



**MINISTERO DELLA DIFESA**  
Segretariato Generale della Difesa e Direzione Nazionale degli Armamenti  
Direzione degli Armamenti Aeronautici e per l'Aeronavigabilità

**PROCEDURE FOR MILITARY TYPE  
CERTIFICATION**

Edition: 09 March 2015

## LIST OF VALID PAGES

NOTE: This regulation is valid only if composed of the pages listed below and duly updated.

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The issue dates of the original and revised pages are:

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## 0. INTRODUCTION

The procurement of all military aeronautical systems is carried out by the DAAA which is responsible for both contractual and airworthiness aspects.

The Contract Agent is the DAAA competent Technical Division while the DAAA - VDT is the Airworthiness Authority.

The goal of the airworthiness is to ensure that each aircraft and its system are safe for both the aircraft occupants and the people living in the overflowed areas.

The airworthiness requirements are included in the airworthiness basis (called Type Certification Basis - TCB from now on and will be better defined in the chapter 1.4), included in the *Capitolato Tecnico*.

It is therefore essential that the process to be carried out with the maximum professionalism from all actors involved (e.g. certification authority, design company, maintainers fleet managers) keeping in mind that a mistake could have dramatic effects including loss of lives.

The Certification is therefore the process to evaluate the airworthiness of a system through the assessment of the design against the set of airworthiness criteria identified and then the assessment of the design against the safety objectives. It concludes with the issuing a Military Type Certificate (MTC) to assess the design.

Moreover DAAA has the task to verify the performance of the system acquired by the AD (Defense Administration) that are described in the Technical Specification, that typically is included in the *Capitolato Tecnico* as an attachment to the contract (*Capitolato Tecnico* describes in the Technical Specification all the performances including logistics and other requirements, the technical specifications and the Airworthiness basis are sections of *Capitolato Tecnico*).

The Qualification is therefore the process to evaluate the performance of a system and it concludes with the issuing a Military Type Qualification Certificate (MTQC) to assess the design.

To make a distinction between the assessment of the airworthiness and performance in this procedure the word "Certification" will be referred to airworthiness and the word "Qualification" to performance.

In some cases DAAA acquires aeronautical systems that can be installed generically on an aircraft. In this case DAAA will assess both airworthiness and performance of the stand-alone system using the Homologation process and issuing at the end the Military Homologation Certificate (MHC - Certificato di Omologazione Militare) that includes both performance and airworthiness. Afterword, in order to install the system on an aircraft the integration has to be assessed for each aircraft type.

The Type design consists of the drawings and specifications necessary to define the configuration and design features; information on material and processes and on method of manufacture and assembly of the product necessary to ensure the conformity of the product to the airworthiness basis and to technical specifications; an approved airworthiness limitation section and performance limitation section of

the instructions for continuing airworthiness and any other data necessary to allow the determination of the airworthiness and performances.

A MTC or MTQC or a MHC is issued to the company that made the request and from this moment it is considered the Certificate Holder. According to EMAR 21 it has to fulfill the following responsibilities:

- shall have a system for collecting, investigating and analysing reports of and information related to failures, malfunctions, defects or other occurrences which cause or might cause adverse effects on the airworthiness of the product, part or appliance covered by the type-certificate. Information about this system shall be made available to all known operators;
- shall make appropriate arrangements reporting to the issuing/approving Authority any failure, malfunction, defect or other occurrence of which it is aware related to a product, part or appliance covered by the type-certificate, and which has resulted in or may result in an unsafe condition;
- shall ensure collaboration between the design organisation and the production organization;
- shall retain all relevant design information, drawings and test reports, including inspection records for the product tested at the disposal of the Authority and in order to provide;
- shall maintain and update master copies of all manuals;
- shall furnish at least one set of complete instructions for continuing airworthiness, comprising descriptive data and accomplishment instructions prepared in accordance with the applicable type-certification basis, engine or propeller upon its delivery and thereafter make those instructions available on request.

The normal process is initiated by a request from the "user" (normally a Service Staff) to DAAA for the acquisition of a system.

This request will lead to a contract where both performance and airworthiness requirements will be specified in the *Capitolato Tecnico*.

As directed by AER(EP).P-6 the technical specification shall be divided into 3 sections:

- Part I "Technical Specification" defined and negotiated between DAAA-Technical Division and Company, based on the Operational Need issued by the Service Staff;
- Part II "Type Certification Basis" proposed by the company and negotiated with DAAA-VDT;
- Part III "Various prescription" consisting in all other requirements that does not fit in the previous (i.e. personnel Safety requirements for Remote Piloted Aircraft Systems (RPAS) ground station). The DAAA-Technical Division will verify these requirements.

During contract execution, the DAAA supervises the activities carried out by the Company through the design, up to the development and test.

At completion of the contract, before delivering the product, the company needs to obtain the Military Type Certificate (MTC) issued by the DAAA-VDT, proving the

compliance with the TCB and the Military Qualification Type Certificate (MQTC) proving the compliance with performance requirements (as designed).

After these certificates have been issued, the acceptance team will verify that the product delivered (as built) meet the type defined by the MTC and the MQTC.

According to the privileges granted to the company, based on the Military Design Organization Approval (MDOA) the DAAA-VDT will provide, a level of involvement will be defined.

Exceptions to MDOA will be evaluated only in special cases.

The procedure for providing the MDOA is described in AER(EP).P-10.

In some cases a design Company can request the certification of its product even if there is not an acquisition contract with the Italian MoD.

In this case a contract (Convenzione) has to be established between the Company and the AD in order to provide reimbursement to the DAAA for the certification effort.

In this case the same process will apply.

Aim of this document is to define the DAAA VDT internal process and procedures to carry on an Initial Certificate from the definition of the *Capitolato Tecnico* to the issuance of the Military Type Certificate and Military Qualification Type Certificate as per AER(EP).P-2.

Moreover the second part of the document describes the procedure to ensure the Continued Airworthiness during the lifetime of a program.

## I.1 Goal and Scope

This Paper describes the process used by “Direzione degli Armamenti Aeronautici e per l'Aeronavigabilità” (DAAA) to issue a Military Type Certificate (MTC) (for airworthiness), a Military Type Qualification (MTQ) (for performance) and Homologation (for systems) related to initial airworthiness as defined by the AER(EP).P-2. Moreover it describes the process to ensure continuous airworthiness is ensured during the operative life of the Weapon System.

The process applied by IT MoD is fitting the requirements as per EMAR-21.

## I.2 Referenced Documents

### I.2.1 ARMAEREO Regulations

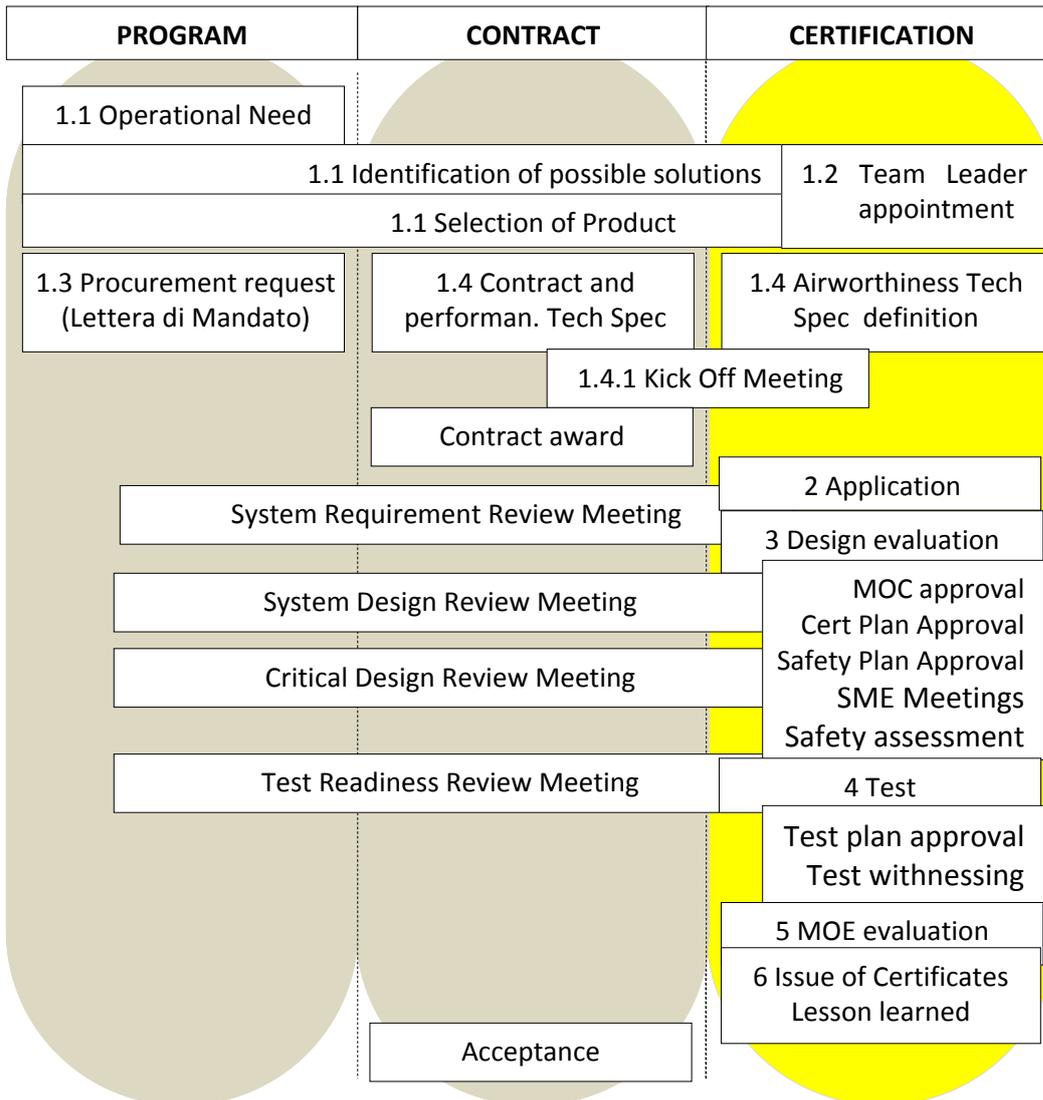
AER(EP).00-00-5	Controllo configurazione. Processi per l'elaborazione, valutazione, ed autorizzazione delle modifiche da introdurre nei materiali di competenza della D.A.A.A.
AER(EP).P-2	Omologazione, Certificazione e Qualificazione di Tipo Militare, Idoneità alla Installazione
AER(EP).P-6	Istruzioni per la compilazione dei Capitolati Tecnici per Aeromobili Militari

AER(EP).P-7	Norma per l'iscrizione e la tenuta del Registro degli Aeromobili Militari (R.A.M.).
AER(EP).P-10	Design Organization Military Approval
AER(EP).P-516	Criteri per la definizione dei Requisiti di Airworthiness
<b>I.2.2</b>	<b><u>NATO Standard</u></b>
STANAG 4671	UAV System Airworthiness Requirements (USAR)
STANAG 4701	Light UAV Systems Airworthiness Requirements
<b>I.2.3</b>	<b><u>MAWA Standard</u></b>
EMAR 21	Certification of Military Aircraft and Related products, parts and appliances, and design and production organisations
EMACC Guidebook	European Military Airworthiness Certification Criteria (EMACC) Guidebook

### **I.3 Definitions**

For definitions of abbreviations of words and phrases used in this PT reference must be made to the standard AER.Q-2010.

**1. INITIAL CERTIFICATION PROCESS**



**1.1. Operational need definition**

An operational need is defined by a Service Staff (customer from now on). In coordination with DAAA, the customer evaluates possible technical solutions to met its requirements until the final product is selected. Starting from this stage a number of meetings are organized between DAAA, company and customer to understand the need and evaluate the available technical solutions.

**1.2. Team Leader appointment**

As soon as the chief of the VDT1 receives a request from his chain of command, also informally at beginning, he appoints a Team Leader (TL) and a deputy that will participate to all meetings and will report to him.

The TL and deputy responsibilities are defined in attachment A.

Following his appointment, the TL establishes the certification team: this is a documented process, as per attachment B: in coordination with the Resource Manager, he analyzes the Curriculum Vitae Database (available in VDT) and he propose to the VDT1 chief a list of necessary SMEs (Subject Matter Experts) to accomplish the objective of issuing a MTC and a MTQC, assigning a SME to each discipline (or to multiple disciplines according to the complexity of the project).

In future the team may be increased or decreased in the number of SMEs according to a proportionate workload assigned to each person in the team. Anyway as principle, at least one reference SME for discipline should not change till the end of Certification.

#### **NOTE**

*The TL must pursue the fundamental role of a “coach manager”, listening to the needs of each member of the team and finding all feasible solutions to workload problems, to training needs, motivational issues, etc.*

*The TL, as soon as appointed, activates the MCT (Modulo Coordinamento Tecnico, a section of the VDT to coordinate all the technical activities) to prepare a file folding system on the server to save the certification evidences and meeting minutes.*

*The TL will be responsible for the communication and data flow making sure the MCT will receive all the information to keep the shared server updated.*

### **1.3. Procurement request**

After the operational need is consolidated the customer issues a formal mandate (Lettera di Mandato) to DAAA for the procurement of a system identifying the minimum required performance.

From this moment the DAAA is formally entitled to start the process to award a contract and a series of meeting with the company will start.

To be entitled to discuss with DAAA the company should demonstrate to be the designer of the system, in this case we will refer to a SDR (System Design Responsible), or at least the company has a formal delegation from the original SDR and has access to the design.

Later on in the process the appointment as SDR will be formalized.

### **1.4. Preparation of the TCB (Part II of *Capitolato Tecnico*)**

The DAAA Technical Division is in charge to prepare the contract and the performance technical specification (part I as per AER(EP).P-6) while the Type Certification Basis (TCB, part II as per AER(EP).P-6) responsibility is in the VDT1.

The TCB for a Military aircraft consist in:

- STANAG or CSs plus special conditions: if a set of requirements are available for the specific system (i.e. STANAG 4703 for fixed wing RPAS with MTOW < 150kg, STANAG 4671 for fixed wing RPAS with MTOW > 150kg, STANAG 4702 for rotary wing RPAS with MTOW > 150kg, STANAG 4746 for rotary wing RPAS with MTOW < 150kg, EASA CSs for civil derivative aircrafts) it

can be used as TCB. Special conditions can be added if the related code do not contain adequate or appropriate safety standard because it has a novel or unusual design, the intended use is unconventional, to cover military unique features or if experience from other similar products in service having similar design features has shown unsafe conditions;

- tailored AER(EP).P-516, (EMACC) or MIL-HBK-516C or latest version based on the Military use of the aircraft. The tailoring consists in identifying which criteria are applicable to the specific program and, for each of them, identify the standard to be used as listed in the AER(EP).P-516.

There could be different scenarios:

- the project can be a completely new one;
- the project can be a variation of an already available Military or civil product and therefore already certified (also partially) by a recognized Airworthiness Authority (see EMAD – R for details on the process to recognize another Airworthiness Authority) and therefore already designed using a specific airworthiness code.

In this last case the TL can consider the possibility to reuse the work already accomplished by the company taking into account the set of applicable airworthiness codes, the assessment of the validity for the military use of the product, the delta Military requirements (the SDR should consider potential need for Exemptions and/or Special Conditions in order to take into account the military use of the system and/or peculiar design features not covered by the codes) should be evaluated.

Then AER(EP).P-516 will be used as a check-list to verify the comprehensiveness of the TCB.

More details on the process to build a TCB can be found in the EMACC Guidebook.

The agreement of the TCB requires a number of meetings between VDT1 and company SME and typically it takes between 1 and 4 months, depending on the complexity of the project.

The acceptable Means of Compliance (MoCs) to demonstrate that the requirement is met are:

0. Declaration of compliance
1. Description
2. Analysis
3. Safety Analysis
4. Lab Test or Rig Test
5. Aircraft Ground Test
6. Aircraft Flight Test
7. Inspection
8. Simulation
9. Equipment Declaration of design and Performance (DDP)
10. Similarity

AER(EP).P-2 Attachment F provides more details.

MoCs should be agreed before contract signature to help the company to provide a more accurate cost estimate. Since the agreement comes from a long negotiations, in some cases it can be accomplished after the contract award but no later than the beginning of the design evaluation phase.

#### 1.4.1. Kick-off Meeting

The certification team and the company will have a Kick-off Meeting (KoM) as soon as the draft TCB is proposed by the company.

The objectives of this KoM are:

- familiarization of the Certification Team with the system (history of the program, basic architecture, basic technical description, etc);
- agree on the principles of the TCB (e.g. version of codes, legacy TCB when applicable, amount of similarity when applicable – a consideration should be given to use always the latest standard, proposed Special Conditions to be defined, Exemptions asked by the company, etc);
- establish plans and schedules to define the TCB prior to Contract Signature (list of topics to be solved, identification of top priority issues, schedule of next meetings, etc);
- establish plans and schedules to obtain MDOA.

According to the complexity of the program, the KoM may take more than one day in order to accomplish the above mentioned objectives.

After the KoM several other meetings may be necessary to agree the TCB between the company and the certification team.

These meetings may address specific technical areas that require the definition of Special Conditions or Exemptions.

These meetings may be very specific and made just between the Subject Matter Experts (SMEs) of the Company and of the Certification Team, with or without the involvement of the Certification Team Leader.

#### **NOTE**

*According to AER(EP).P-2 the TCB may be updated also during the certification phase if deemed necessary by the VDT1.*

The complete tailored TCB will be defined prior to Contract and will be attached to it.

The anticipation of this significant effort in the earliest phases facilitates the certification activity afterwards and reduces the risk of not accomplishing the MTC release objectives by the scheduled date.

After both Airworthiness and performance specifications have been agreed, the contract can be signed by the contract authority.

## **2. APPLICATION**

As first formal act the company has to be designated as the System Design Responsible (SDR) demonstrating it has access to all the drawings and it has the intellectual property of the system or has a license agreement with the original designer.

As per AER(EP).00-00-5, the company is responsible for design changes and for the content of all the documentation issued.

The appointment of the SDR is made through a PTD (Prescrizione Tecnica Ditta - example form in AER(EP).00-00-5) issued by the company and approved by the Technical Division by issuing a PTA (Prescrizione Tecnica Applicativa) as defined in AER(EP).00-00-5.

After contract signature the Contractor issues a formal request to VDT1 for 2 applications, the first for the MTC and the MTQC (example form in attachment C), the second application for the MDOA.

It can be very rare cases to be agreed by the VDT1, in which the MDOA is not required or it will be required later.

For a change to an existing system the company can apply for an amendment to existing Type Certificate if the Authority finds that the change in design, configuration, power, thrust, or mass is not so extensive that a substantially complete investigation of compliance with the applicable type-certification basis is required.

In this last case the process will be described in the Continuous Airworthiness section of this document. Otherwise a new Type Certificate has to be issued.

For an aircraft that does not meet all the requirement in the applicable TCB ensuring adequate level of safety, and therefore a restricted TCB only will be assessed, restrictions may be imposed in regards to the intended use of the aircraft.

In this case a Restricted Type Certificate will be issued.

Engine or propeller or both, if installed in the aircraft shall have a Type Certificate issued showing compliance with the applicable TCB defined by the DAAA.

The aircraft MTC holder is responsible for the integration of products, weapons and other systems onto the aircraft.

The MTC or Restricted MTC have an unlimited duration and remain valid until the holder remains in compliance with DAAA rules or the certificate is not being surrendered or revoked by DAAA.

The type Certificate holder shall commit to inform DAAA as soon as practical, when it is no longer able to meet its responsibilities defined in EMAR 21.

The MDOA application will be issued as described in AER(EP).P-10.

The company will demonstrate having a structure completely independent from the design organization, able to verify both performance and airworthiness requirements through a number of skilled MCVE (Military Certification Verification Engineers).

Based on to the assessment carried out by VDT1 some privileges will be given to the company.

The application shall have as attachment the Design Organization Exposition (DOE) (table of content in attachment D).

The MTC/MTQC application (see Attachment C) will contain as attachments or reference:

- Reference to the TCB in the Contract;
- Reference to the PTA for System Design Responsibility nomination;
- Reference to the MDOA released by the DAAA or other recognized authorities (the MDOA process can also not be completed yet in this case the company will provide the reference to the application);
- The proposed Certification Program Plan (CPP), including the Means of Compliance (MoC) for both Airworthiness and Performance requirements, the resources to put in place and a time schedule proposed by the Company to accomplish the Certification tasks. (minimum content in attachment E);
- The proposed Safety Plan where the company defines the approach to meet the safety requirements (minimum content in attachment F).

Within 3 weeks from the application the TL will held the first certification meeting.

The application information is the meeting entry criteria; exit criteria are:

- a set of agreed milestones including but not limited to:
  - the approval by DAAA of the CPP, including the MoC;
  - first flight readiness review (when applicable);
  - main tests schedule;
  - certification reports schedule;
  - MDOA audit schedule and final approval;
- the planning of specialist panels (number of panels, frequency of panel meetings, etc);
- the schedule of a familiarization course for the Certification Team SMEs (when needed);
- clear definition of the Point of Contacts among SMEs of the company and VDT1 and between the VDT1 TL and the team leader in the Company Airworthiness Office;
- definition of the Level of Involvement (LOI)<sup>1</sup> of the Certification Team, based on the knowledge of the Company, on the DOE, on historical safety reports of other programs of the same Company, etc.. The LOI means the agreement of the following:
  - test to be witnessed by the certification team SMEs;
  - plan of number of certification audits and definition of the main topics to be addressed in each one;

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<sup>1</sup> According to the privileges given to the MDOA, to the complexity and maturity of the project and to the lesson learned from previous programs, the TL will identify the Level of Involvement in the different development and test activities carried out by the company

- means of evidence (MoE) to be checked not only by the independent checking function of a MDOA approved Company, but also by the certification team SME;
- etc.
- any other business deemed necessary by the TL and the Applicant.

#### **NOTE**

*Each meeting (or meaningful group of meetings) needs a formal minute agreed by both parties. The minute must clearly identify all the Action Items in a dedicated section.*

*The Action Item should be identified in a way that clarifies the meeting that originated the Action (eg 516-AFR.2.4 may mean the 4th Action Item issued in the Airframe specialist Panel Meeting #2 of the 516 program).*

*Each meeting should start from the review of the Action Item List.*

### **3. DESIGN EVALUATION**

The Applicant and the SMEs start executing the Certification Plan, the SMEs Panel meetings, the testing activities according to the Means of Compliance agreed in the TCB and the technical specification, the witnessing activity, the assessment of planned MoEs.

If the MoCs have not been agreed before the contract signature, they have to be agreed in this moment.

The TL makes sure that the Logistic Command for Air Force assigns to the program a MDS (Mission Design Series) according to AER(EP).0-0-12. The request should contain the desired MDS, Production Company and Popular name. The TL calls for certification program meetings (or teleconference) on a monthly basis normally, but the frequency of these meetings may change according to the progress being made or to the difficulties that might be encountered in the execution phase.

The objective of the meeting is to assess the system design, execution phase progress, milestones achievements, potential delays, potential technical issues, potential updates to the plans, draft reports.

For a new development this phase happens during the design of the system.

So during the discussion the DAAA SME will assess the system design against the set of airworthiness requirements listed in the Certification Basis and in case will require changes to meet airworthiness or performance criteria until the final configuration is defined.

If the system is already developed the configuration has to be declared in order to allow VDT1 SME to assess the applicability of the documentation provided.

The company must deliver the documentation to be discussed in the meeting at least 2 weeks in advance. The DAAA-VDT certification team will review the documents and will provide comments using the form in "attachment G" within 1 week prior to the meeting.

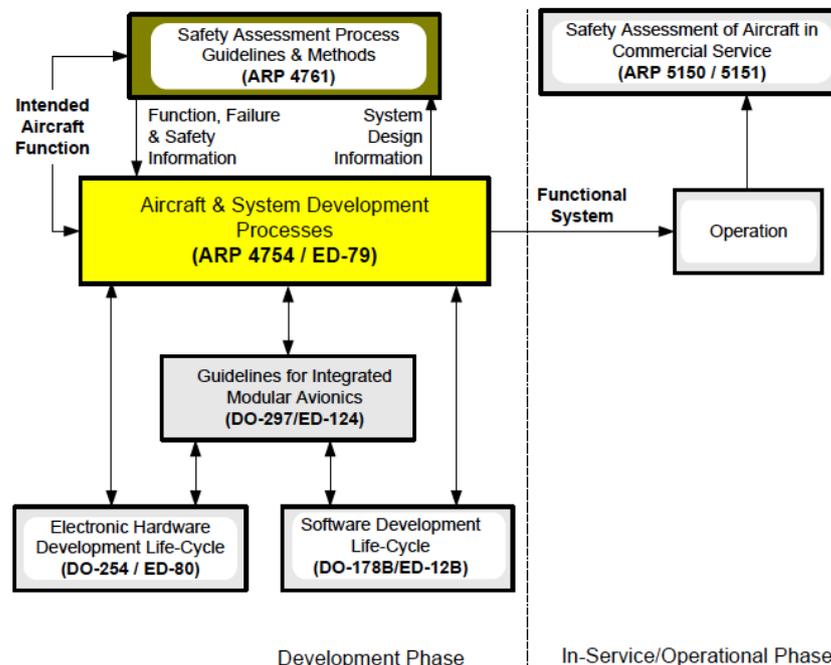
The comment sheet will be the starting basis of the discussion.

### 3.1. SAFETY

Safety is a special discipline that involves specific knowledge of all the subsystems and of the tools used for the assessment (eg FHA, FMECA, FTA, Zonal, etc.) and it starts since the very beginning of the design.

The assessment of the safety plan by VDT1 has the purpose of getting confidence in the processes and tasks that in the Company are performed in order to accomplish the safety objectives. An acceptable process is the one described in the ARP-4761 or in the Mil-HBK-882E

The safety objectives are identified in the TCB, typically they are listed under the 1309 code for non systematic failures<sup>2</sup>. To be protected against systematic failures<sup>3</sup> that are particularly relevant for complex systems, the ARP 4754A have to be followed.



Guideline documents covering development and in-service/operational phases (ARP 4754)

The TL identifies the way the Safety SMEs should interact with the SMEs of each specific system in order to perform a thorough assessment of the safety evidences produced by the Applicant.

For this purpose it is recommended to plan dedicated safety meetings (Certification Safety Reviews) where competences across expertise in the safety field and the various systems disciplines are shared.

These meetings may be held only among DAAA SMEs or with the invitation of the Applicant when needed.

<sup>2</sup> Failure associated with physical degradation of a component

<sup>3</sup> Systematic event: An event that can be due to faults in specifications, design, construction, operation or maintenance of the system or its component. DEF-STAN 0056

Systematic failure: an undesired state of a system that is not associated with physical degradation of a component that results from a given set of conditions being satisfied

According to the ARP 4761 process, a Functional Hazard Assessment (FHA) is conducted at the beginning of the aircraft/system development cycle. It should identify and classify the failure condition(s) associated with the aircraft functions and combinations of aircraft functions. These failure condition classifications establish the safety objectives.

The output of the FHA is used as the starting point for conducting the Preliminary System Safety Assessment (PSSA).

The PSSA is a systematic examination of the proposed system architecture(s) to determine how failures can cause the functional hazards identified by the FHA. The objective of the PSSA is to establish the safety requirements of the system and to determine that the proposed architecture can reasonably be expected to meet the safety objectives identified by the FHA.

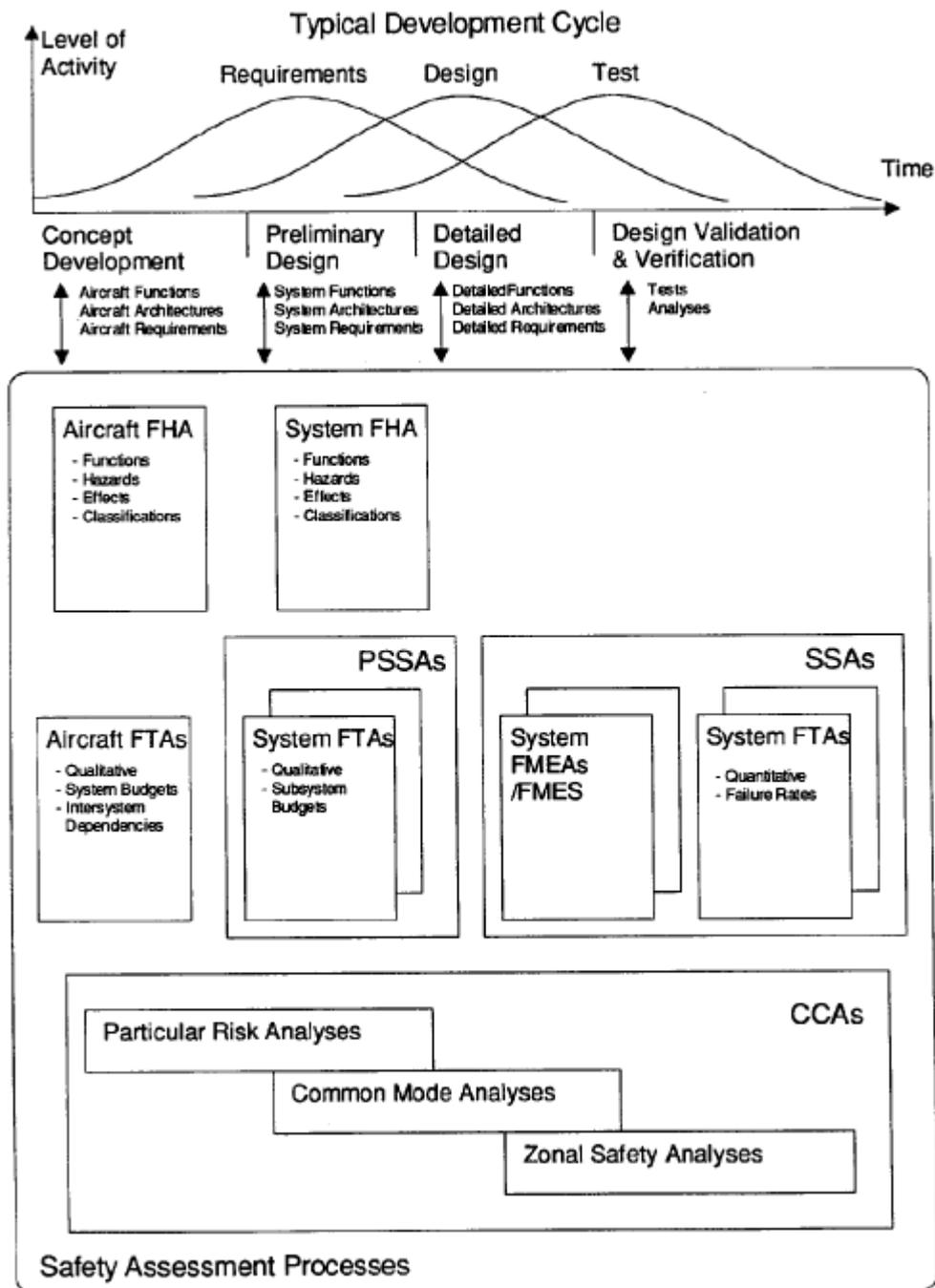
The System Safety Assessment (SSA) is a systematic, comprehensive evaluation of the implemented system to show that safety objectives from the FHA and derived safety requirements from the PSSA are met.

A Common Cause Analysis (CCA) should support the developments of the specific system architecture and related systems by evaluating the overall architecture sensitivity to common cause events. These common cause events are evaluated by performing the following analyses: particular risk analysis, zonal safety analysis, and common mode analysis. The results of aircraft level common cause analyses are fed into the PSSA and SSA for each system.

Consideration should be given to human factor, electromagnetic protection from internal and external sources.

The safety assessment process is complete when the SSA results are verified against the system level and aircraft level FHAs.

Due to the highly complex and integrated nature of modern aircraft systems a development assurance process, which establishes confidence that system design has been accomplished in a sufficiently disciplined manner to limit the likelihood of development errors that could impact aircraft safety, has to be implemented, as described by ARP 4754A.

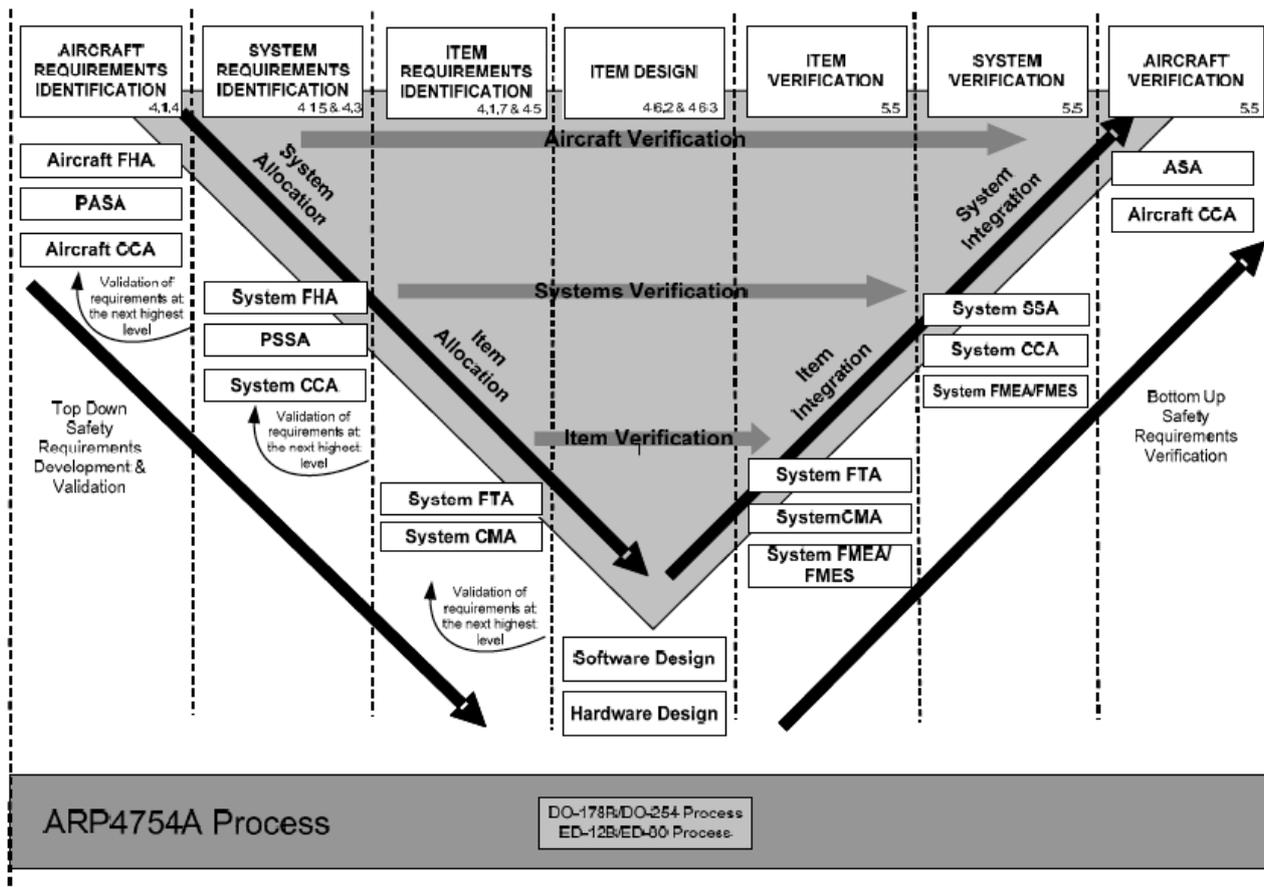


Overview of the safety process assessment (ARP4761)

The final report issued by the company will describe the overall safety of the system as the result of the different analysis performed.

Moreover the final report will provide the cumulative probability of a catastrophic event as the sum of the probabilities of occurrence of all identified failures that can lead to a catastrophic event.

This value shall meet the requirements listed in the AER(EP).P-6.



Interaction between safety and development processes (ARP 4754A)

#### 4. TEST

Once the design is completed and the configuration of the system reached a maturity sufficient enough, the test phase can begin to show compliance with the TCB and the technical specification in accordance to the agreed MOC.

By this moment the configuration of the system will be defined through a Configuration Definition Document providing all hardware and software part numbers.

The applicant proposes a test plan that will be evaluated by the TL and accepted.

Before each test is undertaken, the applicant shall ensure for the test specimen that:

- materials and processes adequately conform to the specifications for the proposed type design;
- parts of the products adequately conform to the drawings in the proposed type design;
- the manufacturing processes, construction and assembly adequately conform to those specified in the proposed type design;
- the test equipment and all measuring equipment used for tests are adequate for the test and are appropriately calibrated.

If needed the applicant requires the issuance of a prototypical mark, in case of a newly developed system, or an experimental, in case of a change to an existing configuration, in accordance to AER(EP).P-7.

The company will provide an application for the permit to fly including:

1. The purpose(s) of the flight(s);
2. The ways in which the aircraft does not comply with the applicable airworthiness requirements;
3. The flight conditions approved;
4. The documentation supporting these conditions;
5. A declaration that the aircraft is capable of safe flight under the approved flight conditions or restrictions.

The Flight conditions shall include the configuration for which the permit to fly is requested and any condition or restriction necessary for safe operation of the aircraft, including:

1. The conditions or restrictions put on itineraries or airspace, or both, required for the flight(s);
2. The conditions and restrictions put on the flight crew to fly the aircraft;
3. The restrictions regarding carriage of persons other than flight crew;
4. The operating limitations, specific procedures or technical conditions to be met (which may include the restrictions regarding carriage/release/firing of weapons);
5. The specific flight test program (if applicable);
6. The specific continuing airworthiness arrangements and the regime under which they will be performed.

The substantiation that the aircraft is capable of safe flight under the above conditions or restrictions and the method used for the control of the aircraft configuration, in order to remain within the established conditions shall be specified in the application.

The approval of the flight conditions can be made by a MDOA with privileges except for initial flights of a new type of aircraft or an aircraft modified by a significant major change or whose flight and/or piloting characteristics may have been significantly modified; or an aircraft dedicated to open a non-conventional flight envelope. In this case VDT1 will approve the flight conditions.

The VDT1 will then issue the permit to fly when, through its own investigations, which may include inspections, or through procedures agreed with the applicant, is satisfied that the aircraft conforms to the design defined under the flight conditions, before flight.

If the flight conditions are not related to the safety, a MDOA or MPOA with privileges can issue the permit to fly.

The validity of the permit to fly will be subject to Compliance with the conditions and restrictions associated to it.

Once the applicant will have satisfied all the above requirements, the request for experimental / prototype tale number can be submitted to VDT2.

The applicant shall make the flight test VDT1 finds necessary, conducted in accordance to the conditions approved.

For aircraft incorporating turbine engines of a type not previously used in type-certificated aircraft, at least 300 hours of operation should be collected or as agreed by DAAA, with a full complement of engines that conform to a type-certificate; and for all other aircraft, at least 150 hours of operation or as agreed by DAAA.

In addition to what specified in AER(EP).P-2 (§2.8), the witnessing activity has to be performed in accordance to the Level of Involvement established between the VDT1 and the Applicant.

Experience has shown that attending the most crucial tests (e.g. Full Scale Static Tests, Full Scale Fatigue Tests, Flight Loads Survey, Flutter Flight Tests, Software Reviews, Handling Qualities Flight Tests, etc) allows VDT1 to have a better confidence in the design and reduce the time to assess and approve the following reports.

## **5. MOE EVALUATION**

For each requirement listed in the TCB and in the Technical Specification, the applicant has to demonstrate compliance issuing a MOE (Means Of Evidences) that typically is a document describing the activities carried out (according to the MOC).

During the certification process the team collects and evaluates them and, when they are considered mature enough to provide compliance, they are approved.

The company will provide the assessment of its MCVE for each MOE and the VDT1 SME will use this assessment according to the level of involvement defined. Formal approval will be provided through the approval of the Verification Compliance Matrix discussed later.

Each MOE shall clearly show that the data they contain have been verified and approved according to the company process.

As soon as a not compliance related to both airworthiness and performance requirements will be identified, the TL will inform the VDT1 chief and the contract manager providing information on the consequent limitation to keep customer informed.

Two final Verification Compliance Matrices, one for performance (attachment H) and one for the airworthiness (attachment I), shall provide, for each requirement, the reference to the document that summarize the evidences to show compliance and the list of the not compliances if applicable.

The Applicant must issue all the necessary Reports at least 3 weeks in advance, in order to give the certification team sufficient time for the final assessment.

For all not compliances a resolution should be defined such as a mitigation or a limitation on the system operation in order to maintain the acceptable level of safety.

A clear traceability to the non compliance disposition shall be included in the Verification Compliance Matrices.

A final certification meeting will be held, chaired by the TL, in order to verify closure of all Action Items and all open technical issues.

The SMEs for each discipline will prepare a Summary Report of the certification activities performed with the following minimum information provided:

- description of the Level of Involvement for the specific system,
- short summary of significant activities performed,
- identification of all not compliances and its disposition,
- identification of any potential residual risk and its classification as Low/Medium/High,
- list of applicable reports,
- any other information that might be necessary.

All the Performance Not Compliances will be reported to the contract agent for acceptance/penalties definition.

For all the Airworthiness Non Compliances the TL will evaluate if a limitation have to be imposed and will report to the contract agent.

Before the completion of the program the applicant must submit the draft Technical Publications prepared in accordance to AER.0-0-2.

The TL will verify that the publication includes the full list of limitations imposed during the certification process while the DAAA-Technical Division will insure the acceptance process defined by AER(EP).0-0-2 will be applied.

## **6. ISSUE OF CERTIFICATES**

At the completion of the certification process the Applicant shall provide to VDT a CD or other electronic media containing the Verification Compliance Matrices and all the documentation referenced (If some documents are covered by intellectual property restrictions, they are not required to be delivered but have to be available to DAAA SME for review at the contractor facilities).

Moreover the applicant shall provide a Declaration of Compliance to Airworthiness requirements (template in attachment L).

The applicant shall keep all relevant design information, drawing and test reports including inspection record at disposal of DAAA in order to ensure the continued Airworthiness for all life of the fleet and 10 years after the disposal of the last aircraft.

Based on the documents and all the MOE collected, the VDT1 will issue the Military Type Certificate and Military Type Qualification Certificate (for template see attachment A of AER.P-2).

Attached to the MTC will be a Data Sheet (minimum content see attachment E of AER.P-2) including the main features and limitation of the system (including engine, propeller and APU). The datasheet will contain performance and limitations, no configuration information since they are included in Configuration Definition Document.

The datasheet is prepared by the TL, with the support of the SMEs and of the Applicant as necessary.

It will include as appendix 1 "Non Compliances" all airworthiness and performance requirements listed in the Technical Specification not complied with or not demonstrated.

The summary of the certification activities carried out is described in the Certification Report (template in attachment M).

This is the only report typically issued in Italian language since it is an internal document describing the certification approach, the methodology applied, the activities carried out and any findings.

When the datasheet and the Certification Report have been completed the MTC and MQTC can be submitted to the Technical Vice Director for signature.

## **7. LESSON LEARNED**

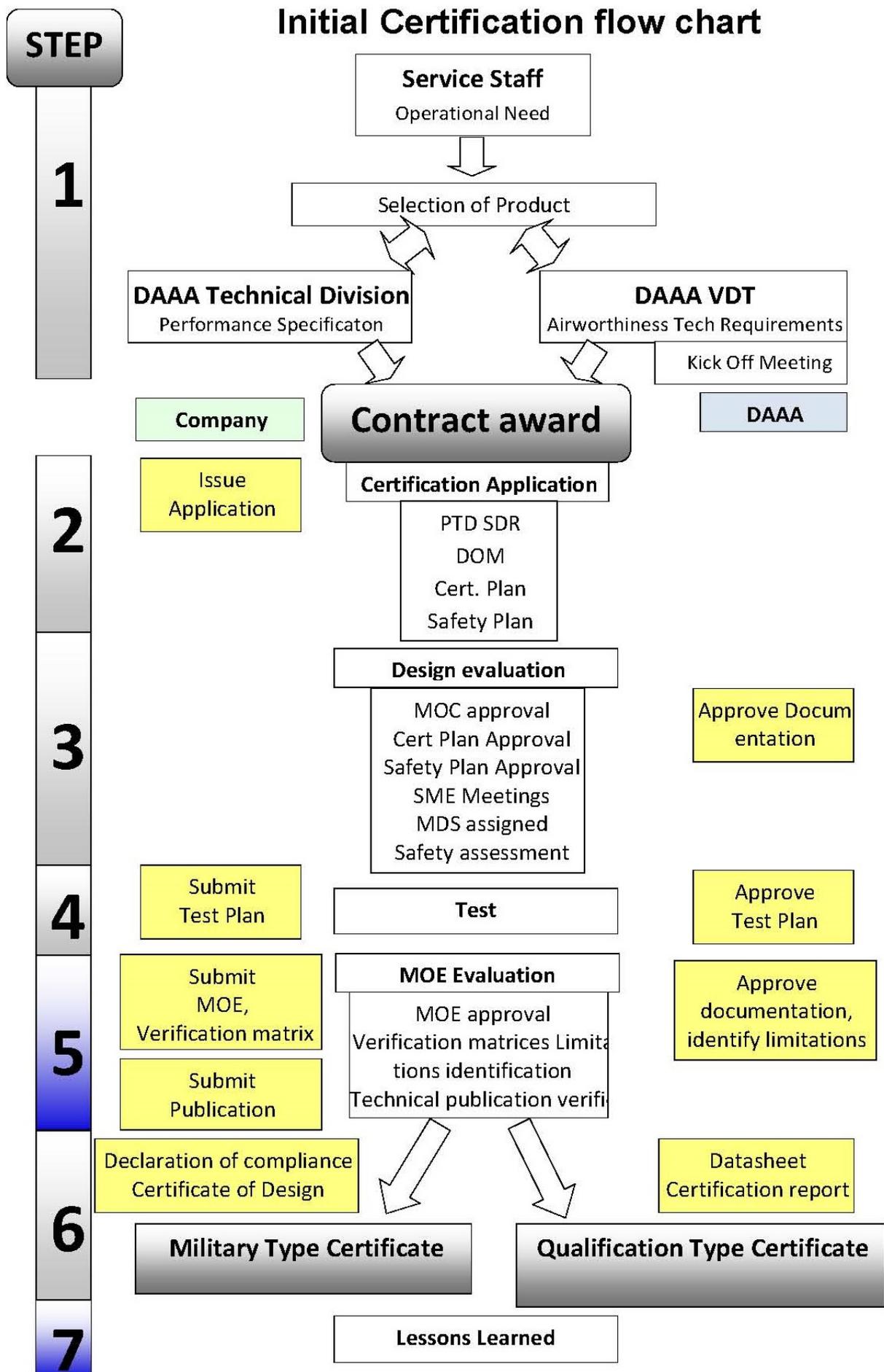
During the certification process the TL will keep an issue log recording all problems identified and its resolution.

Within one month after the signature of the certificates, the TL shall convene a final meeting with all the SME involved in the certification and identify all lessons learned.

The outcome of the meeting will be included in a document that will be signed by the VDT1st chief and kept in the library by MCT.

According to the level of the lesson learned the VDT1 chief will decide to send the document to all other VDT1 members and to the company or to organize also a meeting with them to discuss the main items.

The VDT1 chief could require to revisit this procedures according to the experience of a program.



## TEAM LEADER RESPONSIBILITIES

Team Leader responsibilities:

- Be the primary interface with the applicant for all activities related to the certification and qualification. The communication between DAAA SME and applicant SME can be direct but the TL shall be always be in cc.
- Prepare status for the VDT 1 Head and keep him up-to-date periodically.
- Define SME resources needed for all planned activities.
- Coordinate the activities of the SME having periodical status meetings.
- Keep the shared calendar updated with all events related to the certification and qualification activities.
- Making sure that the MCT (Modulo di Coordinamento Tecnico) receives all the official documentation, stores on the share drive and makes available to all SMEs.
- Monitor the contractual certification milestones and alert the VDT1 Head as soon as he has the feeling that some of them will not be met.
- Immediately inform the VDT1 Head and the contractual agent as soon as a non compliances are discovered.
- Prepare all the documentation to be signed by the VDT 1 Head.

Deputy Team leader responsibilities

- Assist the Team leader in all its duties
- Be updated on the status of the program to be ready to replace the Team Leader in any event if he is unavailable
- Carry out all the activities delegated by the Team Leader

# CERTIFICATION TEAM APPOINTMENT

## CERTIFICATION TEAM APPOINTMENT

DISCIPLINE	Name	Requirements (EMACC chapter/STANAG UL, etcc..)
1 GENERAL AIRBORNE SYSTEMS		
2 VIBRATION AND NOISE ANALYSIS ACUSTICS		
3 AIRFRAME - STRUCTURE - LANDING GEAR		
4 OXYGEN - ICE AND RAIN PROTECTION - WINDSHIELD AND CANOPY – ROLE EQUIPMENT - EMERGENCY EQUIPMENTS		
5 AUTO FLIGHT - FLIGHT CONTROL – FLYGHT TECH		
6 AVIONICS (COM-NAV-IDENT-SURV-RADAR)		
7 ELECTRICAL POWER - LIGHTS		
8 HYDRAULIC POWER - FIRE PROTECTION – PRESSURIZATION – ENVIRONMENTAL CONTROL SYSTEM		
9 DIAGNOSTIC SYSTEM		
10 POWER PLANT INTEGR - ENGINE - PROPELLER - APU - FUEL		
11 DEFENSIVE SYSTEM – ARMAMENTS – SAFE SEPARATION		
12 SOFTWARE		
13 E3		
14 ENVIRONMENTAL		
15 SAFETY - RELIABILITY MANTENABILITY TESTABILITY		
16 HUMAN MACHINE INTERFACE		
17 HANDLING QUALITIES – PERFORMANCES - CREW SYSTEMS		
18 GROUND CONTROL STATION		

Date

The 1<sup>st</sup> Office Chief

# CERTIFICATION APPLICATION

**To** MINISTERO DELLA DIFESA  
Segretariato Generale della Difesa e Direzione Nazionale degli Armamenti  
Direzione degli Armamenti Aeronautici e per l'Aeronavigabilità  
Vice Direzione Tecnica – 1<sup>^</sup> Ufficio

**Subject:** XXX program – Application for Military type Certification and Qualification

Reference:

- a. contract xxx
- b. *Capitolato Tecnico*
- c. PTA xxxx SDR

In accordance to AER(EP).P-2 requirements, hereby XX (name of the Applicant) applies to DAAA Vice Direzione Tecnica 1<sup>st</sup> Office, for granting of Military Type Certificate and Qualification Certificate for the XXX (name of the system).

The system, acquired by the Italian Mod in accordance to the contract at reference a, will be developed according to the *Capitolato Tecnico* at reference b, including performance and airworthiness requirements.

The XX (name of the system). is designed by the XX (name of the design company) that has been recognized as System Design responsible with the document at reference c.

The XX (name of the design company) is meeting the requirements for a Military Type Certificate holder, as per AER.P-21 subpart B, and has been approved (or applied for approval) by this DAAA for a Military Design Organization Authority for XX (name of the system).

The certification will be carried out according to the certification program plan in attachment A and the safety plan in attachment B.

For any clarification and information please contact...

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# DOCUMENT COMMENT SHEET



# QUALIFICATION COMPLIANCE MATRIX



# CERTIFICATION COMPLIANCE MATRIX



## DECLARATION OF COMPLIANCE

# Statement of Compliance of the XXXXXXXXXXXX

P/N

Document Reference No.	xxxxxx
Issue	xxxxxx
Aircraft Type:	xxxxxx

## References

1. Technical Specification
2. Airworthiness Basis
3. AER(ep).P-2 Em1
4. Certification Program Plan
5. Safety Plan
6. Certification Application
7. Qualification Compliance matrix
8. Certification Compliance Matrix
9. Type Design configuration
10. Safety Assessment Report
11. Software Standard

This Statement of Compliance (SoC) is applicable to XXXXX

The company XXX designers of the XXXX

### **declares that**

The system XXXXX in the "as designed" configuration defined in reference 9

### **Complies with**

- The Technical Specification in Reference 1
- The Airworthiness Basis in Reference 2

With the exceptions and limitations stated in Attachment A,

The activities proving compliance with aircraft Specification and Airworthiness Basis are collected in references 7 and 8 including limitations, demonstrated functionalities, and any or all deviations.

This documentation proves that the system PN XXXX is airworthy and safe (based on the assessment at Reference 10), provided that it is used and maintained in accordance with the instructions and limitation defined in the applicable manuals.

The calculations made during the course of the design have been checked and every reasonable precaution taken to ensure their accuracy.

The design data, calculations, reports on tests and lists of drawings supplied referred to, references 7 and 8, are true and accurate records of the design.

With the exceptions stated in Attachment A, all supporting documentation, have been received or reviewed.

Modifications to all operating procedures, limitations and maintenance instructions, derived from the technical qualification activities are incorporated into the relevant technical manuals.

With the exceptions stated in Attachment B, compliance with the flying performance, including handling qualities, defined by the above Specification, has been demonstrated by flight tests covered by the reports in Attachment C, when the aircraft is operated in accordance with relevant technical manuals.

Being the holder of the Military Aircraft Type Certificate issued by the Italian Ministry of Defence, Directorate of Aeronautical Armament and Airworthiness, the company assumes the associated responsibilities as regards as: configuration control, filling the documentation, preparation of the manuals and instructions for maintaining the airworthiness status.

**Attachments:**

A Exceptions and Limitations.

B Flying performance characteristics, including handling qualities, which have not been demonstrated by flight tests.

C Evidence of Structural Integrity

Date

Signed

Chief Engineer

# RAPPORTO TECNICO DI OMOLOGAZIONE



**MINISTERO DELLA DIFESA**

**Segretariato Generale Difesa / Direzione Nazionale degli Armamenti  
Direzione Armamenti Aeronautici e per l'Aeronavigabilità  
Vice Direzione Tecnica  
1° Ufficio**

**RAPPORTO TECNICO DI OMOLOGAZIONE**

**N° XXXX**

***Velivolo:* XXXXXX**

**PN: XXXXXX**

**Documento di Configurazione: XXXX**

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DATA

FIRMA  
IL COMPILATORE  
(xxxxxx)

Il Capo del 1° Ufficio  
(xxxxx)