

Title: CAA Rule Making Tasks 0124 and 0125 Date: 18/01/2023 DMA No: DfDMA273 Lead department or agency: Department for Transport Other departments or agencies: Civil Aviation Authority		De Minimis Assessment (DMA)	
		Stage: Final	
		Source of intervention: Domestic	
		Type of measure: Secondary	
Summary: Rationale and Options		Contact for enquiries: aviationsafety@dft.gov.uk	
Total Net Present Value Not Quantified	Business Net Present Value Not Quantified	Net cost to business per year <small>(EANDCB in 2019 prices)</small> £0.21m	

Summary of Impacts – Explanatory Memorandum Impact Section

The Department for Transport (DfT) has not published an impact assessment for this measure as the direct impacts on business have been assessed at under £5m per year. Instead, light-touch internal analysis has been conducted, the findings of which are presented below.

The three proposed amendments are expected to lead to total transition costs of £2.10m, consisting of staff time to train awareness of the new regulations, and one-off administrative costs. There are further ongoing costs of £2,300 per annum due to requirements to maintain Instructions for Continued Airworthiness, and annual costs of £5,000 due to additional staff time on fatigue testing.

Benefits have not been monetised but primarily come in the form of enhanced safety outcomes for aircraft. While safety incidents are rare, they can result in loss of life, costs to airports and airlines, and impacts on wider business. The legislation will additionally enhance competition and lower costs for aircraft maintenance organisations.

Rationale for intervention and intended outcomes

The overarching policy objective of the proposed amendments is to enhance the safety of aircraft operations through proportionate regulation.

Clarification of Instructions for Continued Airworthiness (ICAs) is necessary as some firms do not currently face the full costs of safety related incidents as a result of poorly maintained ICAs. ICAs are the maintenance data produced by the design approval holder to assure the continued airworthiness of that product or article. Such costs may accrue to the operators of aircraft, the customers of these operators, or the wider public. There is a need to ensure all design approval holders maintain high quality ICAs to address this externality. Furthermore, there may be an information failure, with some firms not fully understanding how maintenance organisations use their ICAs, and thus are not currently providing them in the most accessible and understandable format. Clearer guidance on this will ensure that all ICAs are produced in line with the needs of their end users, ensuring that safety is enhanced through increased quality of maintenance procedures.

Amendments to Initial Airworthiness requirements covering the design, certification and transfer to production of aircraft parts (Part 21 requirements) to address ageing aircraft aspects are likewise necessary to correct externalities. This will also bring Part 21 requirements in line with the Additional Airworthiness Requirements, which cover all areas of aviation, airworthiness and operations (Part 26 requirements), as updated in November 2021. This will address safety risks related to ageing phenomena in the structures of large aeroplanes.

Amending the eligibility of parts to be used during maintenance is necessary to remove existing red tape that unnecessarily restricts market activity. This will result in lower parts costs, both directly through administrative costs, and further by widening the range of potential suppliers, while not impacting safety.

Describe the policy options considered

Option 0 – Do Nothing – Maintain existing requirements pertaining to the continued airworthiness of aircraft and aeronautical products.

Option 1 (preferred option) – Implement the three amendments listed below to ensure continued airworthiness requirements are robust, consistent, and proportionate. This option is the preferred option since it is the only option which achieves the stated policy objectives, internalising the identified externalities and ensuring firms have the information necessary to make effective decisions.

Amendment A: Clarification of Instructions for Continued Airworthiness (ICA)

Amendment B: Eligibility of parts to be used during maintenance (without a CAA Form 1)

Amendment C: Amendment to Part 21 to address ageing aircraft aspects

Rationale for DMA rating

The analysis contained within this assessment shows that this policy satisfies the De Minimis Threshold. Many of the potentially affected organisations already satisfy the requirements of the policy as they are required to under the conditions of their third-party European approvals. For the remaining organisations, we estimate that the policy has an Equivalent Annual Net Direct Cost to Businesses (EANDCB) of £0.21 million and therefore falls within the £5 million De Minimis Threshold. There is deemed to be no material risk of the realised cost exceeding the threshold as the identified costs are substantially below this level, and there are no areas of uncertainty that could cause these costs to fluctuate by the orders of magnitude required.

Will the policy be reviewed? No	If applicable, set review date:			
Are these organisations in scope?	Micro Yes	Small Yes	Medium Yes	Large Yes

Senior Policy Sign-off: ✓ Date: 18/01/2023

Peer Review Sign-off: ✓ Date: 04/01/2023

Better Regulation Unit Sign-off: ✓ Date: 04/01/2023

1.0 Policy Rationale

Policy background

1. The proposed regulation seeks to amend UK Regulation (EU) No.748/2021 and UK Regulation (EU) No.1321/2014, which set out requirements for the continued airworthiness of aircraft and aeronautical products.

2. The regulation consists of three separate but interlinked amendments, namely:

A) To address the issue of interpretation in the current rules and standards in relation to Instructions for Continued Airworthiness (ICA). Currently, Type Certificate Holders (TCH) i.e. airframe designers, interpret differently what a complete set of ICA is and to what level they are required to control the data.

B) To permit the production of parts and appliances defined by Design Organisation Approval (DOA) Holders without the need to certify their conformity with the approved design data (through the issuance of a CAA Form 1 or equivalent) in cases where their effect on the safety of the operation of an aircraft is assessed as negligible. Also, to permit the installation of such appliances in type-certified products. Similarly, it is proposed that these parts should be

exempted from the requirement to be maintained by a maintenance organisation approved in accordance with UK Maintenance Organisation Requirements (Part 145 requirements).¹

C) The amendment to Part 21 (Initial Airworthiness Requirements) to address ageing aircraft aspects. The Part 26 (Additional Airworthiness Requirements) rule change made in November 2021 addressed ageing aircraft issues. It retrospectively covers changes and repairs that are already completed. Now, in addition, it is necessary to amend existing Part 21 rules to achieve the same level of safety when large aeroplane structure will be subject to future structural changes or repairs, and to add a requirement that current or future holders of the type-certificate or restricted type-certificate for a large aircraft shall ensure that the continuing structural integrity programme remains valid throughout the operational life of the aeroplane.

A – Clarification of Instructions for Continued Airworthiness (ICA)

3. Type Certificate Holders are currently required to provide Instructions for Continued Airworthiness to ensure that operators of aircraft, Maintenance Organisations (Mos) and Continuing Airworthiness Management Organisations (CAMOs) have detailed guidance on maintenance procedures. This requirement also applies to Design Organisation Approval Holders in relation to the airworthiness of their components.

B – Eligibility of parts to be used during maintenance (without a CAA Form 1)

4. A part or appliance is only eligible for installation in type-certified products when it is released with a CAA Form 1.² Similarly, in UK Regulation (EU) 1321/2014 Part M and Part 145, this is repeated with the addition that the part or appliance must be accompanied by a CAA Form 1 or equivalent.
5. Except as permitted in the regulation for European Light Aircraft, only standard parts can be installed without a CAA Form 1 or equivalent. In this context, a part is considered a standard part when it is designated as such by the DAH responsible for the product, part or appliance, in which the part is intended to be used. In order to be considered a standard part, all design, manufacturing, inspection data and marking requirements necessary to demonstrate conformity of that part should be in the public domain and published or established as part of officially recognised standards, such as British Standards.

C – Amendment to Part 21 to address ageing aircraft aspects

6. The “ageing aircraft” rules addresses safety risks relating to ageing phenomena in the structures of large aeroplanes. These risks include fatigue of the basis type design, widespread fatigue damage (WFD), corrosion, fatigue of changes and repairs, and continued operation with unsafe levels of fatigue cracking.
7. Part 21 establishes requirements for initial airworthiness, while Part 26 establishes additional airworthiness requirements.

Problem under consideration

A - Clarification of Instructions for Continued Airworthiness (ICA)

8. There is currently variation in ICAs across DOA Holders in relation to identification, approval, formatting, and availability to end users. Some ICAs may therefore not provide sufficient information to ensure safety. Two previous aviation safety incidents have been linked to this:
9. In one incident *“smoke on the flight deck and in the cabin was followed by an engine shut down and an emergency landing because a maintenance action from a component maintenance*

¹ <https://www.caa.co.uk/commercial-industry/aircraft/airworthiness/approval-information-and-guidance/part-145-holders-guidance/>

² In accordance with point 21.A.307 (Part 21 Subpart K - Parts and Appliances)

manual (CMM) had not been performed". This resulted in a safety recommendation from the European Union Aviation Safety Agency (EASA) asking *"for guiding rules to be set for airframe and engine manufacturers such that maintenance planning documents (MPDs) and engine maintenance manuals (EMMs) clearly include recommended maintenance information from the CMM of subcomponents."*³

10. In another, an *"aircraft crashed after a loss of control in instrument meteorological conditions due to a defective vacuum pump because its maintenance had not been performed"* with a recommendation for greater compliance with *"vacuum pump maintenance and replacement requirements"*.⁴
11. While such events are uncommon due to the high level of safety requirements in the aviation sector, it is evident that ICAs being insufficiently clear or being unavailable to certain organisations can and does result in safety incidents.

B - Eligibility of parts to be used during maintenance (without a CAA Form 1)

12. The current requirements outlined above create problems and uncertainties. For years, the industry has been using the term 'commercial parts' to refer to parts that are not designed or manufactured specifically for aviation (such as light bulbs, fire axes and smoke detectors). Whereas a standard part specification is developed by a consensus standards organisation and is publicly available (e.g. National Aerospace Standards (NAS), Army-Navy Aeronautical Standard (AN), Society of Automotive Engineers (SAE)), the design of a commercial part is developed privately. Therefore, these parts cannot be considered standard parts and when installed as replacement parts they would need a CAA Form 1.
13. The CAA recognises that it is unrealistic to expect manufacturers that make thousands of parts for non-aviation uses every day, and relatively few parts for use in aviation, to obtain a Production Organisation Approval allowing them to issue a CAA Form 1. As a result, the number of suppliers of these products is unnecessarily restricted, with a corresponding impact on prices.

C - Amendment to Part 21 to address ageing aircraft aspects

14. The Additional Airworthiness regulations (Part 26) rules were changed in November 2021 to retrospectively cover the original approved design, in addition to changes and repairs that are already implemented. These rule changes also require TCHs for aircraft in service to keep up to date knowledge about ageing factors on the basis of real time operational experience and to use modern tools of analysis and testing, such as feedback from scheduled maintenance and Damage Tolerance Evaluation to introduce new inspections as required. The purpose of these changes was to improve safety, including reducing the risk of structural fatigue failure.
15. However, Initial Airworthiness requirements for new aircraft structures, repairs and modifications (Part 21 rules) do not currently mandate the same level of safety and this amendment is therefore required to align the Initial Airworthiness rules with those for Additional Airworthiness, and to clarify both regulations.
16. Structural fatigue failure is a rare occurrence in aviation, but has catastrophic consequences, as illustrated in the case studies below.:

Case Study 1 – Aloha Airlines Accident⁵

- a) An early illustration of the extent to which the controls against fatigue failure introduced during the early years of the 'jet age' might be inadequate was delivered by a 1988 incident to a 19-year-old Boeing 737-200, which on an internal flight in Hawaii suffered sudden structural failure and an explosive decompression at FL240. Nearly 6 metres of cabin skin and structure aft of the cabin entrance door and above the passenger floor line separated from the aircraft.

³ SR ICLD-2013-001: Boeing 757-200 TF-FIJ, Icelandair, 85 NM south-south-east of London Gatwick Airport on June 4, 2009.

⁴ SR UNKG-2007-004: Piper PA-28R-201T G-JMTT, near 9 NM south of Oban Airport, Argyll (Scotland) on April 9, 2007

⁵ <https://www.ntsb.gov/investigations/AccidentReports/Reports/AAR8903.pdf>

- b) The investigation found de-bonding and fatigue damage which had led to the failure. For that aircraft, at least, the introduction of static test hulls with simulated hours and cycles kept well ahead of equivalent in-service aircraft was not sufficient. This aircraft had completed 89 680 flight cycles with an average flight time of only 25 minutes, almost all of them in the marine environment of the Hawaiian Islands, a somewhat atypical service life which was considered to have allowed corrosion to increase the likelihood of fatigue.

Case Study 2 – Grumman G73T Accident⁶

- a) An example of dramatic and fatal structural fatigue was a 58-year-old Grumman G73T Turbo Mallard Seaplane which in 2005 shed the complete right-hand wing whilst on a domestic revenue flight in the USA when the main spar failed.
- b) The investigation found that the right wing separated from the aircraft because of multiple pre-existing fatigue fractures and cracks which reduced the residual strength of the wing structure.
- c) Other examples of Widespread Fatigue Damage (WFD) occurring in the fleet include: an in-flight Lockheed Model L-1011 failure of aft pressure bulkhead stringer attach fittings; a McDonnell Douglas Model DC-9 aft pressure bulkhead cracks; Boeing Models 727 and 737 lap splice cracking; Boeing Model 767 aft pressure bulkhead cracking; and Boeing Model 747 and Airbus A300 frame cracking.

Rationale for intervention

A - Clarification of Instructions for Continued Airworthiness (ICA)

- 17. Type Certificate and Design Organisation Approval Holders do not currently face the full costs of safety related incidents as a result of poorly maintained ICAs. Such costs may accrue to the operators of aircraft, the customers of these operators, or the wider public. There is a need to ensure all approval holders maintain high quality ICAs to address this externality.
- 18. There may also be an information failure, with some DOAs not fully understanding how maintenance organisations use their ICAs, and thus are not currently providing them in the most accessible and understandable format. Clearer guidance on this will ensure that all ICAs are produced in line with the needs of their end users.

B - Eligibility of parts to be used during maintenance (without a CAA Form 1)

- 19. Existing regulations place unnecessary requirements on the manufacturers of non-safety critical aviation components. This government failure results in higher parts costs, both directly through administrative costs, and further by restricting the range of potential suppliers. Government intervention is required to remove this red tape and ensure that production requirements are proportionate.

C - Amendment to Part 21 to address ageing aircraft aspects

- 20. Part 21 rules do not achieve the same level of safety as Part 26 rules, which were amended in November 2021. Type Certificate Holders and Design Organisation Approval Holders do not currently face the full costs of safety related incidents, which may accrue to the operators of aircraft, the customers of these operators, or the wider public. There is a need to amend the current Part 21 rules to ensure that all design approval holders fully address the safety risks relating to ageing phenomena in the structures of large aeroplanes.

Policy objective

- 21. The overarching policy objective of the proposed amendments to the UK Regulation (EU) No. 748/2012 and UK Regulation (EU) No. 1321/2014 is to enhance the safety of aircraft operations

⁶ <https://www.nts.gov/investigations/AccidentReports/Reports/AAR0704.pdf>

through proportionate regulation. The three proposed amendments have specific objectives as follows:

A - Clarification of Instructions for Continued Airworthiness (ICA)

22. The objective of this rulemaking task is to establish clear requirements and responsibilities for all parties involved in the production of ICAs, their approval and their implementation.
23. The policy aims to clarify the status of the ICA and the responsibilities of Design Organisation Approval and Type Certificate holders in order to improve the continuing airworthiness of all aircraft that are within the scope of the Basic Regulation, therefore, to improve safety. The policy will ensure that Maintenance Organisations (MOs) and Continuing Airworthiness Management Organisations (CAMOs) have all the necessary data to perform maintenance in the correct way and all the applicable maintenance requirements to develop the aircraft maintenance programme.

B - Eligibility of parts to be used during maintenance (without a CAA Form 1)

24. The objective of this rulemaking task is to provide industry with flexibility for manufacturing companies not holding a Production Organisation Approval (POA), thus fostering a more proportionate system.

C - Amendment to Part 21 to address ageing aircraft aspects

25. The objective of this rulemaking task is to address safety risks related to ageing phenomena in the structures of large aeroplanes. These risks include fatigue of the basic type design, Widespread Fatigue Damage (WFD), corrosion, fatigue of changes and repairs, and continued operation with unsafe levels of fatigue cracking.

Options considered

Option 0 – Do Nothing – Maintain existing requirements pertaining to the continued airworthiness of aircraft and aeronautical products.

Option 1 (preferred option) – Implement the three amendments outlined above to ensure continued airworthiness requirements are robust, consistent, and proportionate. This option is the preferred option since it is the only option which achieves the stated policy objectives.

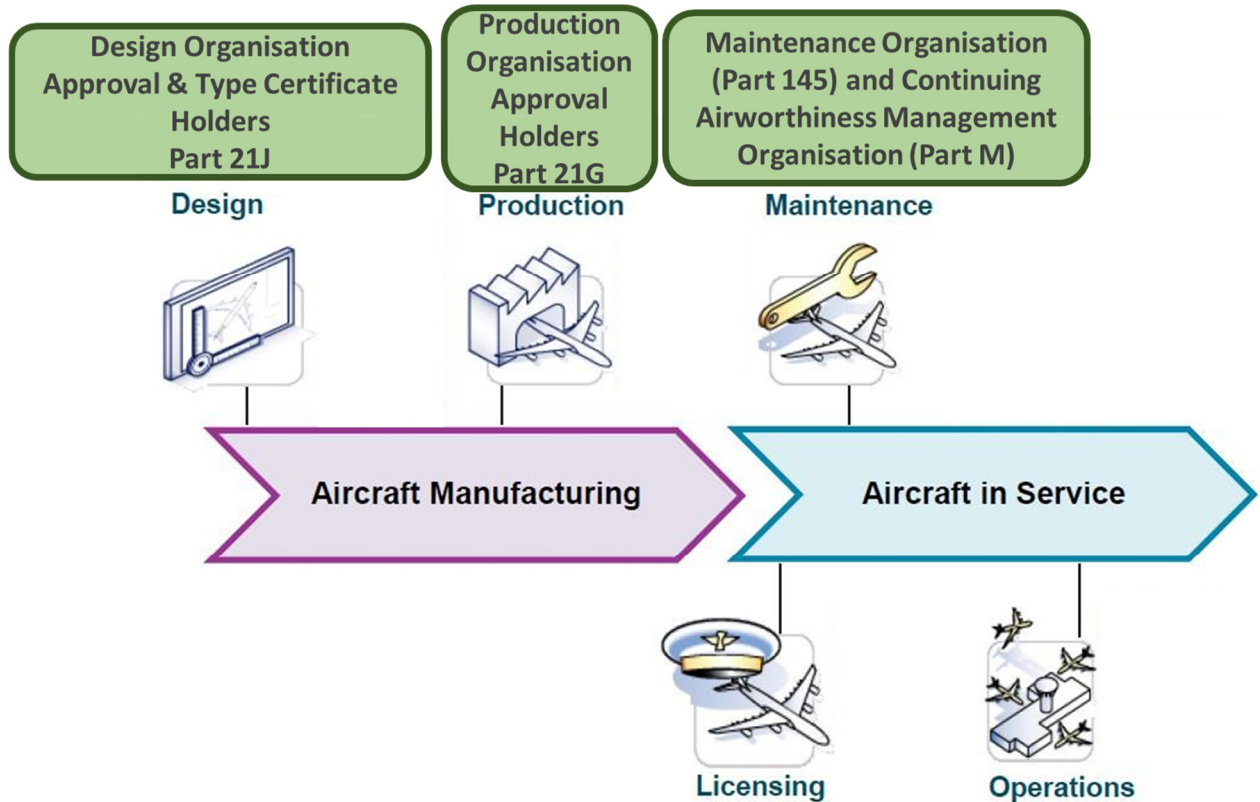
2.0 Rationale for De Minimis Rating

26. The analysis contained within this assessment shows that this policy satisfies the De Minimis Threshold. Many of the potentially affected organisations already satisfy the requirements of the policies. For the remaining organisations, we estimate that the policy has an Equivalent Annual Net Direct Cost to Businesses (EANDCB) of £0.21 million and therefore falls within the £5 million De Minimis Threshold.
27. Given the low magnitude of the EANDCB relative to the £5 million threshold, it is considered highly unlikely that the threshold would be exceeded, even if the costs of the policy have been underestimated.
28. The primary benefit of the regulation is an anticipated improvement in the safety record of affected organisations. The improved safety record is likely to lead to a number of subsequent benefits. It has not been possible to monetise these anticipated benefits and their likely scale is not known with any certainty. However, these are deemed to be indirect and therefore not within the scope of the EANDCB calculation.
29. We do not expect there to be significant distributional impacts, disproportionate burdens on small businesses, any significant wider social, environmental, financial or economic impacts or for there to be a novel or contentious element to the regime.

3.0 Costs and Benefits

Option 0 – Baseline

30. There are no costs or benefits associated with this option as this is the counterfactual and will therefore be used as the baseline against which to compare further options. The figure below outlines the existing state of the market.⁷



Option–1 - Implement three amendments to ensure continued airworthiness requirements are robust, consistent, and proportionate

Summary

A - Clarification of Instructions for Continued Airworthiness (ICA)

Monetised Costs- Transition

- Costs associated with employee training (businesses, direct)
- Administration costs linked to Exposition/Handbook updates (businesses, direct)

Monetised Costs- Ongoing

- ICA administration cost (businesses, direct)

Unmonetised Benefits

- Enhanced safety (direct)
- Cost savings resulting from avoided diversions (businesses, indirect) – relates to first proposed amendment only

Cost savings resulting from avoided emergency maintenance (businesses, indirect)

B - Eligibility of parts to be used during maintenance (without a CAA Form 1)

Monetised Costs- Transition

⁷ Simplified version of an EASA diagram focussing only on regulations relevant to this assessment. A number of additional regulations apply that have been excluded.

- Costs associated with employee training (businesses, direct)
- Administration costs linked to Exposition/Handbook updates (businesses, direct)

Unmonetised Benefits

Reduced production costs for non-safety critical components (businesses, direct)

C - Amendment to Part 21 to address ageing aircraft

Monetised Costs- Transition

- Costs associated with employee training (businesses, direct)
- Administration costs linked to Exposition/Handbook updates (businesses, direct)

Monetised Costs- Ongoing

- Additional work hours cost (businesses, direct) – relates to third proposed amendment only

Unmonetised Benefits

- Enhanced safety (direct)
- Cost savings resulting from avoided emergency maintenance (businesses, indirect)
- Cost savings through potential of extending aircraft economic life (businesses, indirect) – relates to third proposed amendment only

Costs

Number of affected businesses and employees

31. Many of the calculations contained within this impact assessment depend to a large extent on two key parameters, namely the number of businesses that will be impacted by the proposal and the number of employees that work for these businesses that will be impacted (e.g. need training). These parameters were estimated using CAA data⁸ regarding organisations holding any of the following UK airworthiness approvals: Part 145 for maintenance; Part CAMO for continuing airworthiness; Part 21G for production; and Part 21J for design.
32. Any UK airworthiness organisation can hold multiple UK and foreign approvals. In order to establish the number of approvals that will be directly affected by the proposed amendments, duplications at the approval level were identified and eliminated as follows.
33. In November 2021, EASA introduced these requirements into Regulation 748/2012 and 1321/2014. By the time the UK will legislate these requirements, the UK organisations holding EASA third country approvals (where appropriate), will already have processes and procedures in place as part of their foreign approval compliance process. EASA records show that 212 Part 145 organisations hold such approval at the time of writing this Impact Assessment paper. These organisations were discounted.
34. Out of the data set group the below number of organisations were identified as being directly affected by these changes:
 - 64 UK Design Organisation Approval Holders, Part 21J (of which two are Type Certificate Holders)
 - 129 UK Production Organisations Approval Holders, Part 21G
 - 82 UK Maintenance Organisations Approval Holders, Part 145 (excluding those with EASA Approval)
 - 150 UK Continuing Airworthiness Management Organisation Holders, Part CAMO.

A total of 425 approvals will be affected by the proposed amendments.

⁸ Internal CAA records concerning Approval Holders

35. The total number of employees employed by the 425 affected approval organisations is 22,552. This figure has been used in the calculations below. The number and size of these approval holders are detailed in Table 1 below:

Table 1: Number and size of relevant organisations (source – CAA internal data)

Size (no. of employees)	All	
	Organisations	No. of employees
=<10	86	526
11-20	95	1,249
21-50	103	3,123
51-100	103	7,096
101-500	29	5,163
501-800	9	5,395
Sub-total: <= 500 employees	416	17,157
Sub-total: > 500 employees	9	5,395
Total	425	22,552

Labour costs

36. In addition to the number of affected businesses, a key parameter impacting the calculations within this impact assessment are the assumed costs of labour within these affected businesses. The central cost scenario presented below adapts the approach detailed in the Regulatory Policy Committee’s guidance note on “implementation costs”⁹. Given that the regulation will primarily impact all employees within affected organisations, we have deemed it appropriate to use industry average wages in the calculations, rather than calculating according to the individual occupations of those undertaking the training.

37. It is anticipated that the regulation will affect businesses represented by the following Standard Industrial Classifications:

- **SIC 3030:** Manufacture of air and spacecraft and related machinery
- **SIC 3316:** Repair and maintenance of aircraft and spacecraft

38. We therefore use an hourly staff cost of £29.69 in 2022 prices, based on the mean hourly wage of employees within these two sectors¹⁰, which has subsequently been adjusted for inflation and uplifted by 26.5%¹¹ to account for inflation and non-wage costs (e.g. national insurance and pension contributions).¹²

39. The additional work hours impact (Amendment 3) will be undertaken specifically by engineers. Owing to data availability, it is only possible to obtain a wage estimate for engineers across all industries, rather than those working in the specific industries listed above. For this reason, it is deemed appropriate and proportional to use the industry average staff cost listed above when estimating the costs of additional work hours.

A - Clarification of Instructions for Continued Airworthiness (ICA)

Costs

40. We assume that businesses will face two types of cost as result of the implementation of this amendment: 1) training costs relating to implementation of the policy; and 2) ongoing

⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/827926/RPC_short_guidance_note_-_Implementation_costs_August_2019.pdf

¹⁰ <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry4digitsic2007ashtable16>

¹¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102783/tag-unit-A4.1-social-impact-appraisal.pdf

¹² This was derived from the mean hourly wage of employees within the two sectors from Table 16.5a of the Annual Survey of Hours and Earnings from 2021. The starting point of £22.82 was inflated by one year to bring the value to 2022 prices, then increased by 26.5% to account for non-wage costs, resulting in a total hourly cost of £29.69.

administration costs to coordinate the control of ICAs, due to contract updates and ongoing management.

Transition Costs

Staff training

41. The affected organisations will be required to provide training to their staff regarding the new legislation. This training would be incorporated as part of the pre-existing continuation training – a recurrent training required to take place annually across all aviation approvals. Based on advice from the CAA we have estimated that this would add 1 additional hour to the training syllabus for each of the 22,552 employees identified.
42. At an hourly staff cost of £29.69, this results in **a total training cost of £669,565** in the first year following implementation.

Updating Internal Procedures

43. In addition to the training requirement for all employees, it is anticipated that there will be a one-off requirement to update internal procedures and organisations' Exposition/Handbook. This is expected to take place at the approval holder level. We have assumed a time requirement of 3 hours additional administration for each of the 425 approvals based on advice from the CAA.
44. At an hourly staff cost of £29.69, this results in total administration costs of **£37,855** in the first year following implementation.

Ongoing Costs

Ongoing Administration of ICAs

45. Type Certificate and Design Organisation Approval holders would face ongoing costs to ensure updated ICAs are accessible to end users. Based on advice from the CAA, this is estimated at 8 hours per year for each TCH (of which there are 2), and 1 hour per year for each additional DOA (of which there are 62). Additional time is required for TCH due to the complexity of their ICAs, which will need to collate ongoing maintenance instructions for sub-components.
46. At an hourly staff cost of £29.69, this results in annual administration costs of **£2,316**.

Benefits

Unmonetised Benefits

47. The primary benefit is to enhance safety by ensuring users of aircraft and maintenance organisations have accessible and up to date instructions for continued airworthiness. While previous examples of failures resulting from poor ICAs have been identified, it has not been possible to estimate a change in the rate of such incidents. The rate of safety related incidents in the aviation sector is already very low, so any improvement is expected to be marginal.
48. Based on the case studies identified we can see a range of possible benefits in the case of an avoided incident. This could be in the form of avoiding the need to divert an aircraft, with associated savings for aircraft operators, and further avoiding the need for emergency maintenance. In extreme cases, this may prevent the loss of an airframe and the people on board.

B - Eligibility of parts to be used during maintenance (without a CAA Form 1)

Costs

49. We assume that businesses will face two types of cost as result of the implementation of this amendment: 1) training costs relating to implementation of the policy; and 2) administration costs to update internal procedures and expositions.

Transition Costs

Staff training

50. The affected organisations will be required to provide training to their staff regarding the new legislation. This training would be incorporated as part of the pre-existing continuation training – a recurrent training required to take place annually across all aviation approvals. We have estimated that this would add 1 additional hour to the training syllabus for each of the 22,552 employees identified.
51. At an hourly staff cost of £29.69, this results in **a total training cost of £669,565** in the first year following implementation.

Updating Internal Procedures

52. In addition to the training requirement for all employees, it is anticipated that there will be a one-off requirement to update internal procedures and organisations' Exposition/Handbook. This is expected to take place at the approval holder level. We have assumed a time requirement of 3 hours additional administration per approval for each of the 425 approvals.
53. At an hourly staff cost of £29.69, this results in total administration costs of **£37,855** in the first year following implementation.

Benefits

Unmonetised Benefits

54. The primary benefit is to reduce costs related to the production of non-safety critical aviation components. TCH and DOA holders will have the flexibility to choose if they wish to identify parts and appliances which would have a negligible effect on the safety of the operation of aircraft in the case of non-conformance with their design. If they should choose to do so, this would enable maintenance organisations to source components from a wider range of suppliers, without these suppliers requiring Part 21 approvals. The extent to which TCH and DOA holders will make use of this flexibility is unclear, as there would be a cost associated with doing so. However, as any action would be voluntary, we would only expect these businesses to undertake such action if they expected the benefits to outweigh the costs. Benefits might include an increase in sales due to the reduced cost of ownership for their customers. In any case the scope of the design review required would be kept to a minimum, limiting any potential costs to TCH and DOA holders. It has not been possible to quantify these costs and benefits.
55. It is possible that the removal of this red tape will lead to losses for some existing Production Organisation Approval holders, as they will be exposed to competition from firms who do not face the expense of acquiring Part 21 approval. While the CAA charges for this are relatively low (£3,693 for the primary site of activity of the approval seeker, and £3,693 per each additional site)¹³ as previously noted it is unlikely that firms producing generic items would seek such approvals for relatively low volumes of sales. Existing POAs themselves may choose to forego Part 21 approval and make associated savings, but this is deemed unlikely as they are likely to produce a range of safety critical items in addition to any products that may newly be defined as non-safety critical.
56. Any costs incurred in identifying non safety critical components are expected to be more than offset by reduced production costs and ongoing maintenance costs of aircraft, with a more competitive market for parts helping to ensure that cost reductions are passed on to maintenance organisations. While the net effect on the sector is definitively positive, as noted above there may be some losses for some existing POA holders. All of these impacts are dependent on TCH and DOA holders determining that identifying parts as non-safety critical would be beneficial, which remains uncertain.

C - Amendment to Part 21 to address ageing aircraft

¹³ ORS5 No. 387 CAA Scheme of Charges (Airworthiness, Noise Certification and Aircraft and Aircraft Engine Emissions)

57. We assume that businesses will face three types of cost as result of the implementation of this amendment: 1) training costs relating to implementation of the policy; 2) administration costs as a consequence of the need to update key documentation; and 3) ongoing costs associated with the additional work hours required to comply with the regulation.

Transition Costs

Staff training

58. The affected organisations will be required to provide training to their staff regarding the new legislation. This training would be incorporated as part of the pre-existing continuation training – a recurrent training required to take place annually across all aviation approvals. We have estimated that this would add 1 additional hour to the training syllabus for each of the 22,552 employees identified.

59. At an hourly staff cost of £29.69, this results in a **total training cost of £669,565** in the first year following implementation.

Administration costs

60. In addition to the training requirement for all employees, it is anticipated that there will be a one-off requirement to update internal procedures and organisations' Exposition/Handbook. This is expected to take place at the approval holder level. We have assumed a time requirement of 3 hours additional administration per approval.

61. At an hourly staff cost of £29.69, this results in total administration costs of £37,855 in the first year following implementation.

Ongoing Costs

Additional work hours costs

62. It is not expected that there will be significant additional impacts for TCHs as the additional requirements would already be expected on large aircraft designs. Most other authorities' requirements necessitate full-scale fatigue testing and fatigue tolerance analysis.

63. There is likely to be an impact for Supplemental Type Certificate (STC) Holders for large aircraft with a maximum capacity of 30 passengers or more.

64. Major STCHs would be expected to carry out additional assessments for repairs or changes affecting the fatigue critical baseline structure (FCBS) – the structure of an aircraft that is susceptible to fatigue cracking that could lead to catastrophic failure – of large aircraft. These assessments would include Damage Tolerance Evaluation (DTE) and Damage Tolerance Inspections (DTI) and would align UK regulations with current FAA, EASA and CS-25 requirements where damage tolerance requirements for repairs and changes up to the Limit of Validity (LoV), i.e. the intended lifespan of each aircraft, are already in place. Undertaking these assessments would impose an additional cost on major STCHs.

65. Through consultation with industry, it is estimated that this additional workload would add an additional 15% to the time for each relevant project. Based on current applications for significant repairs or changes, it is anticipated that there will be two such projects each year.

66. On average, each of these projects is anticipated to take 40 days and require two engineers per project. On the basis of a 7-hour workday, this leads to an additional 84 hours work per project and an **additional annual cost of £4,988**. Wages are assumed to be static throughout the appraisal period.

Benefits

Unmonetised Benefits

67. It has not been possible to quantify the benefits of the regulation, and the benefits have therefore not been monetised. The primary benefit is to reduce the risk of structural fatigue failure and improve the safety record of the aviation industry. The case studies outlined previously provide examples of incidents caused by structural fatigue failure, but it has not been possible (nor would it have been proportionate) to estimate a change in the rate of such incidents. The rate of safety incidents in the aviation sector is already very low, so any improvement is expected to be marginal.
68. A further potential benefit will be to incentivise proactive management of aircraft safety issues, potentially leading to cost savings related to avoided unscheduled maintenance or cost savings linked to the extension of an aeroplane's economic life.
69. The following further potential benefits of the regulation have been identified qualitatively:
- Provide a framework to proactively address ageing aircraft safety issues
 - Mandates the development and implementation of maintenance actions that might not otherwise be undertaken in a timely manner
 - Contribute to significantly reduce the downtime associated with the urgent unscheduled maintenance or Airworthiness Directives.
 - Allows for transparency and openness and may extend the economic life of the airplane.
 - Achieve harmonisation to a large extent with FAA and TCCA and compatibility with the relevant ICAO requirement, thereby improving access to overseas markets.

Business Impact Target Calculations

70. Utilising a Price Base Year of 2019 and a Present Value Base Year of 2020, the Do Something option has been estimated to have an Equivalent Annual Net Direct Cost to Business (EANDCB) of £0.21 million and a Business Impact Target (BIT) score of 1.0.

Sensitivity Analysis

71. Given the limited assessed impacts of the legislation, it has not been deemed proportionate to undertake sensitivity analysis.

Risks and unintended consequences

72. No significant risks or unintended consequences have been identified from this policy. It is expected that the regulation will be straightforward to enforce using existing CAA enforcement mechanisms.
73. A risk to the potential efficacy of the second proposed amendment has been identified. It is for Design Organisation Approval and Type Certificate Holders to decide if they will designate parts as non-safety critical, but the primary beneficiaries of such an act would be Maintenance Organisations and Continuing Airworthiness Management Organisations. DOA and TCH may therefore lack the full incentive to do so. While this would not lead to any negative impacts, it would mean the benefits of the policy would not be realised.

Wider impacts

Small and Micro Business Assessment

74. A number of small (those employing between 10 and 49 Full Time Equivalents (FTEs)) and micro (those employing between 1 and 9 FTEs) businesses will be impacted by the proposed amendments. As mentioned previously, 425 approval holders will be directly impacted the amendments. Of these organisations, 284 approval holders employ 49 or fewer employees, 132 are medium size businesses employing between 50 and 499 people, and 9 are large

businesses.¹⁴ However, these businesses will also benefit from some of the unmonetised benefits noted above.

A - Clarification of Instructions for Continued Airworthiness (ICA)

75. As the policy objective is to ensure ICAs are standardised across all approval holders it is not appropriate to exclude medium, small and micro businesses from the scope. The impacts on medium, small and micro businesses are in any case limited.
76. In the first year following implementation, it is expected that these approval holders will incur costs of £29.69 per employee relating to initial training provided to all employees. As such, costs are expected to scale linearly with the size of the business affected, and not unduly impact small, micro or medium sized businesses.
77. Further costs of £89.07 per firm are anticipated in relation to Exposition/Handbook updates. It is expected that each approval holder will face similar costs for this, which will therefore impose a disproportionate cost on small and micro businesses. However, this cost is a small proportion of the overall cost profile of the amendment and it is therefore assessed that the amendment overall will not unduly impact small and/or micro businesses.
78. The two Type Classification holders that will face ongoing costs to ensure updated ICAs are accessible to end users are both large businesses. Of the 62 remaining Design Organisation Approval holders that are also affected, 50 are small or micro businesses, and 12 are medium sized businesses. The cost incurred is however marginal and not disproportionate, at an annual total of £29.69 per firm. This compares to the higher cost of £237.52 for the Type Classification Holders.

B - Eligibility of parts to be used during maintenance (without a CAA Form 1)

79. The proposed amendment is deregulatory so it is appropriate for the measures apply to all firms. The firms expected to benefit most from direct reductions in costs are Maintenance Organisations (MOs) and Continuing Airworthiness Management Organisations (CAMOs). Of the 82 MOs, 70 are small or micro businesses and the remaining 12 are medium sized businesses, while 118 of the 150 CAMOs are also small or micro, with a further 30 medium sized businesses. As such, a considerable proportion of the benefits are expected to accrue to smaller businesses.
80. In the first year following implementation, it is expected that these approval holders will incur costs of £29.69 per employee relating to initial training provided to all employees. As such, costs are expected to scale linearly with the size of the business affected, and not unduly impact small, micro or medium sized businesses.
81. Further costs of £89.07 per firm are anticipated in relation to Exposition/Handbook updates. It is expected that each approval holder will face similar costs for this, which will therefore impose a disproportionate cost on small and micro businesses. However, this cost is a small proportion of the overall cost profile of the amendment and it is therefore assessed that the amendment overall will not unduly impact small and/or micro businesses.

C - Amendment to Part 21 to address ageing aircraft

82. In the first year following implementation, it is expected that these approval holders will incur costs of £29.69 per employee relating to initial training provided to all employees. As such, costs are expected to scale linearly with the size of the business affected, and not unduly impact small, micro or medium sized businesses.
83. Further costs of £89.07 per firm are anticipated in relation to Exposition/Handbook updates. It is expected that each approval holder will face similar costs for this, which will therefore impose a disproportionate cost on small and micro businesses. However, this cost is a small proportion of the overall cost profile of the amendment and it is therefore assessed that the amendment overall will not unduly impact small and/or micro businesses.

¹⁴ The data used has bandings of 1-10, 11-50, 51- 500 and 500+, which differs very slightly from the official definitions, but this is not expected to have any substantive impact.

Equalities Impact Assessment

84. An equalities impact assessment has not been completed as there will be no impact on those groups with a protected characteristic.

Justice Impact Test

85. A justice impact test has not been completed as no criminal offence is being introduced, and there will therefore be no impact on the justice system.

Trade Impact

86. The first and third proposed amendments are not expected to have any material impact on trade. The relaxation of restrictions on parts to be used during maintenance may allow for revision to certain bilateral agreements, for example to allow other release certificates ('as equivalent') for certain parts, if considered appropriate (international rules are more flexible than the current UK rule in this regard).

Competition Assessment

87. The first and third proposed amendments are not expected to have any material impact on competition. The relaxation of restrictions on parts to be used during maintenance is expected to enhance competition, as barriers to market entry will be reduced. This impact is dependent on Design Organisation Approval and Type Certificate Holders choosing to designate certain products as non-safety critical, which is not certain.

3.0 Post implementation review

1. **Review status:** Please classify with an 'x' and provide any explanations below.

<input type="checkbox"/>	Sunset clause	<input type="checkbox"/>	Other review clause	<input type="checkbox"/>	Political commitment	<input type="checkbox"/>	Other reason	<input checked="" type="checkbox"/>	No plan to review
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The regulations will not be specifically reviewed given their limited impact. However, the CAA continually monitor the UK's aviation safety regime as a whole to ensure it is effective and proportionate

2. **Expected review date** (month and year, xx/xx):

N/A

3. **Rationale for PIR approach:**

Rationale for not conducting a PIR:

The policy is estimated to have limited impacts on UK based businesses. While it has not been possible to monetise the benefits, it is thought that these will outweigh the costs of the policy. Therefore, we have determined that conducting a PIR would not be proportionate to the scale of the impact.