

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

In the matter of the petition of

Hawker Beechcraft Corporation

for an exemption from § 25.981(a)(3),
Amendment 25-102, of Title 14, Code of
Federal Regulations

Regulatory Docket No. FAA-2006-25156

PARTIAL GRANT OF EXEMPTION

By letters dated February 10, 2009, March 17, 2009, and July 28, 2009, Mr. David Bernstorff, Vice President, Safety and Certification, for Hawker Beechcraft Corporation (HBC) (formerly Raytheon Aircraft Company), P.O. Box 85, Wichita, Kansas, 67201-0085, petitioned for a time-limited extension to its existing grant of exemption No. 8761B. That grant of exemption, issued June 26, 2009, provided an exemption until October 1, 2009, from the requirements of Title 14, Code of Federal Regulations (14 CFR) 25.981(a)(3), as amended by Amendment 25-102, for its Model 4000 series airplanes. Exemption No. 8761A also contained provisions that allowed airplanes to be delivered until March 1, 2009, without a complete showing of compliance with § 25.981(a)(3) and (b). That extension allowed HBC additional time to complete the necessary certification testing and documentation to show compliance with § 25.981(a)(3) and (b) for the fuel system components and with § 25.981(b) for the structural wing fasteners. The extension included a required airplane modification date of March 1, 2010. It also allowed HBC to complete its activities to support its request for a permanent exemption from § 25.981(a)(3) for the lightning protection of structural wing fasteners. As such, the proposed exemption, if granted, would also provide a permanent exemption from § 25.981(a)(3) for lightning protection of the structural wing fasteners, if certain conditions are met.

The petitioner requests relief from the following regulation:

**Section 25.981(a)(3) Fuel tank ignition prevention, as amended by
Amendment 25-102:**

(a) No ignition source may be present at each point in the fuel tank or fuel tank system where catastrophic failure could occur due to ignition of fuel or vapors. This must be shown by:

(3) Demonstrating that an ignition source could not result from each single failure, from each single failure in combination with each latent failure condition not shown to be extremely remote, and from all combinations of failures not shown to be extremely improbable. The effects of manufacturing variability, aging, wear, corrosion, and likely damage must be considered.

The petitioner supports its request with the following information:

This section quotes the relevant information from the petitioner's letters dated, February 10, 2009, and March 17, 2009, with minor edits for clarity. These letters, in addition to the previously submitted petitions for the original exemption (Exemption No. 8761) and the first amended exemption (Exemption No. 8761A), are available for review at the Department of Transportation's Docket Operations, or on the Internet at <http://regulations.gov>. The docket number is FAA-2006-25156.

Public Interest

The petitioner states the following in its petition for a time-limited extension to Exemption No. 8761A (reference petitioner's letter 940-2009-00716 dated February 10, 2009):

The extension to the exemption is needed to serve the public interest. Compliance with 14 CFR 25.981(a)(3) will require significant redesign and modification of the Model 4000 fuel system causing schedule impact. The main impact will be development of the GFI [ground fault interrupter]. The Model 4000 GFI development activity is planned to assure there is adequate time to qualify the unit for its environment, develop the GFI's pump electrical current monitoring function to both provide protection in the event of an arc and prevent nuisance trips of the pumps.

There is time in the schedule to characterize the normal current flows of the pumps and test the GFIs. There is also time per the requested changes to the provisions in the table below to incorporate any changes found to be needed during verification testing of the prototype GFIs. These activities are currently being coordinated with the supplier.

The extension to the exemption will allow several of the major corporations and around the US and the world to continue operating and receiving delivery of Hawker 4000 aircraft to meet their business needs.

The petitioner supplemented its position for public safety analysis with the following letter, reference 940-2009-01388, dated March 17, 2009:

The incorporation of an Arc Fault Protection Circuit into the Hawker Model 4000 will require the incorporation of new technology. There is no known supplier or OEM [original equipment manufacturer] capable of producing compliant arc fault protection circuitry to integrate into the Hawker Model

4000 fuel system. To date, HBC knows of only one US Supplier with experience in this technology who is willing to devote resources in the development of hardware for the Hawker Model 4000. Because of the unknowns inherent in the development of new technology, a schedule is somewhat unpredictable. However, the public will benefit as a whole after development, testing and production of the hardware is completed.

Except for the Arc Fault protection, all other aspects of the Hawker Model 4000 design are compliant with the requirements of 14 CFR 25.981(a)(3) and (b). With the recent addition of the Arc Fault Protection requirement, the retrofit planning could not start because of the uncertainty in arc fault protection design and availability. It has been HBC's intent to complete all necessary modification at one time rather than complete the modifications for the completed design and then the arc fault protection at a later time. It would be an excessive requirement on Hawker Beechcraft Corporation and our customers to require multiple aircraft modifications. Hawker Beechcraft plans to modify all airplanes in a factory approved service center. This plan supports the public interest by maintaining consistency of the inspections and modifications so any future activities benefit from the consistent manufacturing baseline.

The petitioner states the following in its petition for an extension to exemption 8761C (reference petitioner's letter 940-2009-06178 dated July 28, 2009):

The incorporation of a ground fault interrupter to provide arc fault protection for the Hawker Model 4000 will require the incorporation of new technology as noted in HBC letter reference 1. To date, HBC has identified only one supplier worldwide possessing experience in this technology and willing to devote resources in the development of hardware specific to the needs of the Hawker Model 4000. Selection of this supplier and our proposed schedule of Reference 1 was predicated on the fact the proposed solution was based on an FAA approved part, requiring only minor software changes (look up table values only, no code changes) to adapt to the Model 4000. In February 2009 HBC submitted a request for extension (Reference 1) for 14 CFR 25.981(a)(3) and (b) Amendment 102 to allow time to incorporate the GFI into the type design to provide arc fault protection of the AC fuel boost pumps.

In May 2009, prior to the FAA ruling on the extension request, a HBC Designated Engineering Representatives' SOI 1 Audit of its supplier's software lifecycle data revealed significant shortfalls in the previously approved software documentation presented to them. After discussions between HBC, the Wichita FAA-Aircraft Certification Office and FAA Transport Aircraft Directorate noted in Reference 2, the FAA granted HBC an extension of Amendment 102 compliance until October 1, 2009, while the FAA reviewed and investigated the audit findings shared by HBC. As a result of the SOI 1 audit associated delay, and in consideration of the efforts required to complete

the necessary software lifecycle documentation and follow on SOI I audits, HBC is requesting an extension from the original March 10, 2010, date in Reference 1 to a new date of March 10, 2012, to complete the component qualification and aircraft level certification.

The following reasoning provides HBC rationale for the two year' extension request. Four months will have elapsed between the discovery of the potentially insufficient software lifecycle documentation and the October 1 expected date for FAA communication of their investigation and audit findings. HBC has estimated 14 months for the supplier effort to fully document the software. This estimate is based on a similar experience with a supplier of complex electronic hardware. An additional six months is estimated for potential minor code modification that may be required due to issues identified during the documentation effort. These three elements combine to add 24 months to the existing extension request.

The March 10, 2012, completion date assumes the FAA provides guidance by October 1, 2009, and concurs that the software documentation is inadequate. If the FAA investigation, noted in reference 2, results in a reduced amount of time needed to complete the project. There is a risk that the supplier may not have the resources (people or capital) to complete the task once the full impact of the audit findings is understood. This proposed schedule and request for extension assumes an agreeable path can be developed. HBC desires to attain full Amendment 102 compliance as quickly as possible, and continues to incorporate aspects of Amendment 102 compliance into the production aircraft. Except for the arc fault protection for the AC fuel boost pumps, HBC believes the current Hawker Model 4000 type design is compliant with the requirements of 14 CFR 25.981(a)(3) and (b). Additionally, the current design has been reviewed with the Wichita ACO. It is our intent that by end of 2009, the Model 4000 production aircraft will have incorporated all required changes for Amendment 102 including wiring provisions for the arc fault detector (GFI assembly). The only element lacking at the end of the year will be the installation of the GFI assembly.

Effect on Safety

The petitioner states the following in regards to the effect on safety, reference letter 940-2009-00716 dated February 10, 2009).

HBC intends to implement the structural fastener aspects changes on the production line two aircraft serials earlier on the production line that was requested in the Reference 3 HBC Revised Petition for Exemption letter upon which Grant of Exemption was based. The letter shows the 39th aircraft will receive the modification kit on the line, whereas per the current status above the 37th and 38th will also be modified. The effect of this will be to increase safety based on any benefits to the additional two aircraft receiving this

modification prior to delivery rather than through retrofit as was originally anticipated.

Due to the economy, HBC will deliver fewer Model 4000 airplanes than was expected under the original exemption issued on August 7, 2006. While this extension will allow continued delivery of airplanes until March 10, 2010, without a full showing of compliance, the additional 1 year extension would not result in significantly more airplanes being delivered than what was anticipated under the original exemption.

Additionally, the Model 4000 has only wing tanks with no center tank. The benefit is the tank flammability exposure is very low. Analysis completed during initial certification demonstrates that low flammability has been quantitatively substantiated to support compliance with Amendment 102 of 14 CFR 25.981(c). This provides additional protection against the effects of arcing.

Therefore there is little additional safety risk in allowing continued airplane deliveries until March 10, 2010, and allowing additional time for modification of aircraft. HBC recommends the modification deadline be made to coincide with the first major scheduled down time at 3,000 hours 5 years, whichever comes first.

In the letter submitted on July 28, 2009, HBC modified the above dates and requested new dates listed below under request changes provision of reference 1.

The HBC status in working through the provisions listed on pages 9 and 10 of Reference 1 is as follows:

Reference 1 Provision Number	Status	Rationale for Extension Request
1.	HBC requests additional extension	HBC requests the date of the provision be changed to March 10, 2010 . This will allow HBC to complete the development and qualification extension testing, installation and certification of the GFI.
2.	HBC requests additional extension	HBC requests the date of the provision be changed to March 10, 2010 . This will allow HBC to incorporate the service information identified as extension necessary in the final approved Safety Analyses, into the appropriate manuals.
3.a.	completed	Data already submitted under the Reference 4, Certification Plan Fuel Tank Safety FAA Project TD4732WI-T completes the showing that the structural wing fastener design includes two independent and effective layers of protection from the effects of lightning. HBC intends to incorporate the changes to the wing when the ACO concurs with the wing skin fastener aspects of the project are complete.
3.b.	completed	Data submitted per the Project TCI258WI- T, Original Type Certification

		of the Hawker Beechcraft Model 4000 (Reference 5) is FAA approved. The project included findings the fuel tanks exhibit low fuel vapor flammability per the requirements of 14 CFR 25.981 Amendment 102.
4.	completed	(Compliance Plan required for provisions 1, 2 and 3) - completed per the Reference 6 Certification Plan. The Certification Plan will be updated to include the GFI incorporation and resubmitted to the ACO. (Drafts of data required for provisions 1, 2 and 3) - completed per the Reference 7 letter to the ACO. Development of the data supporting incorporation of the GFI will be coordinated with the ACO.
5.	HBC requests additional extension	HBC requests the FAA extend the exemption to allow the "Airworthiness Limitation" section to be updated to state that airplanes produced cannot be operated after the 3,000 hours, or 5 years maintenance interval, which ever comes first, unless the design changes submitted in accordance with provisions 2 and 3 (above) are incorporated by the owner/ operator. This will allow aircraft to be operated until HBC has had an agreed upon period following the completion of the production change's FAA approval to incorporate the changes into operational aircraft. It is planned to maximize the quality of the retrofit effort through use as much as practical using a single team to upgrade the aircraft. The quality will be maximized through the experience the team receives in accomplishing the task on multiple aircraft. It is planned for aircraft delivered after November 2009 to be provisioned on the production line so the most recently fielded aircraft, those delivered after the block of 36 mentioned above can be made compliant through simple installation and electrical connection of the GFI Assembly and return to service testing. Furthermore, due to market pressures, HBC will endeavor to complete the design, facilitate its certification and incorporate changes before delivery as much as is practical to decrease burden on customers and the cost to HBC of retrofitting the subject changes. Currently HBC is validating the retrofit and Production installation of the improved wire routing near the wings; and has already completed validation of the structural fastener installation. The number of hours required to upgrade the wiring near the tanks is significant. Reference the status list above in the main text of the letter for a listing of other significant accomplishments that shows HBC is working to develop engineering, and deliver retrofit compliant aircraft in a timely manner.
6.	HBC requests additional extension	HBC requests the FAA change the provision to state: the "Airworthiness Limitations" section for those aircraft delivered under the original exemption may be revised to reflect the limitations in provision 5 of this table. This will allow HBC time to update "Airworthiness Limitations" sections as required provision 2 of this table.
7.	HBC requests additional extension	HBC requests the FAA change the provision to state: Unless the FAA approves the data and service information required by provisions 1, 2 and 3 (above) by July 10, 2010 , changes to the HBC 4000 Type Certificate will no longer be worked by the FAA in parallel with the change incorporating the completion of the terms of this exemption. The only exception to this being the FAA will work with HBC in parallel to this 14 CFR 25.981 Amendment 102 change to approve any safety of flight

		changes deemed necessary by the FAA, including review of HBC notifications, required by 14 CFR 21.3, to the FAA of the need for safety of flight changes. This provides further assurance HBC will diligently work toward FAA approval of the data and service information required by provision 1, 2 and 3 (above)
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Request changes by letter submitted on July 28, 2009

Table of request changes to the provision of reference 1

Reference 1 provision	Extension date (or operational duration) Requested in reference 1	Resultant Extension date due to 2 year extension request
1. design data submitted for FAA approval	March 10, 2010	January 10, 2012
2. ICA information submitted for FAA approval	March 10, 2010	January 10, 2012
3. completed	NA (completed)	NA (completed)
4. completed	NA (completed)	NA (completed)
5. modify delivered aircraft	3000 hours or 5 years	5400 hours or 7 years*
6. provide ICA infor for fielded that are to be bought into compliance with amd 102	3000 hours or 5 years	5400 hours or 7 years*
7. Date compliance must be found by FAA to allow HBC to continue to issue airworthiness approvals	July 10, 2010	March 10, 2012

* estimated usage is 1200 hours per year

The petitioner supplemented its position to the effect on safety by letter 940-2009-01388, dated March 17, 2009:

The request for an extension to Exemption 8761A poses no additional risk to safety from the original petition based on the following:

At the time original petition for exemption was granted, it was envisioned that HBC would have delivered 100 aircraft that would require some level of modification to bring the aircraft into conformance to the final type design. As the affects of the worlds economy continue to unfold, it is HBC's projection that only 51 aircraft will be delivered that are not fully compliant.

As the means of compliance evolved and became clearer, so did the task of retrofit. Modifications to the aircraft can be characterized in several groups, namely:

- Intrinsically safe fuel tank wires – These are the wires that penetrate the fuel tank and require separation and protection in red convoluted tubing,

- Lightning strike fasteners – This involves replacing approximately 200 fasteners on the inboard wing and the application of a additional doubler to the outboard two feet of wing skins,
- Wires near the tank and incorporation of an arc fault protection. – This involves relocating wire harnesses along the rear spar, and
- Applying additional dielectric barriers to the spar.

When the first extension was requested the known tasks were isolated to modification to the intrinsically safe wires and replacement of the fuel cards. Because HBC had been working these issues and had already been provisioning aircraft, the scope of retrofit was limited. With the recent determination of the wing modifications (rivets, doublers, dielectric barrier) and requirement for the arc fault protection, the scope of modification became more extensive and the time required to modify each aircraft grew as well. It is now envisioned that each aircraft will require approximately 25 manufacturing days to complete the requisite modification and return to service testing.

Because of the nature of the rework and because of important continued airworthiness aspects of the rule, HBC believes that consistency and quality of the rework is an important aspect of compliance. To that end the rework to fielded aircraft will be performed at a factory authorized service center.

Without considering the logistics of scheduling customers throughout the world, the minimum time to retrofit the fleet of 51 aircraft would be 43 months or 3.6 years. Allowing time for scheduling, HBC realistically established the time to retrofit the fleet at 5 years. The basis for this time frame follows:

The modification on 36 delivered unmodified aircraft for the wing, wiring and dielectric paint is estimated to require 34 calendar days per aircraft. This includes 27 working days, some work done in parallel, and 24 serial working days through maximizing parallel task(s).

These tasks consist of:

- Receiving inspection, make safe (2 days)
- Wing Modification (12 days)
- GFI and associated wiring (1 day)
- Fuel Card (1 day)
- Dielectric paint (7 days)
- Reassemble accessed areas (3 days)
- Return to service flight (1 day)

For 15 delivered aircraft only requiring the GFI, wiring and fuel card, the modification is estimated to require 7 calendar days per aircraft. This includes

8 working days, some work done in parallel, and 5 serial working days through maximizing parallel task(s).

These tasks consist of:

- Receiving inspection, make safe (2 days)
- GFI and associated wiring (1 day)
- Fuel Card (1 day)
- Reassemble accessed areas (3 days)
- Return to service flight (1 day)

Impact on safety based on expected flight hours:

The flight hours expected to be accumulated in the pre-Amendment 102 configuration per this extension request are less than the original exemption as explained below.

1. (Original) Partial Grant of Exemption, No. 8761A from 14 CFR 25.981(a)(3)(b) docket number FAA-2006-25156 – It is estimated that there would be 126,000 flight hours by the fleet. Refer to calculation 1 on the subsequent page for details.
2. Requested extension for Exemption, letter to the FAA 940.2008-03571, Revised Petition for Exemption, dated July 3, 2008. It is estimated that there would be 114,000 flight hours by the fleet. Refer to calculation 2 on the subsequent page for details.

Expected time in the Pre Amendment 102 Configuration:

Per the requested extension (reference 2 above) aircraft will operate in the pre-amendment 102 configuration in a range from a few days to 5 years, with an average of about 2 years.

Conclusions

As stated in the Partial Grant of Exemption (Reference 1), the aircraft are relatively new compared to a mature fleet, the public interest and safety are not significantly affected by the additional time required to develop a compliant design and modify aircraft. Additionally, utilizing a single modification team to modify aircraft to HBC's standards will provide an additional benefit to safety through consistency of work performed

Calculations

General Assumptions:

1. The utilization estimate for the 10% of the fleet planned for delivery for US fractional jet usage is 1,200 flight hours per year.
2. The utilization estimate for the 12% of the fleet planned for delivery for International fractional jet usage is 1,000 flight hours per year.

3. Conventional owner (non-fractional) jet usage is estimated to be 600 flight hours per year.
4. This yields a weighted average utilization rate of 840 flight hours per year.

Calculation 1: Original Partial Grant of Exemption (Reference 1)

Additional Assumptions:

- Aircraft delivery rate projected at the time to be 50 per year from August 12, 2006 through September 1, 2008
- Modifications to all pre-amendment 102 aircraft occur from September 1, 2008 through October 1, 2009

Calculations:

50 aircraft per year x 2 years of production = 100 aircraft operating for some duration in the pre amendment 102 configuration.

During the 2 years of production on the average, ½ of the fleet will be delivered and operational. 100 aircraft fleet x ½ of the fleet on the average have been delivered * 840 flight hours per aircraft on the average per year x 2 years = 84,000 operating hours.

During the year of modification ½ of the fleet will be operating in the pre-amendment 102 configuration, so with a 100 aircraft fleet x ½ of the fleet on the average operating in the unmodified (pre-amendment 102 configuration) x 840 flight hours per aircraft on the average per year *1 year = 42,000 operating hours.

$$84,000 + 42,000 = 126,000$$

Conclusion:

Under the original grant of exemption 126,000 fleet hours would have been expected to accumulate in the Pre Amendment 102 Configuration.

Calculation 2: Requested Extension of Exemption (Reference 2)

Assumption:

- HBC estimates it will deliver a total of 51 Model 4000 aircraft by July 10, 2010. Of those 51 aircraft, 36 will require significant modification and 15 will require less significant modification.

Calculations:

Hours Accumulated in the First 36 Aircraft Delivered

For the purpose of this calculation, it will be conservatively estimated the aircraft will accumulate 3,000 flight hours (3,000/840 avg. flight hrs. = 3.7 years of operation) each for a total of 108,000 hours.

Hours accumulated by the last 15 aircraft delivered in the pre-Amendment 102 configuration

These aircraft will only require Fuel Quantity Processor card replacement, GFI installation and the associated return to service functional tests.

It is planned the last 15 aircraft to be delivered in the pre-amendment 102 configuration will be upgraded during their first year of operation; so half of these aircraft will be in the pre-amendment 102 configuration during that year. This would result in 6,300 flight hours (15 x ½ x 840) of operation.

$$108,000 + 6,300 = 114,000$$

In summary, HBC requests an extension be made to Exemption No. 8761A through the suggested following revisions of the provisions:

1. HBC will complete the fuel system safety analysis and documentation to show compliance to 14 CFR 25.981(a)(3) and 14 CFR 25.981(b), as amended by Amendment 25-102, prior to March 10, 2010, for all fuel system components except compliance to 14 CFR 25.981(a)(3) for structural wings.
2. Before March 10, 2010, HBC will develop and submit for FAA approval, service information to incorporate any design changes and/or operation and maintenance limitations developed to meet the provision of 14 CFR 25.981(a)(3) and (b), as identified in provision 1 (above).
3. Before March 1, 2009, HBC will develop and submit for FAA approval, data and service information to incorporate any design changes and/or operating and maintenance limitations that have been shown to meet the following:
 - a. The structural wing fastener design includes two independent and effective layers of protection from the effects of lightning, and FAA completes the showing that the structural wing fastener design includes two independent and effective layers of protection from the effects of lightning.
Completed - Data already submitted for FAA Project TD4732WI-T, Fuel Tank Safety Mode14000
 - b. The fuel tanks exhibit low fuel vapor flammability characteristics.
Completed - Data submitted per the Project TC1258WI-T, Original Type Certification of the Hawker Beechcraft Model 4000 is FAA approved. The project included finding the fuel tanks exhibit low fuel vapor flammability per the requirements of 14 CFR 25.981 Amendment 102.
4. HBC must develop a comprehensive compliance plan and schedule, supporting the deliverables outlined in conditions 1, 2 and 3 (above), to be presented to the FAA within 60 days after the granting of this exemption.

HBC must also submit drafts of the data and service information required by conditions 1, 2, and 3 (above) to the FAA by January 1, 2009.

Completed - The Reference 6 Certification Plan was sufficient at the time of its submittal. However, with the incorporation of the GFI, a design review with the Wichita ACO will be added to the Certification Plan to provide the ACO with a comprehensive plan schedule, and a review of the draft data and service information required by provisions 1, 2 and 3. A schedule will be included in the Certification Plan.

5. The "Airworthiness Limitation" section of the Model 4000 "Instructions for Continued Airworthiness" will state that airplanes produced cannot be operated after the 3,000 hour, 5 year interval unless the design changes submitted in accordance with conditions 2 and 3 above are incorporated by the owner or operator.

6. The "Airworthiness Limitation" section for those airplanes delivered under the original exemption may be revised to reflect the limitation condition 5 (above).

7. Unless the FAA approves the data and service information required by conditions 1, 2 and 3 (above), by July 10, 2010, changes to the HBC 4000 Type Certificate will no longer be worked by the FAA in parallel with the change incorporating the completion of the terms of this exemption. The exception to this being the FAA will work with HBC in parallel with incorporating the completion of the terms of this exemption to approve any safety of flight changes deemed necessary by the FAA, including review of HBC notifications, required by 14 CFR 21.3, to the FAA of the need for safety of flight changes.

Federal Register publication

A summary of HBC's February 10, 2009, petition was published in the Federal Register on March 17, 2009 (FR 74 15047). No comments were received.

The FAA's analysis

The FAA has reviewed the information provided by HBC and acknowledges that incorporating ground fault interrupter (GFI) into Hawker Beechcraft Model 4000 series airplane fuel system should support compliance by preventing single failures inside the fuel pump and its associated circuitry from occurring. The integration of GFI in the fuel system is installation specific and universal GFI devices are not available for such use. This requires HBC to develop the pump profile configuration and its associated software to properly integrate the two into a functional unit specific to the Hawker Beechcraft Model 4000 series airplane design.

The FAA recognizes that HBC needs time to work with its supplier(s) to develop the new design with GFI and to demonstrate compliance. However, the FAA is not in agreement with the reasoning provided by HBC for the two-year extension to the current exemption request. This requested extension, if granted, would extend the date to complete the design and show that it is compliant with § 25.981 to March 12, 2012, excluding lightning protection of fuel tanks. HBC states that they were unable to acquire data at their supplier from previous certification projects which they were relying on to complete their project. We acknowledge that using previously approved data can serve to expedite the certification effort. However, we have reviewed other projects incorporating similar GFI components to determine the range of time required from project application to type design approval. The timeframes ranged from 8 months, when previously approved data was used, to 24 months when all new data had to be generated to obtain a supplemental type certificate. Although HBC may be able to benefit from previously approved data to simplify their certification effort, the FAA establishes 24 months, from the time HBC agreed to install GFI through issue paper process, to submit their type design data for approval (i.e., January 23, 2009), plus 90 days to address unforeseen design and substantiation challenges, or April 25, 2011.

HBC also proposes to incorporate GFI modifications in its factory-approved service center. While we acknowledge that there can be benefits from such an approach, we also recognize that there can be drawbacks, such as limited resources to accomplish the work. Enabling and utilizing all suitable and available facilities to accomplish this work will enable the work to be accomplished in less time without compromising quality.

We partially agree with the proposed compliance time for incorporating the GFIs into the fleet. HBC has requested seven years to incorporate the GFIs in the fleet of approximately 51 aircraft based on a risk analysis. However, HBC's estimate of 50 airplane deliveries per year noted in their calculation 1 and 2 does not represent actual delivered rates. Given the actual number of airplanes delivered to date is less than 13, the FAA cannot justify granting seven years compliance time. Part of this analysis was based on HBC's proposal that they would incorporate the GFIs into the affected airplanes directly at HBC facilities. On other airplanes, we have mandated installation of GFIs in order to prevent an electrical fault in the fuel pump system, which might cause ignition of flammable vapor inside the pump and/or tank. We defined compliance times of 36 months for a fleet of 24 airplanes and 60 months for a fleet of 199 airplanes. However, we note that HBC has shown that their fuel tanks are low flammability tanks. Based on the data provided by HBC and on the related assessments noted here, we have determined that a compliance time of 36 months from the type design approval, or March 24, 2014, is appropriate for making the necessary modifications to the fleet of Model 4000 series airplanes.

Although HBC proposes that they have successfully completed the provision to develop a comprehensive compliance plan and schedule, the petition for extension shows that a new plan and improved monitoring of the performance is necessary. For this reason, we are updating the provision to develop a new plan and to monitor and regularly report adherence to the plan.

HBC proposes to change the provision that would void Type Certificate T00013WI in the event HBC fails to meet the provisions of the exemption to a provision limiting design changes that may be made to the airplane. The proposal would not only affect HBC, but would impose unexpected consequences on operators and airplane modifiers because of the deviations from standard FAA design change and alteration procedures. Therefore, we have not included the proposed change in the provisions of this exemption. However, the FAA has determined that the provision that would void Type Certificate T00013WI represents too high a penalty to owners and operators of the airplane. If enacted, the provision would not only ground the fleet of airplanes, but would also require a comprehensive recertification program. Instead, the FAA has determined that prohibiting delivery of Hawker Beechcraft Model 4000 series airplanes after May 25, 2011, is more appropriate in the event HBC has not shown full compliance through the data submitted on April 25, 2011, and the FAA has not found full compliance with the provisions of this exemption by May 25, 2011.

Effect on Safety:

The FAA has reviewed the information provided by HBC and concluded that, with the addition of GFI and exemption from fuel tank structural lightning protection, all other aspects of the Hawker Beechcraft Model 4000 series design are compliant with the requirements of § 25.981(a) and (b). The FAA has determined that there is little additional risk in extending this exemption to March 24, 2014. HBC intends to implement the structural fastener changes on the production line to two additional airplanes. The effect is increased safety based on the benefit received by this modification. Due to the economic downturn, HBC will deliver fewer Hawker Beechcraft Model 4000 series airplanes than was expected when the original Exemption No. 8761 was issued on August 7, 2006. While this extension will allow continued delivery of airplanes until May 25, 2011, without a full showing of compliance, HBC will most likely deliver fewer airplanes than had been anticipated under the original exemption.

Additionally, the Hawker Beechcraft Model 4000 series airplane only has wing tanks. It does not have a center tank. The safety benefit is that the tank flammability exposure is very low. The analysis completed during initial certification demonstrates that low flammability has been quantitatively substantiated to support compliance with 14 CFR 25.981(c), Amendment 25-102. This provides additional protection against the effects of arcing.

Therefore, there is little additional safety risk in allowing continued airplane deliveries until May 25, 2011, and in allowing airplanes delivered on or before May 25, 2011, to be operated as long as March 24, 2014, without incorporating these design changes.

The FAA's decision

In consideration of the foregoing, I find that grant of a time-limited extension to this exemption 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, Hawker Beechcraft Corporation (HBC) is hereby granted an extension until March 24, 2014, from the requirements of § 25.981(a)(3) and (b) as they pertain to the fuel system, and a permanent

exemption to § 25.981(a)(3) pertaining to the effects of lightning on structural wing fasteners for the Hawker Beechcraft Model 4000 series airplanes with the following provisions:

Note: Provisions 3(a), 3(b), and 4 have been completed. They are included as a reference to show progress since Exemption No. 8761A was issued.

1. HBC will complete the fuel system safety analysis and documentation to show compliance to § 25.981(a)(3) and (b), as amended by Amendment 25-102, prior to April 25, 2011, for all fuel system components except compliance to § 25.981(a)(3) for structural wing fasteners.
2. Before April 25, 2011, HBC will develop and submit for FAA approval service information to incorporate any design changes and/or operating and maintenance limitations developed to meet the provision of § 25.981(a)(3) and (b), as identified in provision 1 (above).
3. Before March 1, 2009, HBC will develop and submit for FAA approval, data, and service information to incorporate any design changes and/or operating and maintenance limitations that have been shown to meet the following:
 - a. The structural wing fastener design includes two independent and effective layers of protection from the effects of lightning, and
 - b. The fuel tanks exhibit low fuel vapor flammability characteristics.
4. HBC must develop a comprehensive compliance plan and schedule, supporting the deliverables outlined in conditions 1, 2 and 3 (above), to be presented to the FAA Wichita Aircraft Certification Office by December 1, 2009. Therefore, HBC must submit a monthly status report to the FAA Wichita Aircraft Certification Office identifying all actions completed to date as well as those that remain outstanding. The report must demonstrate HBC's progressive performance and accomplishments indicating their projected success in meeting the schedule and conditions of the exemption. HBC must also submit drafts of the data and service information required by conditions 1, 2 and 3 (above) to the FAA by March 1, 2011.
5. For Model 4000 airplanes granted a certificate of airworthiness on or after the date of Exemption No. 8761C and on or before May 25, 2011, the "Airworthiness Limitation" section of the Model 4000 airplane "Instructions for Continued Airworthiness" will state that airplanes produced cannot be operated after March 24, 2014, unless the design changes submitted in accordance with conditions 2 and 3 (above) are incorporated by the owner or operator.
6. The "Airworthiness Limitation" section for those airplanes delivered under the original exemption, or Exemption No. 8761A, or Exemption No. 8761B, may be revised to reflect the limitations in condition 5 (above).

7. Airplanes for which application for airworthiness certificate is made after May 25, 2011, must incorporate ground fault interrupters to protect electrically-driven fuel pumps in compliance with § 25.981(a)(3).

8. The FAA will not issue original airworthiness approvals for Hawker Beechcraft Model 4000 airplanes after May 25, 2011, unless HBC has shown full compliance with the provisions of this exemption by that date.

This amendment is part of, and will remain attached to, Exemption No. 8761.

Issued in Renton, Washington, on September 30, 2009.

/s/

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service