Exemption No. 11003

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98057-3356

In the matter of the petition of **Airbus** for temporary exemption from §§ 26.21 of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2013-0940**

TIME-LIMITED GRANT OF EXEMPTION

By letter L05ME1314128-V2, dated October 29, 2013, Mr. Yves Regis, Head of Product Integrity, Airbus SAS, D22 – Room 265, BP D2202, 1 rond-point Maurice Bellonte, 31707 Blagnac Cedex, France, petitioned the Federal Aviation Administration (FAA) for a temporary exemption from the requirements of Title 14, Code of Federal Regulations (14 CFR) 26.21. This exemption is requested for Airbus Model A380 passenger-carrying airplanes.

The petitioner requests relief from the compliance date of the following regulation:

> **Table 1 of § 26.21(c)(1)** – requires a compliance date of January 14, 2016 for Airbus to establish, for the Airbus Model A380 airplane, a limit of validity (LOV) of the engineering data that supports the structural maintenance program that corresponds to the period of time during which it is demonstrated that widespread fatigue damage (WFD) will not occur in the airplane. Airbus seeks a temporary exemption from the time limit described in 14 CFR 26.21 (c)(1), Table 1, as that time limit affects the Airbus Model A380 airplane. In lieu of complying with this date, Airbus requests to comply with § 26.21 (c)(2)(iii), and to provide the widespread fatigue damage evaluation results when the full-scale fatigue-damage analyses are completed. Airbus proposes a completion date no later than January 14, 2019.

The petitioner supports its request with the following:

This section quotes the relevant information from the petitioner's request, with minor edits for clarity. The complete petition is available in docket number FAA-2013-0940, located on the Internet at http://regulations.gov.

> **The extent of the sought relief and the reason for seeking this relief.**
>
> Airbus wants to comply with Section 14 CFR 26.21. The evidence is the submittal to FAA of the Airbus certification plan reference L51PL1101052v2. To satisfy the

requirements of 14 CFR §26.21 Airbus has to publish a Limit of Validity (LOV) associated with the necessary maintenance instructions by the 14th January 2016. Airbus reviewed again the rule and assessed that the compliance date for A380 should not be the 14th January 2016, but quote: "The date specified in the plan approved under§ 25.571 (b) for completion of the full-scale fatigue testing and demonstrating that widespread fatigue damage will not occur in the airplane structure." Unquote, as written in FAR [14 CFR] 26.21(c)(2)(iii).

Hence, the exemption which covers the compliance to 14 CFR 26.21 with revised compliance date is submitted to the FAA.

The reasons why granting the request would be in the public interest; that is, how it would benefit the public as a whole.

FAR 26.21 requests:

(c) Persons who must comply and compliance dates. The following persons must comply with the requirements of paragraph (b) of this section by the specified date.

(1) Holders of type certificates (TC) of airplane models identified in Table 1 of this section: No later than the applicable date identified in Table 1 of this section.

(2) Applicants for TCs, if the date of application was before January 14, 2011: No later than the latest of the following dates:

(i) January 14, 2016;

(ii) The date the certificate is issued;

or

(iii) The date specified in the plan approved under§ 25.571(b) for completion of the full-scale fatigue testing and demonstrating that widespread fatigue damage will not occur in the airplane structure.

The above requirements apply to the A380 aircraft. The paragraph (c)(1), through the "table 1" requires the A380 to be compliant 60 months after 14th January 2011, i.e. 14th January 2016.

It is the Airbus position that A380 aircraft should be compliant with the paragraph (c)(2)(iii) of the FAR 26.21 rule because the A380 programme, that is a post FAR 25 amendment 96 A/C [aircraft], would then be able to:

1. complete the full-scale fatigue test (that are going far beyond the 2 x DSG required by FAR 25.571 amdt 96),
2. complete the tear down of the full scale test specimen,
3. perform the micro-fractographic analysis of the damages found during the tear down exercise,
4. develop the appropriate Widespread Fatigue Damage maintenance tasks deriving from the full scale fatigue test analysis.

The additional testing, the tear down inspection of the airplane test specimen and the analysis of the damage are a benefit to the public because it allows Airbus to better define

the maintenance programme for addressing widespread fatigue damage. This will then enable operators to properly allocate resources for maintaining the A380 airplane. Airbus has scheduled to complete these full scale fatigue test activities by the 14th January 2019.

The target of the exemption is to postpone the 14th January 2016 compliance date quoted in (c)(1)[table 1] of FAR 26.21 until 14th January 2019 to comply with FAR 26.21(c)(2)(iii).

The approach that is proposed by Airbus for establishing an LOV for the A380 is consistent with the regulatory approach for airplanes pending type certificate approval and future airplanes. For those that were pending type certificate approval as of the rule effective date, section 26.21 specifies that design approval holders must comply no later than the latest of the following dates:

- January 14, 2016,
- the date the type certificate is issued,
- or the dated specified in the plan approved under section 25.571 for completion of the full scale fatigue testing and demonstrating that WFD will not occur in the airplane structure.

This compliance time requirement is similar for future airplanes.

As a summary, Airbus finds that granting this exemption is in the public interest because it allows Airbus to better define the maintenance programme for addressing widespread fatigue damage and this will enable operators to properly allocate resources for maintaining the A380 airplane.

The reasons why granting the exemption would not adversely affect safety.

A380 got its initial FAA Type Certificate on 12th December 2006. This A/C is certified post FAR amdt 96, which request the demonstration that widespread fatigue damage will not occur within the design service goal of the airplane. This has been demonstrated by test that has already been conducted sufficiently beyond two times the Design Service Goal of the A380. The lead A/C has not reached 20% of the Design Service Goal. It could then be easily extrapolated that the lead aircraft will be fully protected, by the initial certification as it will not reach 40% of the Design Service Goal by 14th January 2019.

Airbus considers that granting this temporary exemption will not adversely affect safety for the reason detailed above, i.e. the additional benefit coming from the Full Scale Fatigue Test analysis will improve the level of safety of the airplane.

Any additional information, views or arguments available to support the exemption request

A380 Operators will have to update their maintenance programme in only one step, beyond 2019, for Widespread Fatigue Damage service actions, taking full benefit of the test results. Complying in 2016 as required by the rule would have implied two steps in the maintenance programme revision, i.e. additional cost and complexity for all stakeholders- Manufacturer- airlines and the FAA.

The reason to exercise the privileges of the requested exemption outside the United States if needed

Airbus has no intent to exercise the privileges of the requested exemption outside the United States.

***Federal Register* publication**

A summary of the petition was published in the *Federal Register* on January 9, 2014 [79 FR 1666]. No comments were received.

The FAA's analysis

The FAA has considered the petitioner's request and finds that a grant of exemption is in the public interest for the reasons stated by the petitioner, and that the petitioner has shown how the exemption would not adversely affect safety.

This petition for exemption is consistent with the stated safety goals of Final Rule Docket No. FAA-2006-24281. Specifically, the intent of the final rule was to invoke the development of a limit of validity of the engineering data that supports the structural-maintenance program (hereafter referred to as LOV) that will ensure that large, transport-category airplanes will not be operated beyond a time at which widespread fatigue damage could occur. Section 26.21 of this final rule specifies that, for an LOV to be acceptable, the supporting evaluation must demonstrate that the fatigue characteristics of, and any specified maintenance actions for, the airplane are sufficient to prevent WFD from occurring before the LOV. Their petition for exemption is limited to a request for a 3-year extension to the compliance date for establishing the LOV (ref. § 26.21(c)(1)).

Under § 25.571, Amendment 25-96, applicants are required to develop full-scale fatigue-test evidence to demonstrate that WFD will not occur before an airplane reaches its design service goal (DSG). For new certification projects, the primary source of full-scale fatigue-test evidence is full-scale fatigue testing. Amendment 25-132 changed the term from DSG to LOV to express the point beyond which an airplane cannot be operated (unless an extended LOV has been approved). The FAA determined that the term "limit of validity" is more appropriate than the term "design service goal" in defining the point to which an airplane may be safely operated in relation to WFD. Just as the structural-fatigue characteristics of airplanes are understood only up to a point consistent with analyses performed, testing accomplished, and in-service experience gained, the engineering data, used in developing inspections and modifications to preclude WFD, is valid only to a certain point.

Accordingly, Airbus has conducted full-scale fatigue testing to demonstrate compliance that WFD will not occur before an airplane reaches its DSG. For compliance with § 25.571(b), Amendment 25-96, Airbus performed testing beyond two times DSG. Airbus later extended the full-scale fatigue-test program in an effort to establish an LOV, under § 26.21, to support operators' long-term operation and maintenance of the A380 airplanes. The successful completion of the full-scale fatigue test and analysis of the A380 airplane, beyond two times DSG, has demonstrated that WFD will not occur prior to the airplane's DSG. Based on the low utilization (total flight cycles) of the A380 airplanes, it can be assumed that the lead A380 airplane will not have reached 40% of the airplane's established DSG by January 14, 2019.

Therefore, granting Airbus's request to extend the compliance date for establishing the LOV from January 14, 2016, to January 14, 2019, will not have an adverse effect on safety.

Section 26.21 requires Airbus to establish an LOV of the engineering data that supports the structural-maintenance program that corresponds to the period of time during which it is demonstrated that widespread fatigue damage will not occur in the airplane. Airbus requested additional time to establish the LOV to complete an extended test program and subsequent detailed evaluation of the full-scale test specimen. This evaluation, which includes a tear-down and inspection of the test specimen, and a micro-fractographic analysis of the fatigue damage found during the tear-down exercise, will result in the development of WFD maintenance tasks that support the LOV. Completion of this evaluation, and development of WFD maintenance tasks, will require additional time beyond what was required to show compliance to § 25.571(b), Amendment 25-96. The FAA finds that Airbus's extended test-and-tear-down program is in the public interest as it will enable the development of an LOV that supports the long-term operation and maintenance of Airbus Model A380 airplanes.

In the absence of an approved LOV, the operator must incorporate the applicable LOV, specified in Table 1, of either § 121.1115 or § 129.115 should the operator want to fly the airplane. This provision eliminates any need for operators to obtain a separate approval for these "default" LOVs. The Airbus Model A380 airplane currently has an operational limitation included in its Airworthiness Limitations section. This LOV is based on one-half the number of cycles accumulated on the fatigue-test article.

The FAA's decision

In consideration of the foregoing, I find that a grant of a time-limited exemption to Airbus is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, Airbus is hereby granted a time-limited exemption from 14 CFR 26.21(c)(1), to extend the compliance date of January 14, 2016, to January 14, 2019, for Airbus Model A380 airplanes.

This exemption grants relief to the compliance time specified in § 26.21(c)(1), by granting a three year extension to Airbus for developing the LOV and the necessary maintenance tasks required to support the LOV. The granting of this exemption will not invalidate the operation of any future A380 airplane operating under part 121 or 129. Sections 121.1115 and 129.115 include requirements that explicitly define operators' obligations if an LOV is not available from the design-approval holder by the specified operator-compliance date.

Issued in Renton, Washington, on June 6, 2014.

/s/ Jeffrey E. Duven

Jeffrey E. Duven
Manager, Transport Airplane Directorate
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