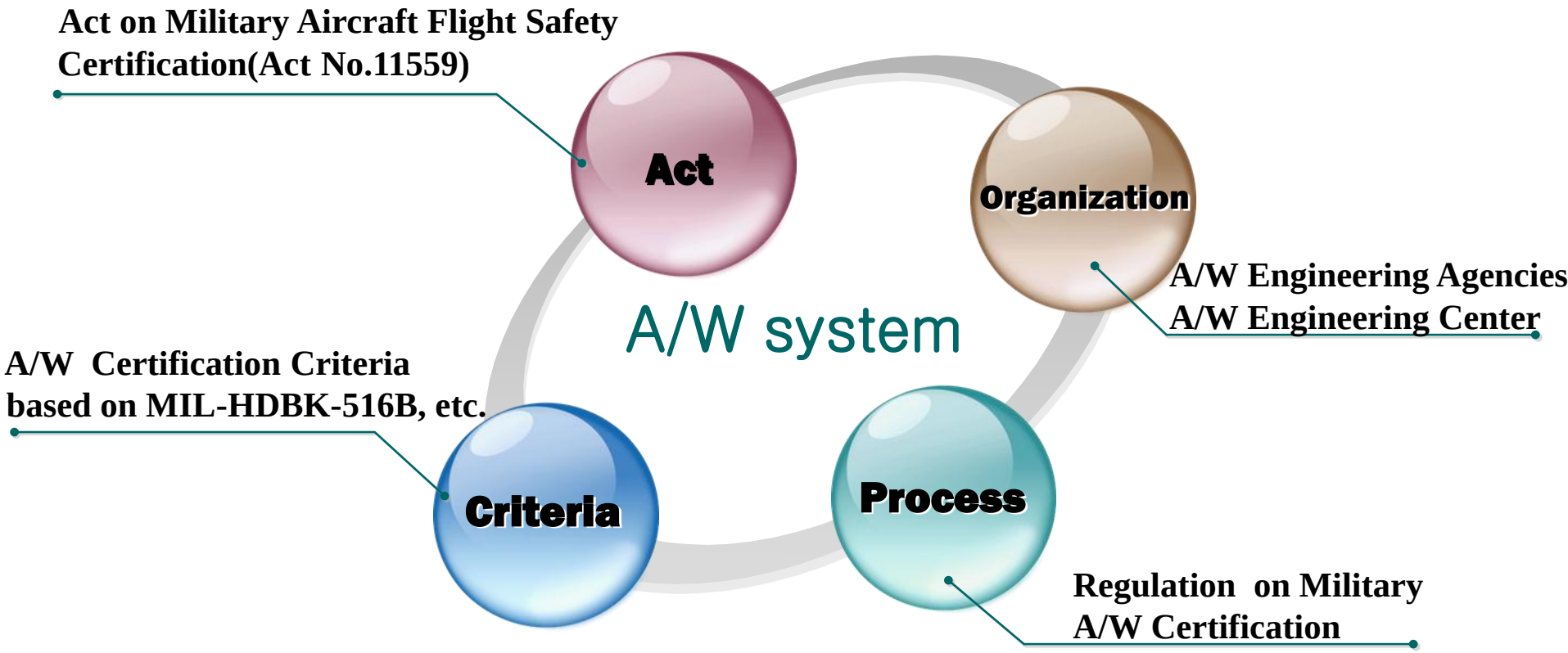
- China across the Yellow Sea

- North Korea to the north

Capital City	Seoul
Population	48.87 million
Language	Hangul

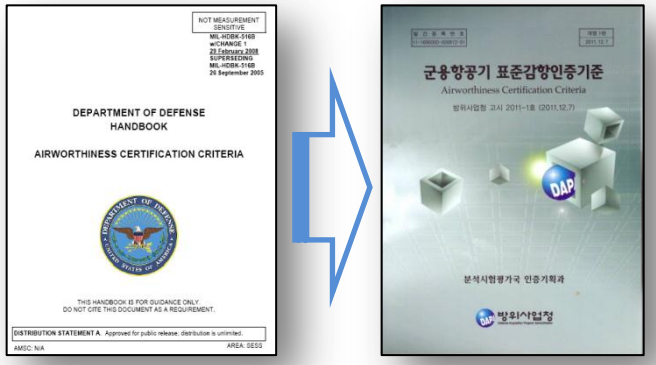
ROK Military A/W System(1/3)

ROK Military A/W Certification System



ROK Military A/W System(2/3)

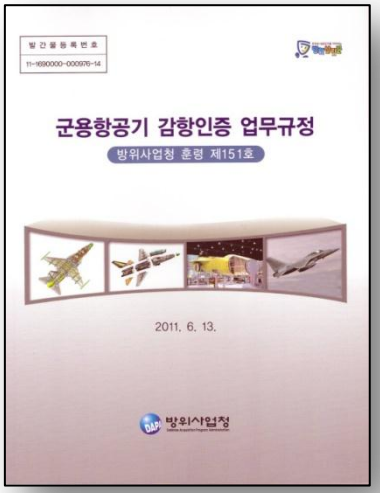
Military A/W Cert'criteria Set up



- **Standard Airworthiness Certification Criteria**
  - Based on "Mil-HDBK-516B"
- **Other A/W Cert' Criteria based on program features**
  - FAA FARs, U.S Armed Forces HDBK, EASA CS etc.

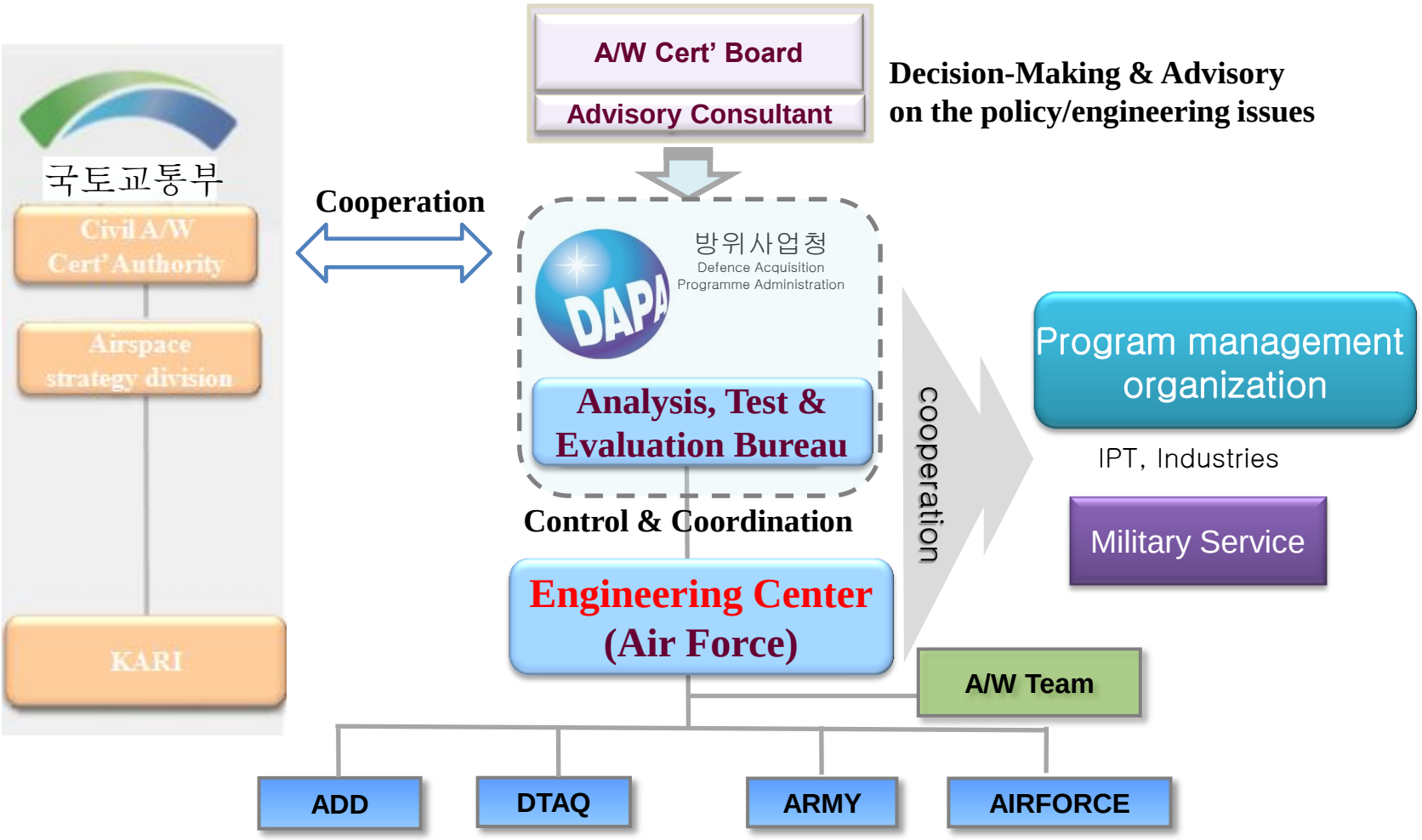
Detail A/W working process regularization

- **DAPA Regulation No. 214(3rd revision)**
  - Certification procedure per type of program
  - Personnel management, training, inauguration process
  - Technical data management, support
  - Process for issuance of certificates
- **Templates to apply A/W in working level**



ROK Military A/W System(3/3)

ROK A/W Certification Organization



ROK Miliatry A/W Status (1/9)

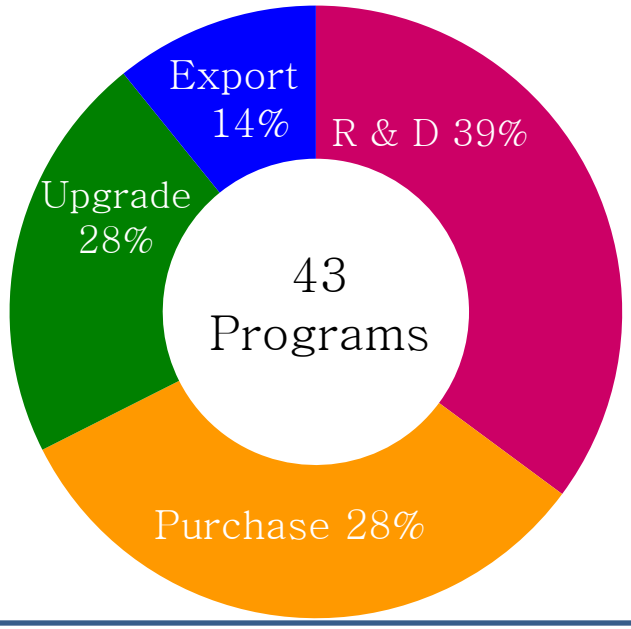
Main A/W cases

Program Type		Case
R & D	 	**KT-1, KUH, FA-50, UAV, etc**
Purchase	 	**F-X, C-130J, HAH, Maritime operation Helicopter, etc**
Upgrade	 	**KF-16, C-130H, CN-235, Maritime scouter, HH-60 upgrade, etc**
Export	 	**T-50i, KT-1T, KT-1P**

ROK Miliatry A/W Status(2/9)

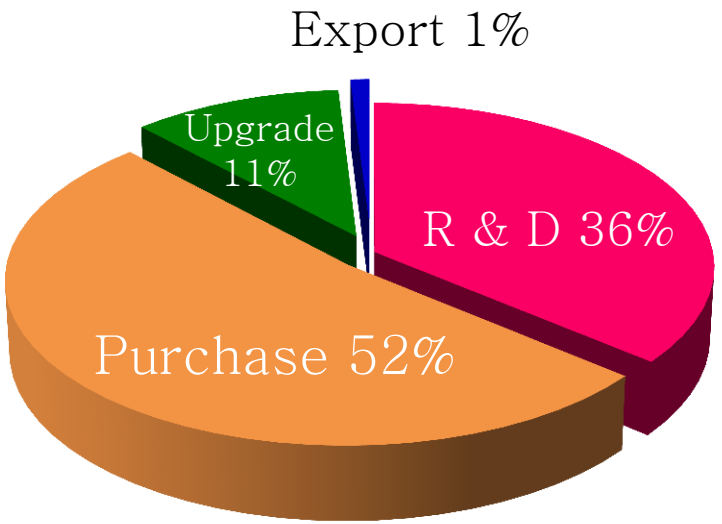
Program Type and Budget comparison

Per Type



R & D > Purchase > Upgrade > Export

Per Budget



Purchase > R & D > Upgrade > Export

ROK Miliatry A/W Status(3/9)

'09.8 ***Effective Act for Military Airworthiness Certification***

Weapon System Approval

'98.12 '03.7 '05.11 '09.12 '12.6 '12.10 '13.6 '13.11

KT-1

KA-1

T-50

✓*KT-1T*
✓*Military Trainer*
✓*TC-09-001*

✓*KUH*
✓*Utility Helicopter*
✓*TC-2012-001*

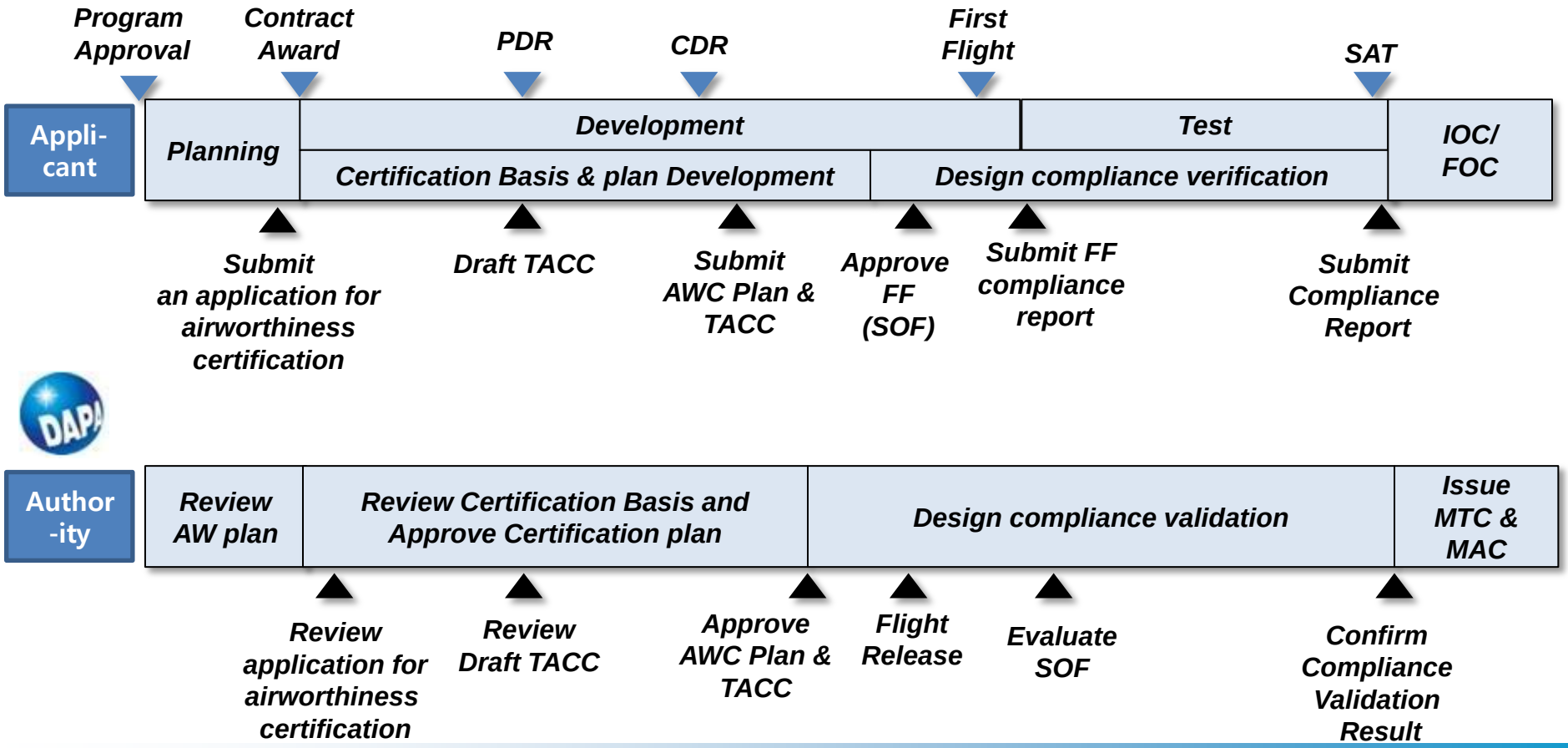
✓*FA-50*
✓*Military Light Attacker*
✓*TC-2012-002*

T-50i

KUH-1P

ROK Miliatry A/W Status (4/9)

Korea Military Airworthiness Certification Process



ROK Miliatry A/W Status(5/9)

KT-1P Airworthiness Certification Status

Subsonic Aircraft

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방위사업청
THE REPUBLIC OF KOREA
DEFENSE ACQUISITION PROGRAM ADMINISTRATION
MILITARY AIRWORTHINESS CERTIFICATION AUTHORITY

형식인증서
Military Type Certificate

(번호 No. TC-09-001)

1. 항공기 형식(Aircraft Type) KT-1T
2. 개발자(Developer) Korea Aerospace Industries Ltd.
3. 항공기 분류(Aircraft Category) Military Trainer
4. 개발자 주소(Developer Address) 802, Yachon-Ri, Sanam-Myeon, Sacheon-Si, Gyeongsangnam-Do, Korea
5. 발행기준 및 조건(Basis of Issuance and Conditions)

KT-1T 항공기의 형식설계(Type Design)가 FAR Part23 의 기준에 따라 군용항공기 비행안전성 인증에 관한 법률의 감항인증 요구조건을 만족함을 인증하며, 상세 인증정보는 감항성 형식인증목록에 명기되어 있음.
This Certificate certifies that Type Design for KT-1T Aircraft with the operating limitations and conditions thereby as specified in the Type Certificate Data Sheet meets the FAR Part 23 Airworthiness Requirements in accordance with Korean Military Aircraft Airworthiness Act.

6. 발행연월일 Date of Issuance 2009. 12. 22

방 위 사 업 청 장

Commissioner of Defense Acquisition Program Administration

대 한 민 국
방위사업청
THE REPUBLIC OF KOREA
DEFENSE ACQUISITION PROGRAM ADMINISTRATION
MILITARY AIRWORTHINESS CERTIFICATION AUTHORITY

감항인증서
Military Airworthiness Certificate

(번호 No. AC-2010-001)

1. 항공기 형식(Aircraft Type) KT-1T
2. 제작자(Manufacturer) 한국항공우주산업(주) Korea Aerospace Industries Ltd.
3. 항공기 분류(Aircraft Category) Military Trainer
4. 항공기 일련번호/등록번호 (Aircraft Serial Number(s)/Tail Number(s)) KTT-3340F-10-001 / 10-01
5. 발행기준 및 조건 Basis of Issuance and Conditions

본 감항인증서는 KT-1T (KTT-3340F-10-001) 항공기가 대한민국 군용항공기 비행안전성 인증에 관한 법률에 따라 KT-1T 항공기 형식인증(TC-09-001)에 합치하게 제작되고, 관련 기술기준을 준수하여 비행안전에 적합함을 인증합니다.
This Airworthiness Certificate is issued pursuant to the Military Airworthiness Certification Act of Republic of Korea and certifies that KT-1T (KTT-3340F-10-001) aircraft has been produced and found to conform to its type certificate (TC-09-001), therefore to be in condition for safe operation, and has been shown to meet technical standard.

6. 발행연월일 Date of Issuance 2010. 3. 29

방 위 사 업 청 장

Commissioner of Defense Acquisition Program Administration

- **Airworthiness Certification Criteria**
  - TACC based on FAR Part 23
  - 876 Articles / 8 Criteria (General, Strenth, etc)
- **Number of Compliance Date : 306 documents**
- **Type Certificate issued on December 22, 2009**
- **Certificate of Airworthiness issued for 00**

ROK Miliatry A/W Status (6/9)

T-50/FA-50 Airworthiness Certification Status

Supersonic Aircraft

THE REPUBLIC OF KOREA
DEFENSE ACQUISITION PROGRAM ADMINISTRATION
MILITARY AIRWORTHINESS CERTIFICATION AUTHORITY

Type Certificate

대한민국
THE REPUBLIC OF KOREA
방위사업청
DEFENSE ACQUISITION PROGRAM ADMINISTRATION

MILITARY AIRWORTHINESS CERTIFICATION AUTHORITY

감 항 인 증 서
Military Certificate of Airworthiness

- **Airworthiness Certification Criteria**
  - TACC based on Mil-HDBK-516B
  - 1,324 Articles / 14 Criteria (General, Structure, etc)
- **Number of Compliance Date : 1,278 documents**
- **Type Certificate issued on October 31, 2012**
- **Certificate of Airworthiness issued for 00**

ROK Miliatry A/W Status (7/9)

✓ Compliance Check List(Sample – T-50 International)

No.	Standard Airworthiness Certification Criteria	Tailored Airworthiness Certification Criteria		MOC	Verification Document	
		ACC	Detailed ACC		Document Number	Document Title
8.1	Hydraulic and pneumatic systems					
8.1.5	Verify that adequate crew station information is available to notify the flight crew of the hydraulic and pneumatic systems' operating conditions. JSSG-2009 B.3.4.2.1.3/B.4.4.2.1.3, B.3.4.2.1.4.3/B.4.4.2.1.4.3, B.3.4.2.1.4.4/B.4.4.2.1.4.4, B.3.4.2.2.3/B.4.4.2.2.3, M.3.4.13.3/M.4.4.13.3	Verify that adequate Crew Station information Is available to notify the Flight crew of the hydraulic systems' operating conditions.	8.1.5-a System fluid monitoring. A means shall be provided to monitor hydraulic system fluid quantity. A means to indicate hydraulic fluid level should be located on or near the hydraulic reservoir.	1	85H5500-101 85H5700-101	Hydraulic System Installation Drawing
				7	85AEI-29-0100	Hydraulic System Fill, Bleed, Leak Check And Operation Checkout For T-50
			8.1.5-b System Pressure Indication Pressure indicating equipment shall be provided to indicate the system pressure in hydraulic systems or subsystems.	1	1T-50A-2-29GS-00-1	Ⅳ. Hydraulic System Indicating (29-30-00)
				7	85AEI-29-0100	Hydraulic System Fill, Bleed, Leak Check And Operation Checkout For T-50
			8.1.5-c System Low-Pressure Warning Light A warning light shall be installed in the cockpit in a conspicuous location to warn the pilot of low hydraulic system pressure.	1	85DS2931-201	Schematic Diagram - Hydraulic Pressure IND/LOW Warning
				7	85AEI-29-0100	Hydraulic System Fill, Bleed, Leak Check And Operation Checkout For T-50
			8.1.5-d Instrumentation interface(s). As a minimum, the following instrumentation should be provided: a. Hydraulic power system pressure (each system) b. Low pressure indicator (each system)	1	85DS2931-201	Schematic Diagram - Hydraulic Pressure IND/LOW Warning
				7	85AEI-29-0100	Hydraulic System Fill, Bleed, Leak Check And Operation Checkout For T-50

ROK Miliatry A/W Status (8/9)

KUH-1 Airworthiness Certification Status

THE REPUBLIC OF KOREA
DEFENSE ACQUISITION PROGRAM ADMINISTRATION
MILITARY AIRWORTHINESS CERTIFICATION AUTHORITY

Type Certificate

THE REPUBLIC OF KOREA
DEFENSE ACQUISITION PROGRAM ADMINISTRATION
MILITARY AIRWORTHINESS CERTIFICATION AUTHORITY

Airworthiness Certificate

- **Airworthiness Certification Criteria**
  - TACC based on FAR Part 29
  - 773 Articles / 9 Criteria (General, Structure, etc)
- **Number of Compliance Date : 1,251 documents**
- **Type Certificate issued on June 18, 2012**
- **Certificate of Airworthiness issued for 00**

ROK Miliatry A/W Status (9/9)

ROK A/W Lesson Learn (1/3)

Lessons from an importer standpoint






- **Airworthiness compliance(technical) data-sharing required**
- **The difficulty of continued airworthiness certification in the case of a change to the form, fit, function during the service life**

⇒ Need to share the airworthiness compliance data for the independent airworthiness determination by importing country

ROK A/W Lesson Learn (2/3)

Lessons from a developer standpoint




- **Difficulty for selecting the airworthiness criteria to ensure appropriate level of safety for a brand new aircraft developed by Korea**

  ※ the Difference of A/C requirement between ROK – Allied nations, etc.

  ⇒ Combined efforts to build the more cost-effective military airworthiness system and the global harmonization of military airworthiness criteria

ROK A/W Lesson Learn (3/3)

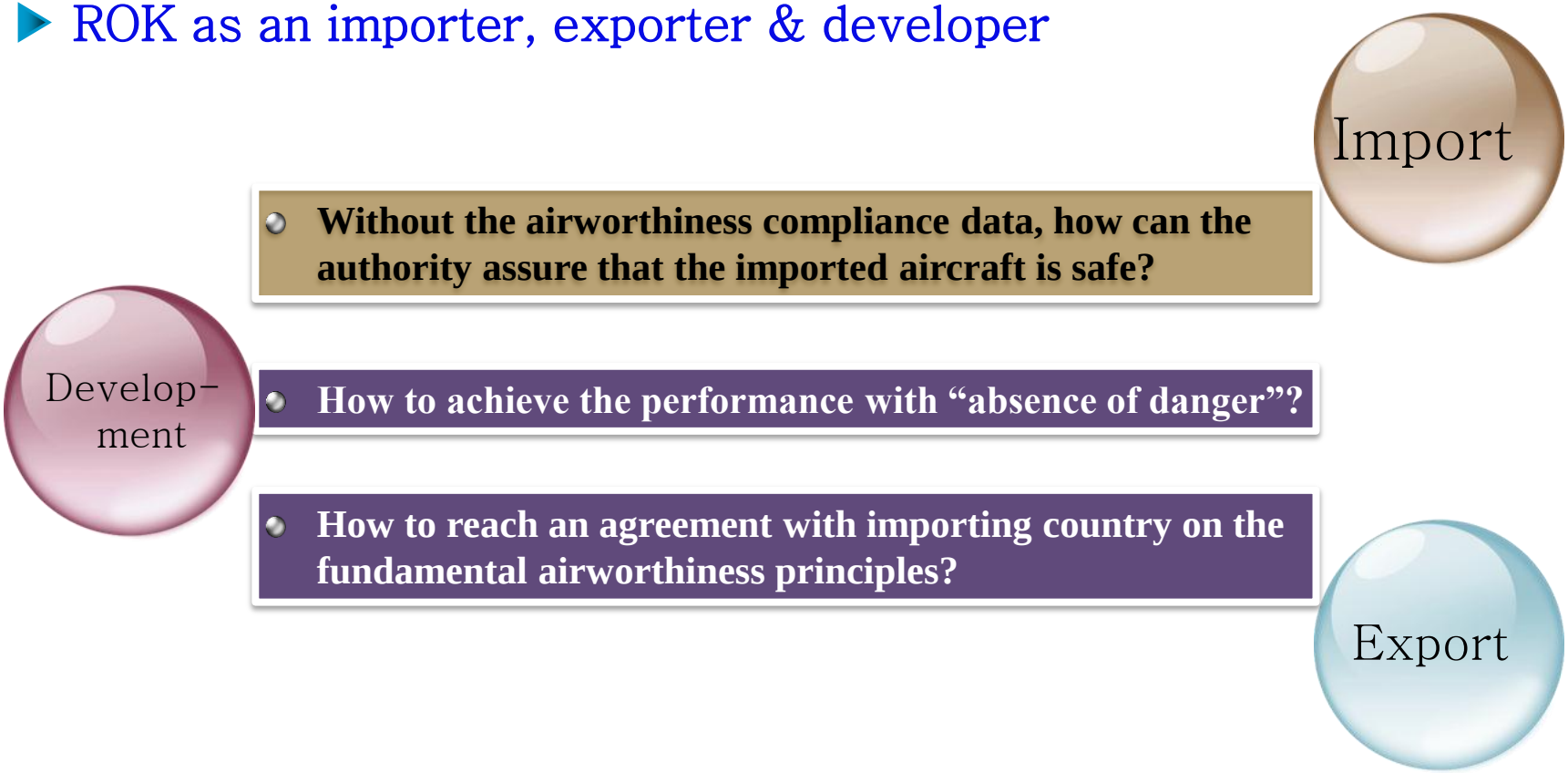
Lessons from an exporter standpoint

- **Increasing demand for A/C based on International airworthiness requirements.**
- **Difficulty to reach an agreement on the fundamental airworthiness principles**

⇒ Strengthen cooperation and close coordination between exporter and importer to enhance the flight safety

ROK A/W Lesson Learn (5/5)

- ROK as an importer, exporter & developer



In common, a definite and unchanging policy is that “Safety is paramount”

Proposal for the international community (1/2)

International cooperation status

- **Europe A/W system Harmonization**
  - 2008 MAWA(Military Airworthiness Authority) establish under EDA(European Defense Agency)
  - Purpose **:** Harmonized A/W system throughout whole military environment

- **NATO A/W system Harmonization**
  - Begin as a temporary group-chartered Working Group in 2010 under NATO Defense Agency)
  - Purpose **:** Establish integrated A/W system between member states and expand to the world

- **ASIC(Air and Space Interoperability Council) A/W activity**
  - Mar. 2011 A/W working group formulate in ASIC
  - Purpose **:** Process set for mutual recognition and exchange of A/W information among joining members

Proposal for the international community (2/2)

To ensure the international level of the airworthiness for the military aircraft

- A need for world-wide regulatory framework (Not an EU-wide regulatory framework)
  - **Feed-back from Asia for more improvement of requirements**

    * Conference, Seminar, Working Group, Task Force membership, etc
  - **Infrastructure building for global harmonized A/W system**

    - Global harmonization of military airworthiness standards, procedures and audit

- A need for flexible and adaptable airworthiness criteria to allow innovative technology
  - **Airworthiness certification of the current aerospace weapon system with the state –of-the art technology(** including a wide range of mitigation measures to reduce the risk of UAV operations)
  - **Enhanced military-Civil cooperation(** including the possibility for outsourcing of maintenance and repair to reduce time and costs)

Conclusion

To promote the level of international aviation safety throughout the world,
a seamless competition for the performance and **harmonized cross-border co-operation for the safety** is essential"

Fly Together!

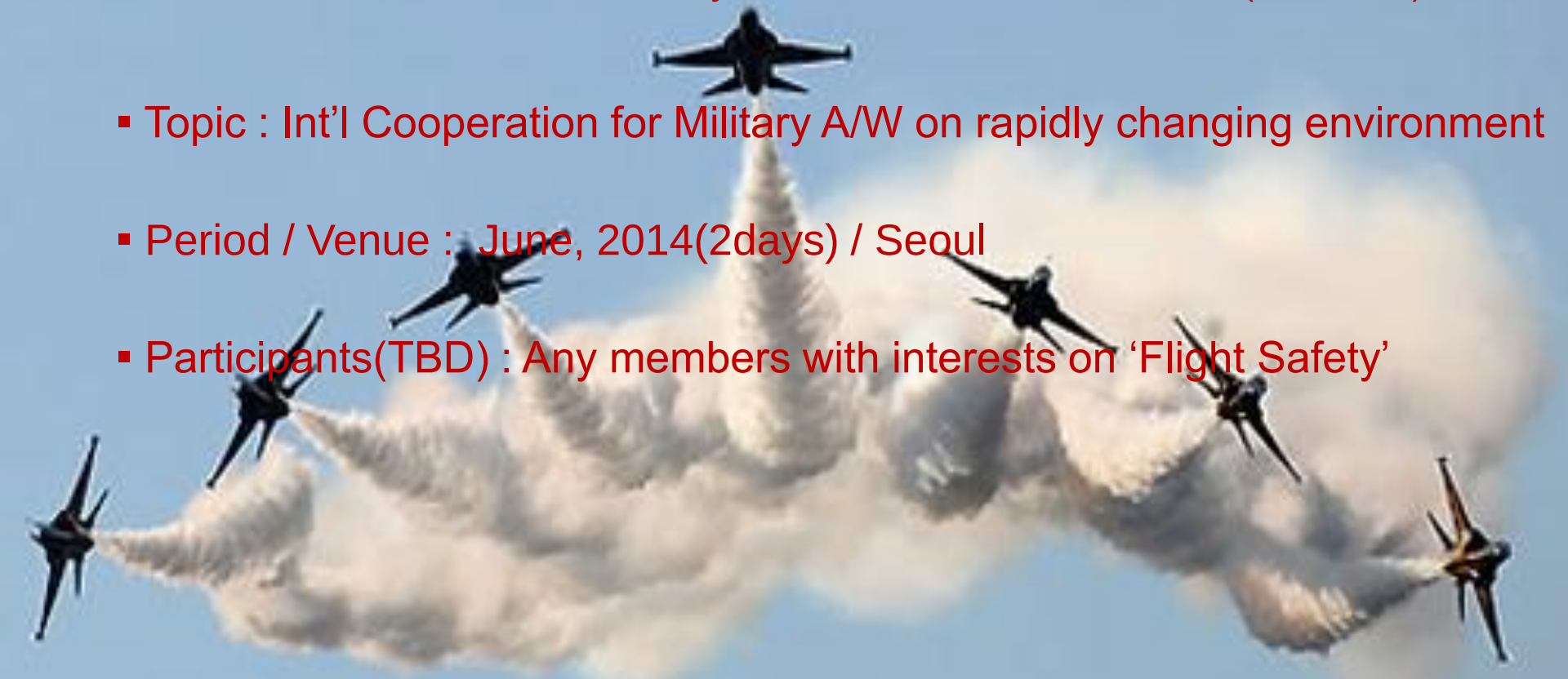
The airworthiness compliance data-sharing enables the importing country to make a determination of independent airworthiness and to ensure the operational safety during the service life.

To develop and export the military aircraft with international level of safety, the global regulatory framework is needed.

See you Next Year in Seoul!!

√ 2014 ROK International Military Airworthiness Conference(Biennial)

- Topic : Int'l Cooperation for Military A/W on rapidly changing environment
- Period / Venue : June, 2014(2days) / Seoul
- Participants(TBD) : Any members with interests on 'Flight Safety'



Looking forward to hearing from You!!!