MSI IR Regulatory Compliance Matrix

# Introduction

The following table provides guidance to the ANSPs regarding how compliance with the IR can be claimed and demonstrated. The table only contains the provisions of the IR that are relevant to the Mode S operators/ ANSPs. Please note that the example responses stated in this table are for guidance only and should not be presumed as the only response possible to demonstrate compliance with the IR.

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| ARTICLE | ANSP RESPONSIBILITIES AND GUIDANCE MATERIAL | ANSP RESPONSE |
| 3 Interoperability and performance requirements |  |  |
| Mode S operators shall ensure that the radar head electronics constituent of their Mode S interrogators using an operational interrogator code:  3(1) support the use of SI codes and II codes in compliance with the International Civil Aviation Organisation provisions specified in Annex I point 1. | The relevant ICAO provisions are extracted In Annex 2 for ANSP reference.  Depending on the type of interrogator code used by the ANSP interrogator (II or SI) the relevant requirements in ICAO Annex 10 Chapter 3 section 3.1.2.5.2.1.2 must be complied with. | ANSP Example response:  The {airport} surveillance sensor (SSR) operates on a single II/SI code issued by the MICA cell. The II/SI code is used in accordance with requirements in ICAO Annex 10 Chapter 3 section 3.1.2.5.2.1.2. |
| 3(2) support the use of II/SI code operation in compliance with the requirements specified in Annex III. | Where the Mode S interrogator uses an II code the relevant requirements in ANNEX 3 of the IR must be satisfied.  Where the Mode S interrogator operates with an SI code the relevant requirements for an SI code in ANNEX 3 of the IR must be complied with. | ANSP Example response:  The {airport} surveillance sensor (Mode S SSR) uses an SI code issued by MICA and support the functionality stated in Annex 3 for the Interrogators operating with an SI code. This has been assessed during Site Acceptance Test Report {reference}. |
| 4 Associated procedures for Mode S operators |  |  |
| 4(1) Mode S operators shall only operate an eligible Mode S interrogator, using an eligible interrogator code allocation, for this purpose, from the competent Member State. | In order to operate a Mode S radar in the UK ANSPs must have applied for and obtained;  An approval to operate a Mode S interrogator in the UK from the NISC (NISC Interrogator Certificate)  Obtain an IC allocation and lock-out coverage map from the MICA Cell (MICA Interrogator Code Certificate)  ANO Approval from the SARG  Aeronautical Radio Licence issued under the Wireless Telegraphy Act 2006  The process for applying for a NISC Interrogator Certificate can be found in CAP 761.  DAP Form 1910 must be used for application to operate a Mode S Interrogator in the UK.  ANSPs must use the MICA Web portal for the application and obtaining of MICA Interrogator Code Certificate and relevant lockout coverage map files. The application for obtaining an IC is available on the MICA web site (Mode S IC Application Form).  ANSPs should follow the EUROCONTROL Specification for the Mode S IC Allocation Coordination and IC Conflict Management. (Eurocontrol Spec -153)  <http://www.eurocontrol.int/sites/default/files/content/documents/single-sky/specifications/20130614-mica-spec-v1.0.pdf>  The application for obtaining a WTA Act Licence should be made through https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/aeronautical-licensing | ANSP Example response:  {airport} operates an eligible Mode S interrogator for which approval was granted by the NISC. See the NISC Interrogator Certificate attached.  Mode S IC allocation issued by the MICA Cell has been correctly implemented in the interrogator.  {airport} has implemented the assigned interrogator code and lockout map, and fully in accordance with the operating conditions attached to the NISC Interrogator Certificate and the MICA Interrogator Code Certificate No {xxxx}.  The interrogator code and lockout map configuration is defined in the Software Configuration File ref {xxxx}. |
| 4(2) Mode S operators intending to operate, or operating, an eligible Mode S interrogator for which no interrogator code allocation has been provided, shall submit an interrogator code application to the competent Member State in accordance with the requirements specified in Annex II, Part A | The co-ordination process between the ANSP, UK MICA State Focal Point and MICA Cell for IC allocation is described in Section 4 of the above guidance document.  ANSPs must register themselves on the MICA Cell and use the Mode S IC Application on the MICA portal, fill the form correctly and completely. The application will then be sanctioned by the UK State Focal Point (CAA) and be passed on to MICA for issuing an interrogator code. | ANSP Example response:  {airport} has obtained the NISC approval to operate the Mode S interrogator {NISC Interrogator Certificate No. xxx}.  Application to obtain an IC was submitted via the MICA Cell portal. The requirements in Annex II Part A were complied with and all items as required in Annex II were submitted as part of the application. |
| 4(3) Mode S operators shall comply with the key items of the interrogator code allocations they receive as listed in Annex II, Part B. | Evidence must be available that the radar has been configured in compliance with the conditions and settings specified on the MICA Interrogator Code Certificate.  Evidence must be available for each item (from (a) to (i) listed in Annex II Part B. | ANSP Example response:  All provisions listed in the MICA Code Allocation files were correctly implemented in the {airport} Mode S Interrogator.  Surveillance and Lockout coverage restrictions applied as per the code certificate.  The correct and current IC implemented as per the current interrogator code allocation.  Implementation sequence followed as specified by MICA Cell.  All operational restrictions in the interrogator code allocation have been correctly implemented in the system. |
| 4(4) Mode S operators shall inform the competent Member State at least every six months of any change in the installation planning or in the operational status of the eligible Mode S interrogators regarding any of the interrogator code allocation key items listed in Annex II, Part B | Six-monthly reporting is not necessary providing that no change has been made to the operational status of Mode S interrogators.  Changes regarding any elements specified in Annex II Part B, stated in the MICA Code Allocation must be informed to the MICA State Focal Point.  Internal procedures must be in place to communicate the changes to the state focal point in an effective manner.  Any changes with regard to elements stated in the NISC certificate must be reported In accordance with CAP 761:  If a change to the technical or operational details of an interrogator is required, applicants are to reapply to NISC in accordance with CAP 761.  Should the requirement for an interrogator, for which an approval has already been granted, cease to exist then the NISC Secretariat and the MICA State Focal Point must be informed by the operator. | ANSP Example response:  Any changes affecting the items of the IC allocation listed in Annex II Part B will be communicated to the MICA UK State Focal Point.  Airport operational procedure {xxx} section {xxx} specifies the process.  Any planned change in the operational status of the Mode S interrogator will be reported to the National IFF/SSR Committee in accordance with the national procedures laid down in CAP761 and the associated {airport} process {reference} |
| 4(5) Mode S operators shall ensure that each of their Mode S interrogators uses exclusively its allocated interrogator code. | The Interrogator, at any given time, must only be operating with the allocated interrogator code as specified in the current MICA Code Certificate.  Procedures must be in place to allocate the current interrogator code including when the code allocation is changed, effectively in accordance with the implementation sequence. | ANSP Example response:  The {airport} procedure {xxx} for deploying interrogator codes details checks to be made and recorded on site to ensure that the interrogator codes and lockout map have been correctly implemented and are in line with the IC allocation. |
| 6 Associated procedures for air traffic service providers |  |  |
| Air traffic service providers shall not use data from Mode S interrogators operating under the responsibility of a third country if the interrogator code allocation has not been co-ordinated. | Where an ANSP intends to use surveillance data from a country other than from within their state, the ANSPs must only use Mode S data from interrogators where the Code Allocations have been co-ordinated as per the MICA Code Allocation process and state co-ordination process.  Where there is a requirement to use surveillance data from a 3rd country, the ANSPs should contact the MICA UK state focal point to ensure such sensors operate on MICA allocated IC codes. | ANSP Example response:  N/A – At the present time {airport} does not make use of any radar data from third countries which are Mode S capable. |
| 7 Contingency requirements | In addition to the guidance provided in this table, the requirements in CAP 670 SUR 05 must be complied with. |  |
| 7(1) Air Traffic Service Providers shall assess the possible impact on air traffic services of interrogator code conflicts, and the corresponding potential loss of Mode S target surveillance data from the impacted Mode S interrogators, taking into account their operational requirements and available redundancy. | The risk assessment should take into account the items identified in section 9 of the ANSP guidance material published in the CAA interoperability web site.  ANSPs must assess this risk and where considered safety significant, provide mitigation(s) (for example changing the configuration to an alternative and approved configuration or making use of alternative surveillance systems). | ANSP Example response:  A hazard identification and risk assessment has been conducted by the {airport} to assess the impact of potential interrogator code conflict situation at the airport. This is recorded in {airport} safety case (reference/section}. |
| 7(2) Unless the potential loss of Mode S target surveillance data has been assessed to have no safety significance, Mode S operators shall:  Implement monitoring means to detect interrogator code conflicts caused by other Mode S interrogators impacting eligible Mode S interrogators they operate on any operational interrogator code. | Information presentation on the display HMI may consider potential benefits of highlighting overlapping regions. | ANSP Example response:  The {xxx} airport will monitor interrogator code conflicts by manual detection.  The {airport} ATE department will be alerted to any potential interrogator code conflicts following a suspected or detected code conflict.  Controllers have been made fully aware of manual detection of interrogator code conflict situations and possible impact on the display.  The {airport} PSR has coverage over the Mode S overlap area, hence any persistent loss of Mode S replies will be seen as a primary target.  This does not impact separation services at the {xxxxx} airport or other services since no Mode S specific data items are used at present for any surveillance applications.  Interrogator Code Conflict procedure is documented in {reference procedure for monitoring, addressing and resolving interrogator code conflicts} |
| 7(2) (b) ensure that the interrogator code conflict detection provided by the implemented monitoring means is achieved in a timely manner and within a coverage that satisfy their safety requirements; | Where a PSR or any additional surveillance layer (a second SSR feed, MLAT data or ADS-B data) is not available loss of Mode S targets may not be manually detectable.  Having additional secondary surveillance layer that provides Mode S data items may also mask the interrogator code conflict between the interrogators in question. Unless surveillance data items specifically obtained by the interrogator were missing from the ATC display the loss of Mode S data hence interrogator code conflict may be hidden, However this ensure Mode S targets are detected(position information is known) and hence may provide adequate mitigation. | ANSP Example response:  The hazard identification and risk assessment documented in Safety Case {xxxxx} section {reference}.  The airport does not operate in SSR only mode, but in combined mode with PSR or in PSR only mode. Hence no automatic interrogator code conflict detection mechanism is implemented since PSR provides sufficient level of mitigation for potential loss of Mode S targets arising from an interrogator code conflict whenever service is provided. |
| 7(2) (c) identify and implement as appropriate, a fallback mode of operation to mitigate the possible interrogator code conflict hazards on any operational code, identified in the assessment referred to in paragraph 1; | Where the risk of potential interrogator code conflicts are mitigated by having an additional surveillance layer (such as PSR/WAM), the ANSP may consider the operation with other surveillance systems as the fall back mode of operation. | ANSP Example response:  In the event of possible interrogator code conflict {airport} ATC will use procedures described in: {MATS Part 2 reference} |
| 7(2) (d) ensure that the implemented fallback mode of operation does not create any interrogator code conflict with other Mode S interrogators referred to by the interrogator code allocation plan. | Typical fallback modes of operation are unlikely to use different interrogator codes (unless an alternate Mode S interrogator is used as fall back mode) and therefore interrogator code conflicts in fallback modes would not be expected. | ANSP Example response:  Approved fallback modes of operation do not rely on IC allocations and therefore interrogator code conflicts are not expected. |
| 7(3) Mode S operators shall report any identified interrogator conflict involving an eligible Mode S interrogator they operate on any operational interrogator code to the competent Member State and shall make available, through the IC allocation system, the related information to the other Mode S operators. | ANSPs must report any conflicts to the National IFF/SSR Committee and to the UK MICA state focal point.  The conflict reporting procedure is included in the EUROCONTROL Specification for the Mode S IC Allocation Coordination and IC Conflict Management.  Any interrogator code conflicts must be reported to the NISC using DAP form 1913. In addition the ANSPs must also report the code conflict situation on the reporting mechanism available on the MICA web tool.  The ANSP should also endeavour to inform the CAA Regional Inspectorate of the situation.  ANSP must ensure that ANSP contact details are provided and kept up to date on the MICA web site and with the UK state focal point for the purposes of reporting and coordinating code conflicts. | ANSP Example response:  In accordance with CAP761, interrogator conflict situations will be reported to the National IFF/SSR Committee using a DAP 1913 form and will also be reported via the MICA Online Tool. |
| 9 Safety requirements |  |  |
| 9(1) Mode S operators shall ensure that potential interrogator code conflict hazards affecting their Mode S interrogators are properly assessed and mitigated. | ANSPs are to ensure proper assessment of potential interrogator code conflicts and take appropriate mitigations.  ANSPs must assess and mitigate the risk of code conflicts. | ANSP Example response:  Refer to 7(1) |
| 9(2) 2. Member States shall take the necessary measures to ensure that any changes to the existing systems and associated procedures referred to in Article 1(2) or the introduction of such new systems and procedures are preceded by a safety assessment, including hazard identification, risk assessment and mitigation, conducted by the parties concerned. | ANSPs are to ensure a safety assessment, including hazard identification, risk assessment and mitigation is performed preceding any changes to existing systems or procedures  ANSPs must conduct a safety assessment including hazard identification, risk assessment and mitigation before implementing any changes to systems and procedures.  Such changes may include implementing a fall back mode of operation, additional procedures, or system changes such as implementation of a code conflict detector. | ANSP Example response:  {airport} has carried out a safety, risk and hazard assessment addressing the change to the {airport} SSR/related procedures. This is reported in {airport} safety case {section/reference} |
| 11 Verification of systems |  |  |
| 11(1) Air Navigation Service Providers which can demonstrate or have demonstrated that they fulfil the conditions set out in Annex V shall conduct a verification of the systems referred to in Article 1(2) in compliance with the requirements set out in Annex VI Part A | ANSPs must ensure that test activities including Factory Acceptance Testing, Site Acceptance Testing and Flight Checks demonstrate compliance with Annex VI Part A and that these tests have been witnessed and signed off by an ANSP representative who is independent and impartial.  Where no notified body is used for this purpose, the ANSP must provide evidence that they meet requirements set in Annex V of this regulation. | ANSP Example response:  The {airport} procedures for system verification ensure that the assessments performed by {airport} are independent and impartial in accordance with Annex V.  {airport} has the following procedures in place which demonstrate the conformity of these systems with the interoperability, performance, contingency and safety requirements of this Regulation in an assessment environment that reflects the operational context of these systems {detail procedures and tests carried out}. |
| 12 Additional requirements |  |  |
| 12(1) Mode S operators shall ensure that their personnel in charge of the implementation of interrogator code allocations are made duly aware of the relevant provisions in this Regulation and that they are adequately trained for their job functions. | ANSPs are to ensure their personnel involved in interrogator code implementation are adequately trained and duly aware of the regulation.  ANSP must ensure that the personnel that implement code allocations are competent for the task and necessary training provided.  Where the ANSP relies on manufacturers or a third party to implement code changes or adjust system configurations as necessary, evidence shall demonstrate that this does not result in an increased risk in a code conflict situation. | ANSP Example response:  Personnel involved with the implementation of IC allocations have been made aware of the Regulation and have received training through a variety of technical courses. Additionally those responsible for onsite implementation are assessed by the {airport} engineering manager for competency. |
| 12(2) Mode S operators shall:  a) develop and maintain Mode S operations manuals, including the necessary instructions and information to enable their personnel in charge of the implementation of interrogator code allocations to apply the provisions of this Regulation; | ANSP must develop and maintain operations manuals (including manufacturers’ technical manuals) and procedures with regard to implementation of interrogator codes, to ensure that Interrogators can be configured in accordance with the conditions specified on the MICA Code Certificate and NISC approval. | ANSP Example response:  {airport} maintains Mode S operation and maintenance manuals and information to enable the personnel in charge of the implementation of interrogator code allocations to apply the provisions of this Regulation. |
| (b) ensure that the manuals referred to in point (a) are accessible and kept up-to-date and that their update and distribution are subject to appropriate quality and documentation configuration management; | ANSPs must ensure that the manuals and procedures are accessible and up to date and subject to appropriate quality and document control. Established methods should already be in place as required in Annex 1 3.2 and 3.3 of the Common Requirements Regulation  ANSPs must ensure that the operations and maintenance manuals are adequately controlled and distributed. | ANSP Example response:  {airport} Mode S operation and maintenance manuals are controlled under the {airport} quality system and available to the authorised {airport} operators and maintenance personnel.  The maintenance procedure is subject to configuration control and is readily accessible when required. |
| (c) ensure that the working methods and operating procedures required for the implementation of interrogator code allocations comply with the relevant provisions specified in this Regulation. | ANSPs must ensure that working methods and procedures comply with the regulation. | ANSP Example response:  The {airport} working methods and operating procedures required for the implementation of interrogator code allocations are controlled under the {airport} quality system and comply with the relevant provisions specified in this Regulation |