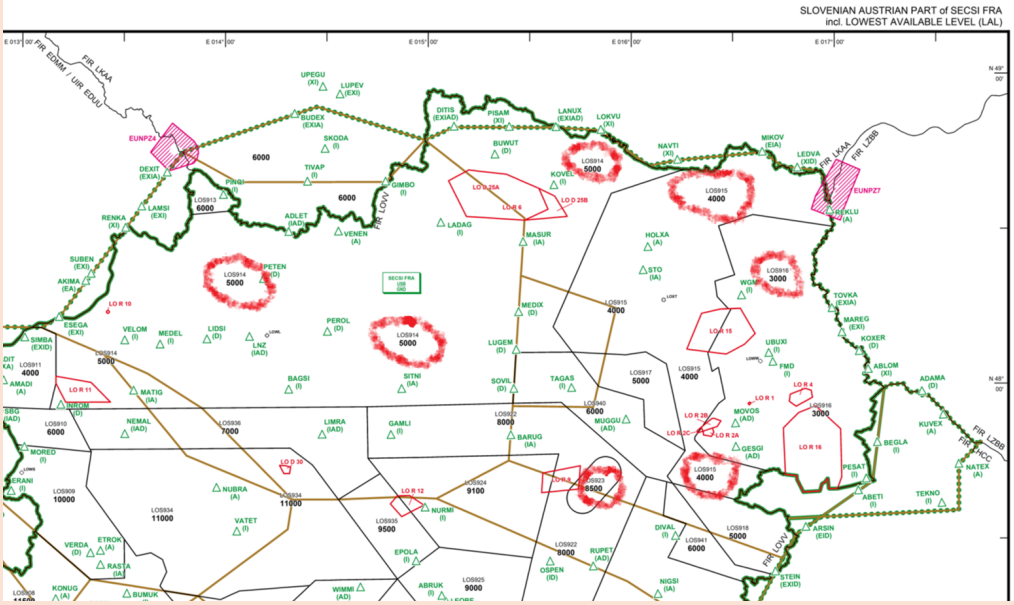


Q&A Session Summary for FRA Implementation Webinar (15-16 September 2025)

| No. | Date & Time | Questions |
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| 1. | Sep 15 2025 12:20 PM | What are the key differences between Direct Route (DRT), User Preferred Routes (UPR), and Free Route Airspace? |
| | | <ul style="list-style-type: none"> • DRT (Direct Routing): Aircraft fly on fixed direct segments, usually between predefined points. Routes are shorter than traditional ATS routes but not fully free. • UPR (User Preferred Routes): Airlines propose preferred routes tailored to winds, fuel savings, or time, requiring ANSP approval. • FRA (Free Route Airspace): Aircraft can freely plan routes between published entry and exit points, without using predefined ATS routes. |
| 2. | Sep 15 2025 12:21 PM | What technologies are needed for FRA implementation? |
| | | <ul style="list-style-type: none"> • I think successful FRA implementation demands modern ATM and CNS capabilities, including: <ul style="list-style-type: none"> ✓ Advanced Flight Data Processing Systems (FDPS) to handle flexible, user-defined routes. ✓ Seamless Surveillance (radar + ADS-B + MLAT) for real-time trajectory tracking. ✓ Automated Conflict Detection Tools to assist ATCOs in monitoring customized routes. ✓ Cross-border ATFM/Flow Tools to manage varying route demands. ✓ AIP updates and digital publication (e.g., AIXM-based systems) for transparent user access. • That's about the extent of what I can think of. |
| 3. | Sep 15 2025 12:21 PM | What are the key ICAO frameworks and regulatory references supporting FRA implementation? |
| | | <ul style="list-style-type: none"> • FRA is aligned with global ICAO strategies and documents: <ul style="list-style-type: none"> ✓ Global Air Navigation Plan (GANP): FRA aligns with the Trajectory-Based Operations pillar, targeting improved predictability and environmental outcomes. ✓ ASBU Framework (Block 1 – FRTO Module): Endorses FRA to enhance flexibility and user-driven operations. ✓ ICAO Doc 9750 & Doc 9971: Provide implementation guidance for PBN and FRA, outlining procedural and technical enablers. ✓ AIP Publication Standards: For Direct Routing segments (SDR), ENR 1.9 / 1.10 / 3.3: For contingency and FRA-specific procedures. |
| 4. | Sep 15 2025 12:35 PM | Does not FRA preceded by CDR (mostly for direct routing purpose)? |
| | | <ul style="list-style-type: none"> • Not directly as CDRs were part of FUA management but as “direct” optimum connections for AOs might indirectly be considered as preceding FRA. FRA is also preceded by strategic DRT (Direct Routing) available for flight planning. |
| 5. | Sep 15 2025 12:35 PM | What do you mean by between defined entry and exit point? Is the entry point/exit point an entry/exit point of an ATS route or a defined entry based on coord provided from the fpl? Please elaborate |
| | | <ul style="list-style-type: none"> • Defined entry and exit point mean all existing established points on FRA area boundaries. In initial FRA design and implementation, the boundary entry or exit point is this point established on ATS route when entering/existing relevant airspace. If FRA is “local” inside a particular State airspace it is stated that entry and exit point is a published significant point, it cannot be a LAT/LONG. If FRA is cross-border between two States, for example the common boundary points are intermediate, and common boundary can be crossed at any location. Significant point defined by |

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| | | LAT/LONG or BRG/DIST can ONLY be a FRA Intermediate. All is explained in EUROCONTROL FRA Concept in ERNIP Part 1, Chapter 10. https://www.eurocontrol.int/concept/free-route-airspace |
| 6. | Sep 15 2025 12:36 PM | How FRA is implemented in procedural airspace |
| | | <ul style="list-style-type: none"> No experience as no such airspace in Europe. North Atlantic Airspace is NO FRA except Bodo Oceanic area for which Norway can be contacted. FRA Concept did not cover such aspects. |
| 7. | Sep 15 2025 12:36 PM | How Flight Level Orientation Scheme (FLOS) is affected and how its harmonization or prediction can be ensured for safety and separation standards? |
| | | <ul style="list-style-type: none"> It is a long explanatory issue as FLOS in FRA is very important and cannot be explained in a sentence. For FLOS aspects see EUROCONTROL FRA Concept in ERNIP Part 1, Chapter 10. https://www.eurocontrol.int/concept/free-route-airspace. If there are unclear issues EUROCONTROL will be pleased to clarify all. |
| 8. | Sep 15 2025 12:37 PM | Are there any specific technological requirements in respect of "Advanced ATM systems" for FRA implementation? |
| | | <ul style="list-style-type: none"> Being technologically developed for Europe there are some additional requirements which are in EUROPEAN COMMISSION IMPLEMENTING REGULATION (EU) 2021/116 on the establishment of the Common Project One supporting the implementation of the European Air Traffic Management Master Plan which can be downloaded from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0116 |
| 9. | Sep 15 2025 12:38 PM | If the airspace is surveillance capable, example with space based ADS-B for remote airspace. How will this help the implementation of FRA. |
| | | <ul style="list-style-type: none"> No such airspace in European FRA as it is fully radar service environmental. |
| 10. | Sep 15 2025 12:38 PM | If FRA being implemented will the controller know the direction of the aircraft flying whether it's going to be a conflict with another aircraft? |
| | | <ul style="list-style-type: none"> YES in a radar environment if the ATM system includes relevant supporting tools. See for Europe above that one of the most important tools is the Medium-Term Conflict Detection (MTCD). With this tool YES ATC knows all traffic patterns and conflicts. In procedural airspace the only source are the FPLs and ... strips. |
| 11. | Sep 15 2025 12:38 PM | If an aircraft using FRA only has to enter and exit at designated points and does not require traditional ATS routes, why is it called free route and not non route? |
| | | <ul style="list-style-type: none"> An aircraft using FRA only has to enter and exit at designated points ONLY when the FRA is local, if FRA is cross-border no such requirement for common boundary points between the FRA States. The airspace is named Free Route which is defined as a specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) significant points, without reference to the ATS route network, subject to airspace availability. Depending on vision it could be named "Non route airspace" but this name is not chosen 16 years ago and became popular as Free Route Airspace. |
| 12. | Sep 15 2025 12:40 PM | Is there any difference between FUA and FRA? |
| | | <ul style="list-style-type: none"> FUA is part of the FRA. FUA is how the airspace is managed depending on its use which has an impact on FRA available option. These are two different concepts, but FUA supports FRA. FUA is established a few decades ago and not directly related to FRA, it supports the FRA. For more details, please refer to the presentation of ICAO. |

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| 13. | Sep 15 2025 12:42 PM | Is FUA (Flexible Use of Airspace) implemented in your State? (To all member states participated) |
| | | <ul style="list-style-type: none"> Lots of States in the APAC Region have implemented FUA. |
| 14. | Sep 15 2025 12:53 PM | What is the meaning of cross-border area ? |
| | | <ul style="list-style-type: none"> If related to FRA it is: Cross-border FRA is a specified free route airspace that comprises part and/or the whole areas of responsibility of at least two adjacent ATC units (e.g. ACCs, UACs, etc.) or FRA areas where common procedures are applied regardless of national and/or operational boundaries. If related to FUA it is: Cross-Border Area (CBA) is an airspace restriction or reservation established over international borders for specific operational requirements. This may take the form of a Temporary Segregated Area or Temporary Reserved Area. Cross-border area (CBA). An airspace reservation or segregation established for specific operational requirements over international boundaries. (Doc 10088) |
| 15. | Sep 15 2025 12:56 PM | Does FRA helps in oceanic airspace where parallel routes already exist. |
| | | <ul style="list-style-type: none"> FRA is not referred to and implemented in North Atlantic Airspace where the highest level of traffic is. It is implemented in Bodo Oceanic Airspace (Norway) where traffic is very low. It depends. Relevant authorities need to carry out benefit-cost analysis before launching FRA operation in any airspace. |
| 16. | Sep 15 2025 1:01 PM | What information should be published on FRA chart benchmarking MEA(Minimum Enroute Altitude) in the conventional enroute charting? |
| | | <ul style="list-style-type: none"> In accordance with ICAO Annex 4 there is no such chart named as “conventional”. There is En-route Chart from which FRA is part of. In Europe in few States FRA is implemented down to so called “Lowest Available Level” which is properly indicated at FRA en-route chart. See example |

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| | |  <ul style="list-style-type: none"> • Already answered at the Webinar |
| 17. | Sep 15 2025 1:05 PM | Will the materials be shared with the participants? |
| | | <ul style="list-style-type: none"> • Our PPTs YES. • Sure, all relevant materials will be uploaded to the ICAO APAC meeting website. |
| 18. | Sep 15 2025 1:06 PM | Is there a specified traffic limit that allows execution of FRA. Or for a another word, over that traffic volume FRA will affect airspace efficiency. |
| | | <ul style="list-style-type: none"> • NO • Personally, I think it is hard to define such kind of traffic limit due to the complex of airspace environment with various considerations such as CNS capability, fleet capability, air traffic volume/distribution, hotspots etc. |
| 19. | Sep 15 2025 1:07 PM | For TRA, before how much time the airspace needs to be reserved? |
| | | <ul style="list-style-type: none"> • FUA is fully automated, and processing and reservation is in accordance with airspace management handbook. https://www.eurocontrol.int/publication/european-route-network-improvement-plan-ernip-part-3 (Normally reservations are the day before ...) • It depends on various factors including the activity that is going to happen in the TRA, surrounding civil traffic volume / complexity etc., and will be the decision of each States with the intention to ensure safety for both civil and military. |

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| 20. | Sep 15 2025 1:07 PM | In which type of airspace structure does Special Use Airspace (SUA) falls, Conventional or FUA? |
| | | <ul style="list-style-type: none"> In general, it seems SUA is not an ICAO term but being used is a term summarizing deferent existing airspace structures such as D, R, P areas, all FUA areas, etc. In Europe Special Areas is used which is defined as “Airspace Limitation is a generic term used to harmonise the terms expressions in the FRA Concept, referenced to the airspace reservations, airspace restrictions and flight plan capturing volumes.” What airspace reservations, airspace restrictions and flight plan capturing volumes mean is further defined in ERNIP Part 1 (see link below in 32). Special use airspace (SUA). In the context of ICAO 10088, SUA is a generic term used for airspace volumes designated for specific operations, such as military training, exercises and operations, of a nature such that required limitations on airspace access may be imposed on other aircraft not participating in those activities. These may include, but are not limited to, restricted, danger and prohibited areas or temporary reserved areas (TRA). However, each States may have its own definition of SUA. |
| 21. | Sep 15 2025 1:10 PM | What if the aircraft’s navigation capability does not support RNAV operation? (i.e. ‘Conventional Only’ due to MEL restrictions) |
| | | <ul style="list-style-type: none"> Irrelevant for Europe as in en-route airspace ONLY RNAV 5 equipped aircraft is allowed. Exemptions are ONLY for State aircraft or MIL if not mistaken. One possible solution is to revert to the fixed route network and/or ATC vectoring at tactical level. |
| 22. | Sep 15 2025 1:26 PM | How do controllers apply separation? Is it through VHF or other means. |
| | | <ul style="list-style-type: none"> Irrelevant for Europe with fully radar and VHF services. In New Zealand Oceanic airspace we issue clearances through CPDLC or HF relay through Auckland Radio. In Ujung Pandang FIR-Indonesia, controllers primarily provide separation using surveillance data and instructions delivered via VHF frequencies. When VHF coverage is limited, we back it up with CPDLC and HF (Ujung Radio) for clearances and position reports. These communication channels support the application of standard radar or procedural separation minima. |
| 23. | Sep 15 2025 1:37 PM | For ms marnie - What kind of separation do you use in the oceanic airspace? procedural or surveillance? Are you using space based adsb or PBCS separation? |
| | | <ul style="list-style-type: none"> We are a procedural airspace of 30 million square nautical miles. We use PBCS RCP/RSP when aircraft are suitably equipped ie Datalink RNP4 or better otherwise RNP10 separations 50nm (100nm non RNP) 10mins Mach # or 10nm RNP10 (15mins Non RNP10), 1000ft vertically (2000ft Neg RVSM) |
| 24. | Sep 15 2025 1:51 PM | @Marnie....In the QFA12 example, how do you ensure lateral separation with traffic on ATS Route? If UPR is separated from OTS why can't an ATS route be established. |

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| | | <ul style="list-style-type: none"> A great question. When the Oceanic Control System became operational in 2001, I can only assume that UPR was used as it was possibly the closest definition or acronym available in ICAO at that time. Now that it has been defined as a step toward FRA and requiring ANSP approval we probably operate more towards FRA. We don't require ANSP approval prior to operating a UPR. The slides show explains how the Oceanic Control system (OCS) works and the fundamental function being the conflict prob and reporting system (CPAR), a sophisticated long range conflict alert. The way the system works, creates and manages aircraft profiles, enables us to separate each aircraft against all traffic in and in the vicinity of the FIR rendering published ATS unnecessary. |
| 25. | Sep 15 2025 1:52 PM | Umi, would you consider the FPCS(or similar tools) to be a pre-requisite for UPR/FRA, or can controllers adapt to the dynamic trajectory monitoring without these supporting tools? |
| | | <ul style="list-style-type: none"> Controllers can adapt to dynamic trajectory monitoring without FPCS, but it takes more time to assess potential conflicts, which may involve several aircraft due to the flexible routes. With FPCS, identifying and resolving those conflicts becomes much faster and more precise. The tool greatly enhances efficiency and safety in UPR/FRA operations. |
| 26. | Sep 15 2025 1:54 PM | To all member states participated, are there any ideas for joint simulation, training, or validation campaigns? |
| | | - |
| 27. | Sep 15 2025 1:58 PM | What is the airspace designation ? |
| | | <ul style="list-style-type: none"> In accordance with ICAO Doc 10066 PANS-AIM, Appendix 1 Aeronautical Data Catalogue, Table A1-2 Airspace data the term “designation” refers to ATS airspace (FIR/UIR, CTA, TMA, CTR) and means “The designator given to an airspace by a responsible authority”. For other airspace the term is “identification” meaning almost the same “The identification assigned to uniquely identify the airspace”. Airspace designation/identification is very important in data provision and system coding where each airspace shall have its ID. The ONLY requirement by ICAO is in Annex 11, para 2.33 defining the identification and delineation of prohibited, restricted and danger areas. Due to such lack of harmonised and standardised identification rules EUROCONTROL developed them and currently the Guidelines for airspace designation/identification is included in ERNIP Part 1, Chapter 9 (see link below in 32). Auckland Oceanic is class A above F245 and class G F245 and below. Airspace under AirNav Indonesia is designated Class A through G, with Class A for upper airspace (starting from FL245 in most FIRs), C/D for TMAs and control zones, and E/F/G for advisory or uncontrolled areas. |
| 28. | Sep 15 2025 2:16 PM | how much FRA is feasible for a country that does not have geographical length? |
| | | <ul style="list-style-type: none"> Answered - it is feasible this was proven in European airspace implementation. |
| 29. | Sep 15 2025 2:17 PM | What unit is appropriate to handle the network manager function. ATFM?AIS? |
| | | <ul style="list-style-type: none"> Irrelevant for Europe but ... ATFM is more logic. AIS has limited specific functions. |

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| 30. | Sep 15 2025 2:17 PM | Is sector capacity considered.if yes how is the sectorisation planned |
| | | <ul style="list-style-type: none"> YES always in all FRA steps. Gradual FRA implementation (for example first Night, next extended ..etc.) provides a reasonable source to consider sectorization and its possible future changes in FRA H24 environment. Some restrictions are also possible to keep traffic on desired profiles - laterally and vertically. |
| 31. | Sep 15 2025 2:26 PM | Should a basic route network remain for contingency arrangements? |
| | | <ul style="list-style-type: none"> It is a State decision. FRA Concept states under Publication of a Contingency ATS Route Network (1) There is no over-arching requirement for a European contingency fixed ATS route network. |
| 32. | Sep 15 2025 2:34 PM | What are the reference documents and materials to learn details about FRA and related knowledge ? |
| | | <ul style="list-style-type: none"> All is here https://www.eurocontrol.int/concept/free-route-airspace especially ERNIP Part 1 see Chapter 9 and Chapter 10. |
| 33. | Sep 15 2025 2:47 PM | Based on the last presentation, IATA proposing both new ATS routes and FRA implementation seems to be counterproductive. Why do this? The last presentation said ATS routes are not needed for FRA |
| | | <ul style="list-style-type: none"> Answered - it is feasible as in ATS route environment not all options are available due to rigidity of ATS route network allowing only limited routes. Thanks for the question. IATA is recommending phased approach given the current infrastructure might not fully support FRA in this area, meanwhile, the proposed new ATS routes could immediately and effectively improve the connectivity and airspace efficiency in the short term, which help to address the operational challenges due to geopolitical tensions, etc. However, in the long run, IATA would recommend implementing the FRA concept and expanding to cross-border airspace. |
| 34. | Sep 15 2025 2:49 PM | Proposing both new ATS routes and FRA implementation unfairly burdens the ANSPs and increases costs. Why would IATA propose both when they always raise ANS charges as an issue? |
| | | <ul style="list-style-type: none"> Thanks for the question. Actually, this is the original intention that IATA carrying out special project and help the ANSP to conduct comprehensive evaluation on the cost/benefit in implementing different proposed scenarios. And similar to the previous answer, the multi-tier roll out to the system is recommended as the existing infrastructure might not be ready for full implementation of the concept, however, the current challenges in connectivity and airspace capacity have to be addressed in a more simplified manner. In the meantime, IATA would support all the ANS charges initiatives under the guidance from ICAO Doc 9082 and Doc 9161 and the four key charging principles (nondiscrimination, cost-relatedness, transparency and consultation with users). |
| 35. | Sep 16 2025 1:41 PM | What are the requirement to join the UPR trial? |
| | | <ul style="list-style-type: none"> The trial was developed between four ANSPs that are members of the ASPAC ANSP Advisory Committee who in turn invited their 'home' carriers to participate. Requirements were simply to be compliant with the airspace rules for each FIR for UPR or 'off-route' planning according to AIP SUPs or other documents published by the ANSPs (generally RVSM, RNP10 / RNAV10, GNSS, ADS-B), and to be capable of flight planning and flying UPRs. The trial won't continue past 31 October but UPRs will still be available in some form in accordance with ongoing published procedures or any new AIP SUPs. |

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| 36. | Sep 16 2025 1:44 PM | (Mr. John Moore, IATA) What do you think of what the biggest challenges for Asia-Pacific States are adopting FRA are? |
| | | <ul style="list-style-type: none"> Biggest challenge for ANSPs would be for ATCs to manage the change from expecting flights to be on fixed routes to having multiple different trajectories on any given day. A modern ATM automation system is also necessary to move to a full FRA environment so as to provide ATCs with the necessary automation tools to manage the new traffic mix. For new entrant airlines, the challenge is to have the required CNS capabilities, and a flight planning system capability with trained personnel that are able to utilise it and create UPR flight plans. |
| 37. | Sep 16 2025 2:05 PM | How can we build a regional implementation roadmap like in Europe and Central America? (To ICAO and IATA) |
| | | <ul style="list-style-type: none"> The steps taken in the SEA-O FRO trial provides example of how the FRA volume can be increased by incrementally adding adjacent FIRs that agree to permit UPR planning using the same operational procedures and requirements. The project team is developing guidance material with lessons learnt for more States and airlines in ASPAC to join in the future. |