1. MITIGATION MEASURES

CODE	MITIGATION	MITIGATION MEASURE	SCOPE OF APPLICATION		OBSERVATIONS
			Operational category	CONOPS	
MAE01	Strategic	Have the necessary knowledge to obtain a radio operator rating, endorsed by a pilot licence annotation or certification issued by an approved training organisation (ATO) or ultralight aircraft school	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 33.1.e RD 1036/2017
MAE02	Strategic	Demonstrate an adequate knowledge of the language or languages used in communications between the controller and the aircraft, taking into account the operational conditions of the airspace in which the operation is conducted.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 33.1.e RD 1036/2017
MAE03	Strategic	Have adequate communications equipment capable of sustaining two-way communications with aeronautical stations and on the frequencies indicated to meet the requirements applicable to the airspace in which it operates	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 46.1.a RD 1180/2018
MAE04	Strategic	Have an alternative communication system with the ATS unit (mobile phone).	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAE05	Strategic	Have an aeronautical safety study conducted for this purpose by the operator and coordinated with the designated air traffic service provider in the airspace concerned, confirming the safety of the operation. The operation shall be conducted subject to the conditions and limitations set out in said aeronautical safety study.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 45.3.c of RD 1180/2018 In the case of open category and STS-ES shall be the “Operational Risk Assessment and Mitigation for UAS Operations in Controlled Airspace y flight information zone (FIZ)”
MAE06	Strategic	A coordination procedure has been established with the relevant airspace service provider for the airspace if all or part of the operation is conducted in controlled airspace.	- STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	UAS.SPE C.0 40.1.b In the case of STS-ES, this shall be the “Operational Risk Assessment and Mitigation for UAS Operations in Controlled Airspace and flight Information zone (FIZ)”

MAE07	Strategic	Submit a flight plan for air traffic services (FPL). The flight plan shall explicitly state that it is an unmanned aircraft.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 45.5 RD 1180/2018
MAE08	Strategic	When conducting autonomous operations, the flight plan shall explicitly state that it is an autonomous unmanned aircraft.	- Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAE09	Strategic	Coordination with the aerodrome operator, including heliports, if it is intended to operate at a distance of less than 8 km from the reference point of any airport or aerodrome and the same distance from the runway centrelines and their extension, at both runway headings, to a distance of 6 km from the runway threshold in the direction away from the runway or, for the case of operations beyond the pilot's visual range (BVLOS), where the infrastructure is equipped with instrument flight procedures, at a distance of less than 15 km from that reference point. In the case of operating within an 8 km radius of any airport, the establishment of coordination with the airport infrastructure managers, including heliports.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 45.3.b of RD 1180/2018
MAE10	Strategic	A check in the AIP of the different departure and arrival procedures for this airport according to its possible operational configurations (runway in use). Operations must be conducted by personnel who have the appropriate competencies to comply with the consultation and interpretation mitigations of FLIGHT PROCEDURES.	- Open category > 60 m - STS-ES-01 > 60 m - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances	The distance pilot training defined by EASA does not include AIP familiarisation and aeronautical chart interpretation, thus the correct implementation of this measure must be evidenced as an appendix to the Operational Risk Assessment and Mitigation
MAE11	Strategic	Operational restriction on exposure time. (use as little time as possible).	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	

MAE12	Strategic	Prior coordination, in operational risk assessment and mitigation, of ARCID code and call identifier (call sign) to be used in operations.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	It is evidenced in an appendix to the Risk Assessment and Mitigation
MAE13	Strategic	Prior coordination, in operational risk assessment and mitigation, of the language(s) to be used in aeronautical communications between the operator and the air traffic service.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Consider foreign operators coming to operate in Spain (English or Spanish language)
MAE14	Strategic	Analysis of the slots with the lowest air traffic density in the foreseen operation zone.	- Open category - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	To be assessed by the airport managing body when coordinating with this according to its procedures (e.g. EXA80 of AENA)
MAE15	Strategic	Operational restriction and definition of the operating volume reinforced by geocaging/geofencing/software, necessarily at AGL height and, whenever possible, protected from obstacles or orography.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 46.1.c RD 1180/2018 Equipment to ensure that the aircraft operates within its intended limitations, including the volume of airspace in which the flight is intended to be confined. It is evidenced in an appendix to the Operational Risk Assessment and Mitigation
MAE16	Strategic	Measurements to know the position and height of the UA (technical values to be complied with according to EASA Appendix O depending on the risk).	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 46.1.c RD 1180/2018 Equipment to ensure that the aircraft operates within its intended limitations, including the volume of airspace in which the flight is intended to be confined. Applicable to UAS without class marking

MAE17	Strategic	Provide barometric assistance to the GPS in calculating AGL altitude of the unmanned aircraft. Barometric assistance means that the UAS combines the altitude estimate resulting from the GPS signal with another measurement provided by a barometer also integrated in the system.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances above 60 m - Within aerodrome safety distances	- Consider especially in urban environments where GPS coverage may be reduced by "shielding"
MAE18	Strategic	When tethered unmanned aircraft are used, they shall only be located in areas where they do not interfere with the operations of other airspace users and their location shall always be coordinated in advance with the ATS unit concerned.	- Open category - Specific category under authorisation	- Outside aerodrome safety distances and at more than 60 m altitude	
MAE19	Strategic	Tethered unmanned aircraft operations within aerodrome safety distances shall be conducted during "off-peak" periods. On the other hand, where the location of the unmanned aircraft flight takes place on standard flight paths for manned aircraft, it shall be ensured that the operation can be suspended by landing the unmanned aircraft with sufficient margin prior to the manned aircraft overflying the area.	- Open category - Specific category under authorisation	- Within aerodrome safety distances	The airport operator would assess "off-peak periods" when coordinating with the airport operator according to its procedures (e.g. EXA80 of AENA) Mitigation assessment of flight procedures is necessary
MAE20	Strategic	When flying above 120 m around an obstacle, a maximum horizontal distance from the pilot to the obstacle shall be defined such that situational awareness is maintained.	- Open category - STS-ES-01 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAE21	Strategic	Establish additional security zones, both horizontal and vertical.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Non-mandatory, may be required by ATSP
MAE22	Strategic	Have a portable weather station for obtaining real-time measurements of the wind in the area of operations (direction and intensity)	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Non-mandatory, may be required by ATSP
MAE23	Strategic	Perform the UAS operation at the most appropriate time, determined by the ATS unit concerned.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	

MAE24	Strategic	In the case of flights in environments that are not sheltered from terrain, buildings or structures, a NOTAM shall, at the discretion of the unit, be issued if the altitude exceeds 60 m and up to 120 m.	- Open category - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances	
MAE25	Strategic	A NOTAM will be published if the altitude exceeds 120 m.	- Specific category under authorisation	- Outside aerodrome safety distances	
MAE26	Strategic	At the unit's discretion, publication of the operation in a NOTAM, ATIS, DATIS or other aeronautical media	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	
MAE27	Strategic	Have procedures in place for checking activities and warnings to airspace users (NOTAMs) in the envisaged area of operations.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances	It is evidenced in the appendix of the Operational Risk Assessment and Mitigation (Drones ENAIRE / ICARO XXI consultation)
MAE28	Strategic	Have procedures in place for checking activities and warnings to airspace users (NOTAMs) in the envisaged area of operations, as well as ATIS and DATIS consultation and interpretation. Operations must be conducted by personnel who have the appropriate competencies to comply with the consultation and interpretation mitigations of NOTAM, ATIS and DATIS.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	The distance pilot training defined by EASA does not include AIP familiarisation and aeronautical chart interpretation, thus this shall be evidenced in an appendix to the Operational Risk Assessment and Mitigation(Drones ENAIRE / ICARO XXI/ ATIS frequency consultations in AIP)
MAE29	Strategic	Have procedures in place for consultation and analysis of flight procedures linked to take-off and landing operations at the airports involved, including missed approaches and take-offs with engine failure.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	The distance pilot training defined by EASA does not include AIP familiarisation and aeronautical chart interpretation, thus this shall be evidenced in an appendix to the Operational Risk Assessment and Mitigation (AIP consultation/insignia)

MAE30	Strategic	Adequate planning of the operation to maintain situational awareness. In the event that the pilot has “no visual of the surroundings” or is flying 15 m above the highest obstacle within a 50 m radius of the UAS, the pilot shall use airspace observers and/or other means (aeronautical radio) to avoid a chance encounter with a manned aircraft.	- Open category - STS-ES-01 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Especially in urban environments where it is more difficult to observe other airspace users (subcategory Al and A2 and STS-ES-01)
MAE31	Strategic	Maximum altitude 100 m. The ATSP may require a lower maximum operating altitude for a particular operation.	- STS-ES-02	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAE32	Strategic	Maximum altitude limitation of 120 m or 15 m above the highest obstacle within a 50 m radius from the UAS. The ATSP may require a lower maximum operating altitude for a particular operation.	- Open category - STS-ES-01	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAE33	Strategic	Maximum or minimum altitude limitation according to CONOPS characteristics. The ATSP may require a maximum or minimum altitude of operation for a particular operation.	- Specific category under authorisation		Default is 120 m if CONOPS does not specify another higher or lower
MAE34	Strategic	Have lights or other devices or suitable painting to ensure visibility.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 46.1.e RD 1180/2018 Will be required for night flights
MAE35	Strategic	Have transponder or other identification system (e.g. ADS-b “out”) for air traffic services.	- STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances and at more than 120 m altitude - Within aerodrome safety distances	Non-mandatory, may be required by ATSP
MAE36	Strategic	Have Mode S transponder.	- STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 46.2 RD 1180/2018 Will be required for flights in controlled airspace. Except UAS with MTOM < 25 kg in VLOS.
MAT01	Tactics	Verification of activities and warnings for airspace users (NOTAM, etc.) in the area where UAS operations will take place. In this regard, the ENAIRE ORONES application shall, at least, be used.	- Open category - STS-ES-01	- Outside aerodrome safety distances	

MAT02	Tactics	Verification of activities and warnings for airspace users (NOTAM, etc.) in the area where UAS operations will take place. In this regard, the INSIGNIA and ICARO XXI platforms shall be used and, in particular, the latter's "BOL" Bulletins functionality, with all the information of interest regarding an aerodrome or operational zone.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances (applicable to STS-ES-02 and specific category under authorisation) - Within aerodrome safety distances.	The distance pilot training defined by EASA does not include NOTAM consultation and interpretation, thus this shall be evidenced in an appendix to the Operational Risk Assessment and Mitigation.
MAT03	Tactics	ATIS/DATIS consultation.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	The distance pilot training defined by EASA does not include AIP familiarisation and aeronautical chart interpretation, thus this shall be evidenced in an appendix to the Operational Risk Assessment and Mitigation ATIS frequency consultations in AIP) Or otherwise the specific frequency of ATIS during tactical coordination shall be indicated by the ATSP.
MAT04	Tactics	Keep active listening on the appropriate aeronautical frequency or, failing that, be able to communicate by mobile telephony system (adequate sound volume and with coverage).	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAT05	Tactics	Contact the HTM unit with the advance notice indicated by the ATSP according to the coordination procedure to verify the feasibility of the operation.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAT06	Tactics	Have prior air traffic control clearance or communication to aerodrome flight information staff (AFIS). On first contact with air traffic service units, the call signs of unmanned aircraft shall include the word "Unmanned".	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Article 45.3.c RD 1180/2018
MAT07	Tactics	When conducting autonomous operations, on first contact with air traffic service units, the call signs of unmanned aircraft shall include the word "Unmanned autonomous".	- Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	

MAT08	Tactics	Communicate the completion of the operation to the air traffic services unit (ATS).	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAT09	Tactics	Availability and implementation by the UAS operator of specific procedures for abnormal and emergency situations, with the main measure being radio/telephone notification to the ATS unit in the event of loss of control of the UAS (fly-away).	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAT10	Tactics	Prior analysis of VHF coverage in the planned area of operations, as well as telephone network coverage in the event of using this medium either as the primary communications system or as an alternative if the primary medium fails. Prior to commencing the operation, it must be possible to perform a radio and/or call test, the suitability of which shall be at the discretion of the ATS unit.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAT11	Tactics	For tethered unmanned aircraft, where the location of the unmanned aircraft flight takes place on standard flight paths for manned aircraft, it shall be ensured that the operation can be suspended by landing the unmanned aircraft with sufficient margin prior to the manned aircraft overflying the area.	- Open category - STS-ES-01 - Specific category under authorisation	- Outside aerodrome safety distances above 60 m - Within aerodrome safety distances	The operator shall indicate in the UAS technical characteristics the pick-up times of the tethered unmanned aircraft.
MAT12	Tactics	Request collision avoidance advice or traffic information in respect of manned aircraft in the vicinity.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	
MAT13	Tactics	Request collision avoidance advice or traffic information in respect of manned aircraft in the vicinity.	- Specific category under authorisation	- Outside aerodrome safety distances and at more than 120 m altitude	
MAT14	Tactics	Verify the correct functioning of the geopositioning systems and signal quality, and correct set-up of geocaging/geofencing.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	

MAT15	Tactics	Verify the correct functioning of the geopositioning systems and signal quality, and correct set-up of geocaging/geofencing.	- Specific category under authorisation	- Outside aerodrome safety distances and at more than 120 m altitude	
MAT16	Tactics	Checking the planetary K-index is less than 4.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	
MAT17	Tactics	Checking the planetary K-index is less than 4.	- Specific category under authorisation	- Outside aerodrome safety distances and at more than 120 m altitude	
MAT18	Tactics	Have procedures in place for improving situational awareness of the environment, by dedicated airspace observer or georeferenced equipment/software (e.g. ADS-B “IN”).	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Within aerodrome safety distances	
MAT19	Tactics	Have procedures in place for improving situational awareness of the environment, by dedicated airspace observer or georeferenced equipment/software (e.g. ADS-B “IN”).	- Specific category under authorisation	- Outside aerodrome safety distances and at more than 120 m altitude	
MAT20	Tactics	Immediate landing by communication from the ATC service or traffic information from AFIS.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAT21	Tactics	When using a tethered unmanned aircraft, care shall be taken to ensure that the cable y the tethering system do not fail. In the event of a breach of the containment system, action shall be taken in accordance with its abnormal procedures y emergency procedures, which shall include as a primary measure landing the aircraft and radio/telephone notification to the ATS unit.	- Open category - STS-ES-01 - STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	
MAT22	Tactics	Verification of the availability, continuity, reliability and integrity of pilot-to-observers communications.	- STS-ES-02 - Specific category under authorisation	- Outside aerodrome safety distances - Within aerodrome safety distances	Also in cases where observers are required as a mitigation measure