RPAS
SAFETY SERVICES

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Operational Safety (O.S)

O.S services have been designed to assess potential hazards and related risks before performing a determinate activity, assuming a safe operation with a reduced probability of harm to third parties as well as the environment.

① Documentary development support service

On-site and remote support in the development of the required documents to flight in the European airspace according to the applicable national legislation and European recommendations.

② Documentary verification and validation for flight operations' authorization

Verification and validation of the technical dossier before its presentation to the competent authority.

③ Operational risk assessment

- According to mandatory methodologies included in the National legislation of application (open and specific category).

- ***SORA*** proposed by JARUS for specific category operations and included in the future European regulatory framework developed by EASA as the official risk assessment methodology for the European Union. ALTER is already applying this method for RPAS operations.

- **Mitigation measures' identification** to ensure a safe operation, mitigation measures are proposed based on European specifications and recommendations.

- **Flight tests verification and validation (V&V)** of the performance of the RPAS by completing an operational test flight.

- **RPAS Operational safety internal audits** Documental and technical inspections according to the activities performed by the customers, conducted in accordance with National or European standards. A Operational Certificate of Compliance is provided.

Why?

- ✓ Improvement of the quality of the drone operational services
- ✓ Optimization of operational efficiency
- ✓ Minimization of liability risk
- ✓ Reduction of NC probability in official inspections (Operators)

Whom?

- ✓ Companies offering drone/RPAS-based services (Operators).
- ✓ Companies developing drone/RPAS-based services (future Operators).
- ✓ Companies with internal drone/RPAS activities.
- ✓ RPAS pilots and professionals of this sector.

What?

- ✓ RPAS documentary development and revision
- ✓ Risk assessment for drone/RPAS activities
- ✓ Mitigation measures development

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Functional Assessment (F.A)

F.A include two key aspects to ensure a safe development of a RPAS,

- **Functional safety** analysis is a necessary process beginning in the design phase to release the system from unacceptable risks or damage to people or the environment either directly or indirectly.

- **Functional Testing** to verify the functional capabilities of the system.

① Functional Safety Management (IEC 61508)

- Identification of the product or process needs, including HW & SW, for the accomplishment of the Standard requirements
- RPAS products' safety hazards identification, considering mitigation measures
- Verification and validation
- Functional Safety Audit and Assessment

② Functional testing

Functional compliance verification, according to declared drone functionalities :

- Safe take-off and landing
- Flight modes
- Autonomy…

Why?

- ✓ Improvement of the quality of your product development phases
- ✓ Increase of your drone/RPAS' product reliability
- ✓ Overcost risks' reduction
- ✓ Harm avoidance

Whom?

- ✓ **Suppliers** and **importers**
- ✓ Product **designers** and **manufacturers**
- ✓ **Operators** and **maintainers**

All of them should avoid unacceptable risks and hazards caused by an inappropriate behaviour of the system.

What?

- ✓ Hardware Failure Modes, Effects and Diagnostic Analysis (FMEDA)
- ✓ Hardware and Software testing
- ✓ RPAS risk assessment

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Product Safety

According to the latest normative modifications in the E.U, product conformity turns into an essential concept for the RPAS market. EASA's regulatory proposal for the open category (low risk - small drones) provides some specific rules for placing these vehicles in the market through a Product Conformity process which will include the CE Marking, starting in 2018.

In this regard Alter Technology, as a quality driven provider of engineering and test services within the RPAS market, has created comprehensive services to guarantee systems and equipment reliability.

Product Conformity Assessment

The first approach is to identify the applicable directives:

- ✓ **Radio Equipment Directive (RED)** 2014/53/EU. Establishes a regulatory framework for placing radio equipment on the free market.
- ✓ **Electromagnetic Compatibility Directive (EMC)** 2014/30/EU. Guarantees that electrical and electronic equipment does not generate, or is not affected by, electromagnetic disturbance.
- ✓ **Machinery Directive (MD)** 2006/42/EC. Assurances a high level of protection for EU workers and citizens. As it is a 'New Approach' Directive, it promotes harmonization through a combination of mandatory health and safety requirements, and voluntary harmonized standards.
- ✓ **Low Voltage Directive (LVD)** 2014/35/EU. Ensures that electrical equipment within certain voltage limits provides a high level of protection.

Product Testing

- ✓ Safety testing
- ✓ Cybersecurity testing
- ✓ EMC testing
- ✓ Radio testing
- ✓ Environmental testing:
  - Mechanical: Vibration & shock, Impact
  - Climatic: temperatura & humidity (dry heat, cold, damp heat, thermal shock)
  - Salt mist test
  - Water and dust tightness test

ALTER TECHNOLOGY is ISO 17025 accredited laboratory for EMC, electrical, climatic and vibration testing (scope ENAC 345/LE808), in addition of being a Notified Body.

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