

August 29, 2000 First issue (KU-KI-133)
June 30, 2011 Amended (KOKU-KU-KI-282)

Circular

Director, Airworthiness Division
Aviation Safety Department
Civil Aviation Bureau
Ministry of Land, Infrastructure, Transport and Tourism

Subject: Managing large-scale structural repair conducted outside of Manufacturer's facility

The notice issued by the Director General of the Civil Aviation Bureau is directed to seven (7) air carriers, the approved maintenance organizations and the approved production organizations as KU-KEN-989 dated July 24, 1987 relating to the recommendation (the recommendation No.1 item 1) of the Aircraft Accident Investigation Commission (AAIC, currently Japan Transport Safety Board). However, other organizations that perform the air transport service using category T aircraft must be requested to follow this circular to implement an appropriate action.

Supplementary Provisions

1. This circular shall be enforced on August 29, 2000.
1. TCL-137-87 shall be abolished by this circular.

Supplementary Provision (June 30, 2011)

1. This circular shall be enforced on July 1, 2011.

Please contact for questions and comments regarding this Circular to:

Airworthiness Engineer, Airworthiness Division, Aviation Safety and Security
Department,
Civil Aviation Bureau, Ministry of Land, Infrastructure, Transport and Tourism
2-1-3 Kasumigaseki, Chiyoda-ku, Tokyo, 100-8918, Japan
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Attachment 1
KU-KEN-989

July 24, 1987

Attention: The President, seven Japanese scheduled air carriers

Director-General, Civil Aviation Bureau

Maintaining airworthiness for aircraft after implementation of large scale repair

The investigation report for aircraft accident of Japan Air Lines, Boeing 747SR-100, JA8119 on August 12, 1985 was publicized by the Aircraft Accident Investigation Commission recently with submittal of recommendations as attached herewith.

In order to take the intention of the recommendation and apply the lessons learned of this accident to further aviation safety enforcement, the Civil Aviation Bureau specified, as shown below, the corrective action regarding a management system on a large-scale repair, including alteration on the aircraft primary structure, accomplished at locations other than the production facility of that aircraft and a means of a special inspection following a large-scale repair. The Civil Aviation Bureau requests addressees the sufficient awareness of this circular and efforts to prevent a recurrence of a similar accident.

Managing large-scale structural repair conducted outside of Manufacturer's facility

When a large-scale structure repair with changes in the aircraft primary structure upon recovery and repair for structural damage by an aircraft accident is accomplished at other than the manufacturing facility, those specified in the Maintenance Manual and the followings must be paid attention because it is necessary to perform the repair carefully in consideration to the work characteristics and environment:

(1) Understanding of the structural damage condition

Inspection scope must be evaluated to collect information for the structural damage condition.

In evaluating the inspection scope technically, actions to obtain assistance by the aircraft manufacturer must be considered as necessary.

(2) Establishing a basic policy of the repair

A. Evaluation of the level of repair difficulty

The level of repair difficulty must be evaluated technically whether the damaged area, thus requiring the repair, can be restored to airworthy condition as previous.

B. Evaluation of a scheme (or structure) of the repair implementation

A scheme of the repair work implementation must be evaluated including the selection of an appropriate repair site, considerations whether the repair can be accomplished internally, or whether a support from the manufacturer of the aircraft is necessary.

C. Evaluation of the repair scope and method

Repair scope and method of the damaged area must be evaluated with a support from the manufacturer of the aircraft as necessary so that the structure can maintain the fail safe concept.

(3) Scheme of the repair work

A. Secure of working personnel

The required personnel who can handle the repair work must be secured for the large-scale repair and also provide them as necessary with supervisory for familiarization with the work because the large-scale repair work including changes in primary structure requires expertise and skills regarding the structure.

B. Actions when special equipment or tools are required

When special equipment or tools are required to ensure the required accuracy, procedures for the work implementation must be evaluated with obtaining technical assistance from the aircraft manufacturer as necessary, to ensure the secure and stable implementation of the work.

(4) Scheme of the inspection of the repair work

A. Secure of inspection personnel

The required inspection personnel for the large-scale repair who can handle inspections must be secured and also provide them as necessary with technical supervisory on the inspection work because the large-scale repair works including changes in primary structure requires expertise and skills regarding the structure.

B. Establishment of inspection processes and procedures

On the large-scale repair processes and repair works where a discrepancy could likely occurs, the special inspection processes with a support from engineering organization must be established so that each process is checked for the proper work by the inspection properly.

In addition, the inspection items and procedures required for the final confirmation of safety to release must be established, too.

C. The inter-process inspection must be established as necessary for the work where the non-conformity cannot be found after completion of the work.

(5) Actions required when the repair is contracted

A. Establishment of the management system of the repair work by the contracted organization

The contracted organization must be supervised so that it can take actions for the system to

secure the safety as specified in paragraphs (1) through (4).

B. Audit of the contracted organization

An audit must be conducted on the quality assurance system of the contracted organization prior to the commencement of the repair to ensure the quality assurance capability and the quality assurance system unless the periodical audit is implemented.

C. Receiving inspection scheme (system)

The receiving inspection scheme must be established depending upon the quality assurance capability of the contracted organization and the degree of the repair work, and the inspection personnel of the contractor must witness the critical inspection process and the final inspection generally considering that the contracted work is unusual and specialized, in principal.

In addition, the contracted organization must be mandated to report a significant discrepancy occurred during the repair to an inspection personnel of the contractor according to the contract so that the contractor can be notified them in the timely manner, and be enabled to implement the review on corrective actions and an on-site inspection upon the completion of the related works.

(6) Miscellaneous

- A. A large-scale alteration with changes in the aircraft primary structure also requires the similar work management in accordance with this circular.
- B. A review on the proper management system suitable to your organization in consideration to items prescribed in this circular must be pursued, and, as appropriate, it must be prescribed in the MAINTENANCE MANUAL.

Attachment 2

KU-KEN-989

July 24, 1987

Attention; The president, major approved maintenance organizations

Director-General, Civil Aviation Bureau

Maintaining airworthiness for aircraft after implementation of large scale repair

The investigation report for aircraft accident of Japan Air Lines, Boeing 747SR-100, JA8119 on August 12, 1985 was publicized by the Aircraft Accident Investigation Commission recently with submittal of recommendations as attached herewith.

In order to take the intention of the recommendation and apply the lessons learned of this accident to further aviation safety enforcement, the Civil Aviation Bureau specified, as shown below, the corrective action regarding a management system on a large-scale repair, including alteration on the aircraft primary structure, accomplished at locations other than the production facility of that aircraft and a means of a special inspection following the major repair. The Civil Aviation Bureau requests addressees the sufficient awareness of this circular and efforts to prevent a recurrence of a similar accident.

Managing large-scale structural repair conducted outside of manufacturer's facility

When a large-scale structure repair with changes in the aircraft primary structure upon recovery and repair for structural damage by an aircraft accident is accomplished at other than the Manufacturing facility, those specified in the Approved maintenance and alternation exposition and the followings must be paid attention because it is necessary to perform the repair carefully in consideration to the work characteristics and environment:

(1) Understanding of the structural damage condition

Inspection scope must be evaluated to collect information for the structural damage condition.

In evaluating the inspection scope technically, actions to obtain assistance by the aircraft manufacturer must be considered as necessary.

(2) Establishing a basic policy of the repair

A. Evaluation of the level of repair difficulty

The level of repair difficulty must be evaluated technically whether the damaged area, thus requiring the repair, can be restored to airworthy condition as previous.

B. Evaluation of a scheme (or structure) of the repair implementation

A scheme of the repair work implementation must be evaluated including the selection of an appropriate repair site, considerations whether the repair can be accomplished internally, or whether a support from the manufacturer of the aircraft is necessary.

C. Evaluation of the repair scope and method

Repair scope and method of the damaged area must be evaluated with a support from the manufacturer of the aircraft as necessary so that the structure can maintain the fail safe concept.

(3) Scheme of the repair work

A. Secure of working personnel

The required personnel who can handle the repair work must be secured for the large-scale repair and also provide them as necessary with supervisory for familiarization with the work because the large-scale repair work including changes in primary structure requires expertise and skills regarding the structure.

B. Actions when special equipment or tools are required

When special equipment or tools are required to ensure the required accuracy, procedures for the work implementation must be evaluated with obtaining technical assistance from the aircraft manufacturer as necessary, to ensure the secure and stable Implementation of the work.

(4) Scheme of the inspection of the repair work

A. Secure of inspection personnel

The required inspection personnel for the large-scale repair who can handle inspections must be secured and also provide them as necessary with technical supervisory on the inspection work because the large-scale repair works including changes in primary structure requires expertise and skills regarding the structure.

B. Establishment of inspection processes and procedures

On the large-scale repair processes and repair works where a discrepancy could likely occurs, the special inspection processes with a support from engineering organization must be established so that each process is checked for the proper work by the inspection properly.

In addition, the inspection items and procedures required for the final confirmation of safety to release must be established, too.

C. The inter-process inspection must be established as necessary for the work where the non-conformity cannot be found after completion of the work.

(5) Miscellaneous

A. A large-scale alteration with changes in the aircraft primary structure also requires the similar work management in accordance with this circular.

B. A review on the proper management system suitable to your organization in consideration to items prescribed in this circular must be pursued, and, as appropriate, it must be prescribed in the Approved maintenance and alternation exposition.

Attachment 3

KU-KEN-989

July 24, 1987

Attention; The president, aircraft manufacturing organizations
(The Boeing, Douglas, Lockheed, Airbus Industry)

Director-General, Civil Aviation Bureau

Maintaining airworthiness for aircraft after implementation of large scale repair

The investigation report for aircraft accident of Japan Air Lines, Boeing 747SR-100, JA8119 on August 12, 1985 was publicized by the Aircraft Accident Investigation Commission recently with submittal of recommendations as attached herewith.

In order to take the intention of the recommendation and apply the lessons learned of this accident to further aviation safety enforcement, the Department of Transportation specified, as shown in attachment herewith, the corrective action regarding a management system on a large-scale repair, including alteration on the aircraft primary structure, accomplished at locations other than the production facility of that aircraft and requested domestic air carriers and major repair organizations to implement that action.

Because your organization may have an opportunity where a repair of the Japan registered airplane is contracted by a Japanese air carrier, you are requested to establish the appropriate corrective actions regarding your management system for the repair in accordance with the following corrective actions.

In addition, a Japanese air carrier may request a technical support to you as the aircraft manufacturer in the future in accordance with the following corrective actions. Therefore, this authority requests your cooperation in this matter.

Managing large-scale structural repair conducted outside of Manufacturer's facility

When a large-scale structure repair with changes in the aircraft primary structure upon recovery and repair for structural damage by an aircraft accident is accomplished at other than the manufacturing facility, the followings must be paid attention because it is necessary to perform the repair carefully in consideration to the work characteristics and environment:

(1) Understanding of the structural damage condition

Inspection scope must be evaluated to collect information for the structural damage condition.

In evaluating the inspection scope technically, actions must be considered as necessary to obtain

assistance by the aircraft manufacturer.

(2) Establishing a basic policy of the repair

A. Evaluation of the level of repair difficulty

The level of repair difficulty must be evaluated technically whether the damaged area, thus requiring the repair, can be restored to airworthy condition as previous.

B. Evaluation of a scheme (or structure) of the repair implementation

A scheme of the repair work implementation must be evaluated including the selection of an appropriate repair site, considerations whether the repair can be accomplished internally, or whether a support from the manufacturer of the aircraft is necessary.

C. Evaluation of the repair scope and method

Repair scope and method of the damaged area must be evaluated with a support from the manufacturer of the aircraft as necessary so that the structure can maintain the fail safe concept.

(3) Scheme of the repair work

A. Secure of working personnel

The required personnel who can handle the repair work must be secured for the large-scale repair and also provide them as necessary with supervisory for familiarization with the work because the large-scale repair work including changes in primary structure requires expertise and skills regarding the structure.

B. Actions when special equipment or tools are required

When special equipment or tools are required to ensure the required accuracy, procedures for the work implementation must be evaluated with obtaining technical assistance from the aircraft manufacturer as necessary, to ensure the secure and stable implementation of the work.

(4) Scheme of the inspection of the repair work

A. Secure of inspection personnel

The required inspection personnel for the large-scale repair who can handle inspections must be secured and also provide them as necessary with technical supervisory on the inspection work because the large-scale repair works including changes in primary structure requires expertise and skills regarding the structure.

B. Establishment of inspection processes and procedures

On the large-scale repair processes and repair works where a discrepancy could likely occurs, the special inspection processes with a support from engineering organization must be established so that each process is checked for the proper work by the inspection properly.

In addition, the inspection items and procedures required for the final confirmation of safety to release must be established, too.

C. The inter-process inspection must be established as necessary for the work where the non-conformity cannot be found after completion of the work.

(5) Miscellaneous

A. A large-scale alteration with changes in the aircraft primary structure also requires the similar work management in accordance with this circular.

B. A review on the proper management system suitable to your organization in consideration to items prescribed in this circular must be pursued, and, as appropriate, it must be prescribed in the management document or manual.

Attachment 4

KU-KEN-989

July 24, 1987

Attention: The president, aircraft manufacturing organization
(The Mitsubishi Heavy Industry Co., Ltd)

Director, Airworthiness Division, Aviation Safety Department

Maintaining airworthiness for the aircraft after implementation of large-scale repair

The accident investigation report on the accident of JA8119, Boeing 747SR-100, belonged to the Japan Air Lines Co. Ltd., occurred on August 12, 1985 was published by the Aircraft Accident Investigation Commission (AAIC, currently JAPAN TRANSPORT SAFETY BOARD) recently with submittal of recommendations as attached herewith.

In order to take the intention of the recommendation and apply the lessons learned of this accident to further aviation safety enforcement, the Department of Transportation specified , as shown in the attachment herewith, the corrective action regarding a management system on a large-scale repair, including alteration on the aircraft primary structure, accomplished at other than the production facility of that aircraft, and requested domestic air carriers and major repair organizations to implement that action.

Because your organization may have an opportunity where a repair of the Japan registered airplane is contracted by a Japanese air carrier, you are requested to establish the appropriate corrective actions regarding your management system for the repair in accordance with the following corrective actions.

In addition, a Japanese air carrier may request a technical support to you as the aircraft manufacturer in the future in accordance with the following corrective actions. Therefore, this authority requests your cooperation in this matter.

Managing large-scale structural repair conducted outside of Manufacturer's facility

When a large-scale structure repair with changes in the aircraft primary structure upon recovery and repair for structural damage by an aircraft accident is accomplished at other than the manufacturing facility, you must pay attention to those specified in the Approved maintenance and alternation exposition and the followings because it is necessary to perform the repair carefully in consideration to the work characteristics and environment:

(1) Understanding of the structural damage condition

Inspection scope must be evaluated to collect information for the structural damage condition.

In evaluating the inspection scope technically, actions to obtain assistance by the aircraft manufacturer must be considered as necessary.

(2) Establishing a basic policy of the repair

A. Evaluation of the level of repair difficulty

The level of repair difficulty must be evaluated technically whether the damaged area, thus requiring the repair, can be restored to airworthy condition as previous.

B. Evaluation of a scheme (or structure) of the repair implementation

A scheme of the repair work implementation must be evaluated including the selection of an appropriate repair site, considerations whether the repair can be accomplished internally, or whether a support from the manufacturer of the aircraft is necessary.

C. Evaluation of the repair scope and method

Repair scope and method of the damaged area must be evaluated with a support from the manufacturer of the aircraft as necessary so that the structure can maintain the fail safe concept.

(3) Scheme of the repair work

A. Secure of working personnel

The required personnel who can handle the repair work must be secured for the large-scale repair and also provide them as necessary with supervisory for familiarization with the work because the large-scale repair work including changes in primary structure requires expertise and skills regarding the structure.

B. Actions when special equipment or tools are required

When special equipment or tools are required to ensure the required accuracy, procedures for the work implementation must be evaluated with obtaining technical assistance from the aircraft manufacturer as necessary, to ensure the secure and stable implementation of the work.

(4) Scheme of the inspection of the repair work

A. Secure of inspection personnel

The required inspection personnel for the large-scale repair who can handle inspections must be secured and also provide them as necessary with technical supervisory on the inspection work because the large-scale repair works including changes in primary structure requires expertise and skills regarding the structure.

B. Establishment of inspection processes and procedures

On the large-scale repair processes and repair works where a discrepancy could likely occurs, the special inspection processes with a support from engineering organization must be

established so that each process is checked for the proper work by the inspection properly.

In addition, the inspection items and procedures required for the final confirmation of safety to release must be established, too.

- C. The inter-process inspection must be established as necessary for the work where the non-conformity cannot be found after completion of the work.

(5) Miscellaneous

- A. A large-scale alteration with changes in the aircraft primary structure also requires the similar work management in accordance with this circular.

- B. A review on the proper management system suitable to your organization in consideration to items prescribed in this circular must be pursued, and, as appropriate, it must be prescribed in the management document or manual.

Attachment

Recommendation No.1

June 19, 1987

Attention to Honorable Ryutaro Hashimoto, the Minister of Transport

Aircraft Accident Investigation Commission

Chairman: Shun Takeda

Member: Yoshiomi Enomoto

Member: Kiyoshi Nishimura

Member: Jiro Koo

Member: Akira Azuma

RECOMMENDATION ON SECUREMENT OF AIRQWORTHINESS OF AIRCRAFT

Aircraft Accident Investigation Commission (AAIC) has completed the accident investigation on JA8119, a Boeing 747 SR-100 of Japan Air Lines Co. Ltd., which crashed into mountains of Ueno Village, Tano County, Gunma Prefecture, Japan on August 12, 1985.

Based on the investigation results, the AAIC recommends the followings pursuant to the provision of Paragraph 1 of Article 21 of the Aircraft Accident Investigation Commission Establishment Law because the AAIC believes that they should be conducive promptly to prevent of aircraft accidents.

1. In case where large-scale repairs such as modification of primary structural elements of an aircraft are carried out at a place other than the factory where the said aircraft was manufactured, for recovery from or repair of damage caused by aircraft accident, as much guidance (supervisory) as possible should be provided to the repair agency engaged in the repair work so that the planning and management of the repairs are conducted with special care as individual condition requires.
2. In case where large-scale repairs such as modification of primary structural elements of an aircraft are carried out for recovery from or repair of damage caused by aircraft accident, as much guidance (supervisory) as possible should be provided to aircraft operator so that special instruction (inspection) items, if necessary, are established for the portion concerned and continuous monitor is maintained.
3. In this accident, ruptures of the fuselage tail, vertical fin, and hydraulic flight control systems were caused as a chain reaction by flow-out of the pressurized air due to rupture of aft pressure bulkhead. To prevent the recurrence of such situation, a study should be initiated on the addition to the airworthiness criteria of the provisions concerning the fail-safe capability of peripheral structures, functional systems etc. against rupture of pressurized structural components such as

the aft pressure bulkhead on a large aircraft.