British Airways

Your response

Question	Your response
Question 1: Do you agree with our proposal that 'Phase 1' protections would be required to avoid the potential for significant disruption at ports and airports?	Confidential? – N As an airline, it is agreed that Phase 1 protections are needed around airports due to the potential for blocking of Satcom Receivers fitted to aircraft while on ground within the airport boundary. This considers aircraft which are operational at the airport terminal, and aircraft which are under maintenance in the Hangars or at remote maintenance stands. The protection zone is desired to accommodate the entire airfield footprint. For operational aircraft, blocking of Satcom Receivers risks delay to the departure, and may incur routing changes, because of the dependence upon operative Satcom for navigational & communication capability requirements for certain regions of airspace. If a Satcom connectivity test cannot be achieved on ground, this gives uncertainty to whether the Satcom system on the aircraft is either blocked from interference, or is defective. In such a scenario where the serviceability of the aircraft satcom system is unknown, a declaration of inoperative Satcom may be reported to Air Traffic Control (ATC) by re-submitting the Flight Plan. If this is identified close to the scheduled time of departure, this process can induce a delay to that departure. If the planned route requires operative Satcom to receive ATC instruction then entry to that route may be denied, with re-routing at lower than optimum cruise altitude, or a lateral diversion through a longer route. This gives risk to penalties through delay, and additional fuel carriage and burn which has a green impact on the operation.

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	For example, flights crossing the North Atlantic must have operational Satcom (iaw ICAO NAT Doc 007) to operate in the optimum altitude band and on the most efficient routings. Additional fuel must be carried and burnt if Satcom is not confirmed as fully operational before departure. For aircraft under maintenance, Satcom connectivity tests are needed to carry out scheduled maintenance checks, and during the investigation & rectification of reported Satcom defects. If the Satcom connectivity cannot be achieved due to blocking of the receiver due to interference, the scheduled tasks cannot be completed, or repairs cannot be proven to have fixed an incoming defect. Each of these scenarios jeopardize the aircraft being released from maintenance back to operational service in an optimal configuration (i.e. working Satcom and without additional contingency fuel load).
Question 2: Do you agree with the list of airports we propose to protect, in Annex A8?	Confidential? – N British Airways agrees with the list.
Question 3: Do you have any comments on the two options we have proposed for the ports which would require protection, noting the further detail (and requests for specific evidence) in Annex A7?	Confidential? – N Question not applicable to British Airways.
Question 4: Do you agree with our preference to reduce these restrictions to 'Phase 2' levels over a shorter timeline than the natural lifecycle of the terminals?	Confidential? – N BA do not agree to reduce to 'Phase 2' over a shorter time period, as the proposal to do so is based upon incorrect assumptions that are cited in Paragraph 3.28 of the consultation document. The employed assumptions are that upgrade paths for aircraft Satcom Receivers are planned & available, and that airlines elect to routinely upgrade a Satcom Receiver naturally over time

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	and therefore that cost to upgrade will always be budgeted for and incurred at some point within the life of the aircraft. These assumptions are not correct. Avionics cannot be treated with the same consideration as commercial electronics. Currently, certified upgrade paths do not exist for aircraft Satcom Receivers, as they have not been developed and certified by the Satcom OEMs and aircraft manufacturers. The process of upgrading a typical aircraft system is complex; it takes time to progress through to delivery, and is expensive; all due to the regulatory and compliance requirements associated with this activity. The development cycle of an aircraft system upgrade, appliance and product certification etc. is discussed further in the response to Question 5. Hypothetically, if an upgrade path were available, an aircraft Satcom system upgrade will only be initiated by an airline if there is a driving reason to do so. An upgrade will not be initiated simply for the sake of upgrade. A Satcom Receiver installed upon an aircraft will typically be maintained in an as-is state for the duration of life of the aircraft (25-30 years). As such, implementing a Satcom Receiver upgrade on aircraft as a result of the proposed auction (and the associated costs involved), is extraordinary to an airline's aircraft cost of ownership, and cannot be considered business as usual for an airline.
Question 5: Taking into account the further detail in Annexes A7 and A8, please provide any evidence: • that a shorter period, around five years, for the relevant receivers to be replaced or upgraded is not technically or practically feasible; or • of the impact that a longer period of up to 20 years may have on the ability of MNOs to use the spectrum and the	Confidential? – N As referenced in the response to Question 4, upgrade paths for Satcom Receivers are not currently available. To illustrate, the following development cycle may be considered: The airline expresses the need for a change (upgrade) of the aircraft system to the system integrator, which is usually the aircraft designer (Type Certificate Holder), or a third party design organisation that has approval to amend that aircraft's design (Supplemental Type Certificate Holder), whom will then liaise with the system OEM to define and develop the technical solution. New

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benefits to consumers and citizens that would be foregone.	equipment (articles) developed by the OEM to satisfy the change will go through certification with the aviation regulator (e.g. the FAA) against a Technical Standing Order (TSO), Satcom equipment for example is certified against TSO-C159. While a product may commercially exist off-the-shelf to meet this requirement, only if it is certified against the TSO (i.e. meets specified minimum performance requirements) can it be considered for integration within an aircraft system. However, a TSO certification alone does not make the article 'airworthy', and it may not yet be installed on an aircraft. The TSO certified article must then be integrated into the aircraft's type design by the Type Certificate Holder or Supplemental Type Certificate Holder to demonstrate that the airworthiness requirements are met. This integration certification process varies depending upon the complexity of the system and the level of change, and in some cases may require flight tests. At present, there is only one product known to be developed by one Satcom system OEM that hardens a Satcom receiver against LTE and 5G interference, known as a 'Type J' Diplexer Low Noise Amplifier (DLNA), which has achieved TSO-C159 article (product) certification by the FAA. However there are no existing aircraft type design certifications which integrate it into a Satcom system on any commercial aircraft. This means a retrofit campaign on aircraft may not yet commence. To achieve TSO certification, a typical timeline involves several steps, including design development, testing, application submission, and regulatory review, with the duration varying depending on the complexity and type of equipment. While the exact timeline can vary, it generally takes several months to a year or more for the Satcom system OEM to complete the entire process. To achieve aircraft type design certification such as an STC (Supplemental Type Certificate) typically takes 3 to 6 months for straightforward modifications, but can extend to over a year for complex changes. The timeline depends on the scope of the modification, the workload

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	of the certification authority (like the FAA), and the efficiency of the applicant's engineering and MRO (Maintenance, Repair, and Overhaul) team. Considering the scenario wherein the upgrade path, and production of TSO certified equipment are available, an airline may then be in a position to launch a retrofit campaign. To implement a Satcom equipment retrofit, the airline will plan the activity so as to reduce the period for which the aircraft is unavailable for commercial operations, and so the work is performed within the most suitable environment. The outcome of this typically is the retrofit will be planned during periods of planned maintenance on the aircraft, where it will be in the hangar for a reasonable amount of time where access to all parts of the aircraft is feasible. Longhaul aircraft will typically exist on a maintenance cycle which has them in the hangar for a period between 10-days to 6-weeks (depending upon the level of maintenance that is scheduled for that point in the aircraft's life), once every 3 years, which may be considered to be a typical 'heavy maintenance' cycle. Therefore, a retrofit campaign will co-exist on this maintenance cycle, so that the retrofit will take 3 years to be rolled out across that fleet. To summarise, there are no available retrofits for any airline to implement at present. Only once an article TSO, and an aircraft type design certification have been approved, may an airline begin to plan a retrofit, which would take up to 3 years to implement. Airline manufacturers are this time are not showing any intention to invest time and resource into producing a change to the Satcom systems on aircraft, because there is no regulatory mandate, nor any technical change driving them to do so. If the aircraft manufacturers did elect to introduce such a change, this may take several years until the retrofit is available to the airline. It is therefore very likely that aircraft which were built and equipped with older Satcom Receivers (e.g. those systems most at risk of blocking) will remain with that equipment until they retire, and no upgrade will be possible throughout their lifetime, and therefore older aircraft Satcom systems will

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	disappear only on attrition and will not be accelerated by product upgrade.
Question 6: Do you agree with our proposal not to put in place restrictions on IMT use of this spectrum to protect: (a) land terminals; (b) potential future uses of the 1.5 GHz spectrum; or (c) PMSE users. In this regard, we particularly welcome: • any evidence that Inmarsat's land terminals are used for the operation of critical national infrastructure or safety purposes; • any evidence that it is not technically or practically feasible to replace Inmarsat land terminals, including through alternative solutions or upgrades; and • any evidence on the impact of protecting land terminals on the ability of mobile network operators ("MNOs") to use the spectrum and the benefits to consumers and citizens that may be foregone.	Confidential? – N Question not applicable to British Airways.
Question 7: Are you able to provide any evidence on the likelihood of audio links suffering interference from IMT use of 1492-1517 MHz?	Confidential? – N Question not applicable to British Airways.
Question 8: Do you agree with our proposed approach to coordination?	Confidential? – N British Airways agrees to the coordination, and favourably supports the implementation of the PFD limited zone around operational areas of the airport.

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Question 9: Do you agree with our proposal to define PFD limited zones as complex polygons? Would defining them as a set of points, rather than an entire boundary, make coordination calculations easier for licensees?	Confidential? – N British Airways is a beneficiary of the PFD and Coordination Zones and will not be involved in their determination and operational constraint, so a strong preference of their definition is not offered. British Airways' main concern; whichever option is chosen, provided that the airport footprint remains fully protected at all times, British Airways remains agnostic to that definition of the PFD limited zone.
Question 10: Do you agree with our provisional view that not defining coordination zones around ports may be simpler for licensees than complying with multiple different coordination zones, particularly while Phase 1 PFD limits are in place?	Confidential? – N As per the response to Question 9, British Airways remains agnostic to that definition of the coordination zones provided that the airport footprint remains fully protected at all times.
Question 11: Do you have any feedback on the coordination procedures (as set out in Annex A10) or the specific parameters proposed?	Confidential? – N Question not applicable to British Airways.
Question 12: How difficult would you find it to comply with our proposed coordination requirements? In particular, we are interested in information from potential licensees on how the proposed coordination zones would affect their deployment processes and decisions.	Confidential? – N Question not applicable to British Airways.
Question 13: Do you have any comments on our proposal that licensees should carry out their own coordination, on the basis of coordination parameters set by Ofcom?	Confidential? – N British Airways prefer that Ofcom perform the coordination and seek to avoid the risk of inconsistency resultant from self-policing of protection zones by licensees which may occur if OFCOM do not coordinate this activity. This could lead to unregulated activity in a protection zone.

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Question 14: Do you have any comments on our proposed technical licence conditions?	Confidential? – N British Airways partially agrees, with the exception of the Phase 2 PFD limits around airports. The nature of this objection is referred to in earlier response however, may be summarised in that there is no currently available upgrade path for aircraft equipped with older Satcom receivers, and nor is there likely to be. Thus these aircraft will remain at greater risk of being blocked for the duration of their service life and will have no means of being hardened against the reduction of protection under Phase 2 PFD limits.
Question 15: Do you have any comments on the non-technical licence conditions that we propose to include in the award licences?	Confidential? – N Question not applicable to British Airways.
Question 16: Do you have any comments on the proposed format for the auction?	Confidential? – N Question not applicable to British Airways.
Question 17: Do you have any comments on the proposed bidding options for the auction? Do you believe we have excluded any bidding options which would be worth identifying?	Confidential? – N Question not applicable to British Airways.
Question 18: Do you have any comments on our proposed information policy or reserve price?	Confidential? – N Question not applicable to British Airways.
Question 19: Do you have any other comments on the proposals or analysis set out in this consultation document?	Confidential? – N Satcom has become a fundamental part of a modern long haul commercial airliner. It is required for regulatory, operational and commercial reasons. Any new influence that could causing blocking of the satcom signal would adversely affect an airline's ability to maintain

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	compliance with these requirements. The aviation regulators only permit Satcom to be unserviceable for short periods of time due to the way the system is integrated into airline operations. If the system is unserviceable there are restrictions on how far an aircraft can be from an airfield at any point in the flight which may mean the most optimal routing cannot be flown. This may increase fuel required for a flight. The inability to maintain and function check an aircraft satcom system within an unprotected zone would lead to an unmaintainable Satcom system. This would place a number of satcom hosted functions at risk including: • ICAO Long range communications equipage requirement including SATVOICE and CPDLC • ADS-C tracking • Aircraft 15 minutes tracking requirement • North Atlantic High Level Airspace (NAT HLA) entry requirements • 24 hour Medical support coverage via Medlink • Ability to manage enroute emergency situations including diversions in areas without VHF coverage Satcom is the only means of data communication in remote Oceanic areas where VHF is not available. BA operates many services a day across the NAT HLA area. To fly the most efficient lateral tracks where reduced separation rules apply at the flight levels where fuel burn is the lowest requires a serviceable Satcom system before departure (NAT Doc 007 6.2.16). Air Traffic Control are notified of the status of the Satcom system in the flight plan filed before departure and this determines the routing and flight level allocated to the flight in the Oceanic portion of the flight. If this status is not accurate this increases workload for flight crew and controllers as revised routings and flight levels have to be negotiated in flight. CPDLC which requires Satcom to function has become the normal means of communication with ATC in many areas of the world, and units are resourced taking this into account. To remove the ability to reliably use CPDLC

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	would increase workload for ATC and for flight crew with an associated risk to safety of flights. ADS-C is used by ATC to interrogate the routing loaded in an aircraft's flight management system (FMS) to ensure the correct waypoints are loaded. This is an important barrier to a gross navigational error (GNE) which could ultimately lead to a Mid Air Collision between aircraft if it is not available. Aircraft without serviceable ADS-C will not be allowed to operate in areas with the most closely spaced tracks and this again has the potential to affect the amount of fuel required to operate a flight as non-optimal routings may be required.

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