

# **Appendix L**

## **Airbus A300**

### **Supplemental Structural Inspection Document**

### **Summary**

#### **Airplane information**

Construction of the first A300 began in September 1969, and in December 1970 Airbus Industries was established to oversee the project. The first flight of the airplane was on October 28, 1972. European certification was granted on March 15, 1974, and the US certification followed on May 30, 1974. Different series of A300 are B1, B2, B4-100, B4-200, C4, F4 and B4-600. The series included on TCDS are B2, B4-100, B4-200 and B4-600. All the series are certified to FAR 25.571 pre-amendment 45, however Airbus has developed an ALI for B4-600 and is planning to apply to regulatory agencies for an upgrade to the certification bases. This airplane is short/medium range commercial transport with passenger capacity between 220 to maximum of 336, depending on the layout.

#### **SSID Document**

The purpose of the Supplemental Structural Inspection Program (SSIP), also referred to as SSID, is to ensure continued structural airworthiness of the A300 airplanes Series B2, B4-100, B4-200, C4, F4. This program has been developed in accordance with the requirements of DGAC/SFACT/TC 53652, FAA AC 91-56, and CAA Airworthiness Notice n° 89.

The current revision level of this document is revision number 3, dated Jan 1997. It was approved by the DGAC on March 6, 1998, but has not been approved by FAA. The earliest revision of this document is revision number 0, dated August 1989. The other two revisions of this document are dated March 1993 and June 1994. Each of the revisions to the SSID has been approved by DGAC. Revision 0 of this document was approved by AD 93-01-24. This AD was superseded by AD 96-13-11, which mandates Revision 2 of the SSID.

The AD does not allow:

- 1) Flight with known cracks. Every detected crack must be repaired prior to further flight.
- 2) Operators to use the risk ratio (RR) to adjust their inspection program.

The objective is to maintain continuous airworthiness of the airplanes based on a reassessment of the structure using the damage tolerance concept. The reassessment of the structure includes:

- Identification of parts of the structure which contribute significantly to carrying flight, ground, pressure and control loads whose failure could affect the integrity of the A/C

structure, and when damage tolerance characteristics may not be achieved by previously recommended inspections. These items are called Structural Significant Details (SSD).

- Performance of damage tolerance calculations considering residual strength under typical flight mission profiles and multiple site damage when applicable.
- Determination of inspection program providing a high probability of detection of fatigue damage before residual strength below the required level.

This document is effective to all in-service A300 airplanes series mentioned above (A300-600 is excluded). The Design Service Goals of different models are as follows:

48,000 flight cycles for A300 B2 Series

40,000 flight cycles for A300 B4-100 Series

34,000 flight cycles for A300 B4-200, C4 and F4 Series

When airplanes are operated beyond these values, additions and/or changes may be introduced by revision of this program.

When airplanes are operated with longer planned flight time the inspection requirements (threshold and intervals) and the DSG of each considered items quoted above need to be adjusted in accordance with instructions given in section 4-4 of the document. The value of the threshold and intervals must be adjusted by multiplying them by an Adjustment Factor (AF) depending on 1) the average flight time of the individual airplane and 2) the fatigue rating of the concerned SSD.

The SSD's are classified as Class A and B based on fatigue tests, tear down results and pure damage tolerance calculations. Class A SSD's were demonstrated to be fatigue sensitive due to an early cracking occurrence during the fatigue tests. Such SSD's are required to be inspected on all affected airplanes by means of Service Bulletins (Section 6). Class B SSD's were demonstrated to be less fatigue sensitive due to late cracking occurrence during the fatigue tests or further to fatigue calculations. Such SSD's are required to be inspected on selected number of airplanes called Fleet Leader Airplanes (FLA) in accordance with instructions given in Sections 7 and 9.

Selection of FLA is made by Airbus Industries. Inspection results of the FLA must be reported to Airbus Industries. This program will be revised when FLA approach the DSG and/or when dictated by experience. Individual aircrafts in the Fleet Leader Program (FLP) for SSD's from Section 9 are listed in Section 5 on Pages 4 to 35 and for MRB/SSIs from section 7 on Pages 36 and 37 of Section 5.

A method called Risk Ratio (RR) is used in the SSID to provide flexibility to the operators in their inspection threshold and repeat intervals for Class B SSD's of Section 9. This flexibility is not allowed by AD 96-13-11.

Inspection requirements for class A in Section 6 and Class B in Section 7 are valid and effective for non-repaired SSD's. Where a SSD has previously been subject to a repair the requirements in Section 6 may not be applicable unless specified otherwise. The operator must contact and provide ABI in due course with details of the performed repair to enable an appropriate evaluation to be made.

Whenever the series designation is changed in the life of a particular aircraft, method indicated in Section 4.7 should be used to determine the new inspection program. No special inspection instructions are included in the document and/or AD for repaired or modified structures.

The program as described in the Airbus supplemental structural inspection document and approved by DGAC allow the operators to fly with existing cracks, provided prescribed repetitive inspections are performed on the subject structure. However, the FAA AD does not allow any structures with known cracks to continue further flight without installation of a permanent repair.

### **Repair and alteration**

What happens when a crack is found? Repair instructions and requirements  
Does the program provide instruction for repairs and alternation?

### **AD Information**

AD 96-13-11 mandated the Revision 2 of the SSID. This AD does not allow the operators to operate their airplanes with a known crack. All the detected cracks must be repaired prior to further flight. Also the AD does not allow the operators to use risk ratio (RR) to modify the inspection program for Class B structures given in Section 9.

Compliance time to perform a DTA for repairs and modification accomplished per DGAC is 6 months.

# **BAC 1-11**

## **Supplemental Structural Inspection Document Summary**

### **Airplane Information**

The BAC 1-11 was manufactured by British Aerospace (BAe) and was originally certified in the United States (US) on April 15, 1965. The various series of BAC 1-11 are 200, 300, 400, 500 and 475. Currently there are 123 airplanes of these models worldwide, of which 13 are being operated in the US. The FAA Type Certificate Data Sheet number A5EU, currently at revision 25, only specifies the 200 and 400 series as being certified in the US. The original design service goal of this airplane was 85,000 flight hours and flight cycles, whichever occurs first. The average age for the US fleet is 36 years with the highest time airplane having accumulated 36,000 total flight cycles. The operating cabin pressure is 7.5 Psi.

### **SSID Document**

BAe has undertaken a Structural Integrity Audit in compliance with Civil Aviation Authority Airworthiness Notice Number 89 to assess the continuing recommendations in relation to the aircraft's damage tolerance characteristics. The content of this document also meets the requirement of FAA AC 91-56. The outcome of this evaluation has been to confirm the validity of continuing with a second cycle of the existing structural maintenance program requirements, for the operation of individual aircraft up to the current limit of 85,000 flight cycles or flight hours, whichever occurs earlier, together with inspection of a number of particular areas which have been determined to warrant special consideration. It is these latter items that are the subject of BAC 1-11 Supplemental Structural Inspection Program (51-A-PM5830 Alert Service Bulletin). This document is applicable to 200, 300, 400 and 500 series, and not to 475 at this time. This document was originally released on December 12, 1981, and currently is at revision 4, dated January 28, 1993. This Alert Service Bulletin has the approval of the United Kingdom Civil Aviation Authority. FAA AD 95-15-07 mandates revision 4 of this document. This AD supercedes AD 87-24-06 and AD 87-24-06R1.

The special inspections, according to this document, has been based on the premise that the requirements of the Maintenance Planning Document (MPD) are currently being implemented for the purpose of detecting cracks, corrosion and other damage during normal service operation. The inspection threshold and repeat intervals for the new requirements have been based on an analysis of each area, taking account of detectable damage size, damage growth characteristics, and the residual strength of damaged structure in relation to maintaining airworthiness through damage tolerance and inspection. Since it is essential to the overall management of the structure program to be evaluated there is a feedback requirements. It is anticipated for this program to be adjusted based on the feedback received from the operators.

According to UK CAA this program is based on fatigue and durability principals applied to all the specified aircraft series. UK CAA informed us that the structural selection of “critical areas” equivalent PSE’s was based on service experience and a structural audit assessment similar to an MSG-3 structural logic analysis. During the development of this document where ever no service experience was available, BAe analysis approach was to assume a pre-existing flaw at the most adverse locations of the “critical areas” to be present at the time of airplane entry to the service. Also they indicated that when a crack finding is reported the defect envelope is exceeded and the inspection program is revised. Even prior to notifying the CAA the operators are to inspect the surrounding areas of the specific structure that the crack was found. All defects found must be repaired by an approved method such as Structural Repair Manual prior to further flight. The inspection findings (positive and negative) must be forwarded to the manager of BAe for recording and evaluation purposes.

In Section 2 it is emphasized that this program is currently limited to 85,000 landings or flying hours, whichever occurs earlier. All the airplanes are subject to the inspection delineated in Table 1. In this table the reference number, inspection threshold, repeat intervals and inspection method for 32 structural items, for which special inspection is deemed to be required, is given. Pictures of several of these structures are provided in Figure 1. All initial inspection thresholds for items listed in Table 1 has been given in terms of number of landing. Description of the structures that are subject to this service bulletin is not specified in this document. There is no indication of any full-scale fatigue test to validate the scope of this program.

The inspection results for engine mount/attachment structure on aircraft fitted with Rolls-Royce (RR) Spey Mk 506 engines is required to be forwarded to BAe from five high-time aircraft (200 series). These details of the inspection program for these structures are found in Table 2. These inspections must be accomplished between 68,000 and 72,000 landings and before the fleet leader nominally exceeds 72,000 landings. According to Section 4.9, up to issue 3 of this Service Bulletin (SB), all forwarded inspections indicated “nil finding”. The same structures for RR Spey Mk 511 engines must be inspected and results forwarded to BAe for all the airplanes 200/300/500. The first inspections must be accomplished at the cycles indicated earlier. Details of structural parts with safe life limits less than 85,000 landings for engine mount/attachment structure on aircraft fitted with RR Spey Mk 512 engines are given in Table 3. For the last category of structures all aircraft must forward their inspection results to BAe. The first inspection of the latter category of structures must take place between 67,000 and 71,000 landings.

This document also requires the operators to compile the requirements of 30 additional alert SB’s as appropriate. Many of these SB’s and others are listed in Appendix B for reference only. For the benefit of the operators a list of recommended structure inspections addressing the monitoring of fatigue degradation together with their respective MPD periodicities included in Appendix D.

The effects of corrosion have not been included in the evaluation of inspection thresholds and repeat intervals, since operating environment, local airline housekeeping and maintenance practices can introduce significant variations in this occurrence. The corrosion issues for susceptible areas (annotated by “c” in Table 1) are addressed in the MPD and CAA Mandatory Alert Service bulletin 5-A-PM 5987.

As an example the fuselage skin along rivet lines furthest from the joint center line at butt joints in body station 456 and 630 between stringers 10L and 10R should be eddy current inspected first at 60,000 landings. The same inspections is repeated on the 200 series every 5,000 landings, and on the 400 series every 3,200 landings (see table 1 reference number 53-30-1T).

# **Boeing 707/720 Supplemental Structural Inspection Document Summary**

## **Airplane Information**

The civilian Boeing 707 was the first American built jetliner. The first Boeing 707 airplanes were introduced into airline service in 1958 followed by the Model 720 in 1961. The passenger capacity of the 707/720 airplanes is from 150 to 189, dependant on series and configuration. The Boeing 707 is covered by three Type Certificate Datasheets (TCDS) as follows:

<u>Model</u>	<u>TCDS</u>
707-100, -200 Series	4A21
707-300, -400 Series	4A26
720	4A28

Currently, the 707/720 fleet consists of 358 registered airplanes worldwide, of these only 150 are in active use. Of the 150 airplanes in active use worldwide, only 50 are in civilian use. There are currently 8 U.S. registered civilian 707/720 airplanes. The design service goal (DSG) of the 707/720 is 20,000 cycles or 60,000 hours.

## **SSID Document**

The Boeing 707/720 Supplemental Structural Inspection Document (SSID), Document No. D6-44860 was originally issued in 1979. The stated purpose of the document is to ensure continuing structural airworthiness of the 707/720 airplanes in accordance with the requirements of FAA AC 91-56 and UK CAA Airworthiness Notice No. 89. Airworthiness Directive (AD) 85-12-01 R1 mandates the 707/720 SSID No. D6-44860, Revision M. The current revision of the document is Revision P, dated April 13, 1994. There was no Revision O. Revision P was approved as an alternative method of compliance (AMOC) to AD 85-12-01 in July 1994. After its issuance in 1994, FAA informed Boeing that they planned to mandate revision P; however, it was never done. Revision P adds about 14 Significant Structural Details (SSD's) and also revises many SSDs.

The Boeing 707/720 SSID defines SSD's as those designated structural items that contribute significantly to the carrying of flight, ground, or pressure loads or whose failure could affect the structural integrity of the airplane. The document divides SSD's into two categories; Fleet Sampling Details and Known Fatigue Problems. Fleet Sampling Details are SSDs with no reported fatigue problems (Section 7.0 of the document). Known Fatigue Problem Details are SSD's with reported fatigue cracking (Section 8.0). The use of the term "Fleet Sampling" is not intended to infer that the inspection program in a "sampling" program. The term is used to refer to SSD's with no

reported fatigue problems, for which thresholds were to be reviewed periodically and possible increased when sufficient inspections were completed, provided that no problems had been found and there was adequate fleet coverage above any new, higher threshold.

The 707/720 SSID requires that all cracks involving SSDs or related structure be reported promptly (within 5 working days) to Boeing. AD 85-12-01 R1 requires that the revision to the operators maintenance program incorporating the SSID include procedures to notify the manufacturer when SSD's are found cracked. Boeing has indicated that in the past 7 years they have not received a single report of cracking.

Sections 5.2 of the SSID allows for extension of inspection intervals (cycles) for airplanes operating at a shorter than average flight length. AD 85-12-01 R1 specifically prohibits the use of these extensions unless an alternative method of compliance is granted.

In establishing the list of SSDs, Boeing used advanced analysis techniques not available during the original design of the Model 707/720. This analysis revealed that certain details now require increased emphasis in the maintenance program. The specific inspection requirements designated are based on analysis of minimum detectable size and growth characteristics of cracks and residual strength of the damaged structure. Some details were found to require the application of special inspection techniques to ensure the damage tolerance of the design. Inspection techniques include close visual, high and low frequency eddy current, x-ray, and magnetic particle.

### **Repairs and alterations**

The SSID states that "SSD inspections may not apply to areas that have been repaired. Contact Boeing, per Section 6, regarding applicability by providing SSD number, repair details/date and advise if Boeing was involved in the design approval or installation." The SSD AD 85-12-01 R1 does not have any specific or different requirements for inspection of repaired or modified SSDs.

### **AD Information**

The 707/720 SSID No. D6-44860, Rev. M is mandated by AD 85-12-01 R1. The current revision level of the 707/720 SSID is Revision P, dated April 13, 1994. The AD requires inspection of the identified SSD's on all 707/720 airplanes. If a crack is found during a SSID inspection, the AD requires that it be (1) replaced with a serviceable FAA approved part of the same part number, or an FAA approved replacement part provided by the manufacturer; or (2) repaired in accordance with the Boeing Structural Repair Manual or repaired in accordance with a method approved by the Manager of the Seattle Aircraft Certification Office. The AD includes a requirement to notify the manufacturer when SSD's are found cracked. The AD has no specific requirement for additional assessment or inspection of repaired or altered SSDs.



# **Fokker F28**

## **Supplemental Structural Inspection Document**

### **Summary**

#### **Airplane Information**

The passenger capacity of the Fokker F28 is from 55 to 85 dependent on series and configuration. The U.S. Type Certificate Data Sheet (TCDS) Number A20EU was originally issued March 24, 1969. The FAA TCDS includes the F28 Mark 1000, Mark 2000, Mark 3000, Mark 4000. The F28 fleet currently includes 208 airplanes worldwide, including 25 U.S. registered airplanes. The Design Service Goal (DSG) of the F28 is 90,000 cycles.

#### **SSID Document**

The Fokker F28 Structural Integrity Program (SIP), Document 28438 was originally issued in 1982. Airworthiness Directive (AD) No. 93-13-04 issued June 29, 1993 mandates inspections, repairs, and replacements defined in the SIP Document, Part I, including revisions through October 15, 1992. The applicability of AD 93-13-04 is Model F28 Mark 1000, 2000, 3000 and 4000 series airplanes. The Mark 0100 and Mark 0070 airplanes are not included in the AD applicability because their certification basis is through Amendment 25-60; therefore, they have Instructions for Continued Airworthiness, including an Rijksluchtvaartdienst (RLD) approved Airworthiness Limitations Section.

The F28 SIP includes an Inspection Sheet for each task. Tasks can be either an inspection or a retirement life. The inspection can look for fatigue or stress corrosion cracks. The task defines the item of structure to be inspected or retired and gives further details including initial and repeat inspection times or retirement life as applicable. The SIP requires each inspection to be accomplished on all of the affected F28 marks and versions. The latest revision to the SIP Document is revision 13, dated December 30, 1997. The RLD AD 82-026, issued 7/1/82, automatically mandates the most recent revisions. There are four temporary revisions (TR) to the SIP Document: 13-1, 13-2, 13-3, and 13-4 dated October 16, 2000. The FAA has issued alternative methods of compliance (AMOC) through TR 13-3.

Fokker performed full scale and detail tests as well as fatigue analyses of the F28 primary structure during the original certification of the F28. The fatigue inspection requirements resulting from these tests and analysis were originally included in Service Bulletins (SB) F28/5-1 and F28/5-2. Introduction of the SIP Document in 1982 canceled these SB's. In the course of its operation Fokker adds service experience, including stress corrosion, to the test evidence as the aircraft builds up experience. The areas of concern, new designs and developments and service experience are evaluated using the current JAR/FAR

25.571 standards, including damage tolerance assessments. The RLD has indicated that the program is based on a rogue flaw assumption. All fatigue and stress corrosion problems of safety concern (catastrophic and hazardous failure conditions), which result from the analysis requiring a repetitive inspection or a life limitation, are specified in the “inspection and retirement life task sheets”. Fokker has indicated that the scope of their SIP goes further than FAR 25.571. This is because not only are PSEs, the failure of which could cause catastrophic failure of the airplane covered; structural components that may lead to hazardous failure conditions are covered. The Fokker F28 SIP Document is in compliance with AC 91-56.

The SIP Document restricts operation of the F28 to 90,000 landings. However, the Document states that operators can extend the operation for individual F28 aircraft up to 100,000 landings, by incorporating SB F28/51-26. When SB F28/51-26 has been accomplished a supplement to the SIP document is issued for the subject aircraft. The 90,000 landing operation restriction is not imposed by the FAA TCDS or FAA mandated by AD 93-13-04.

### **Repairs and alterations**

AD 93-13-04 requires that cracked structure detected during the inspections required by the AD be repaired or replaced, prior to further flight, in accordance with the SIP or in accordance with data meeting the certification basis of the airplane and approved by the FAA, ANM-113 or the RLD. The SIP Document states that in general postponement of repair is not allowed, unless specified within the document. The SIP Document does give repair postponement criteria in some cases. The repair postponement criteria are only applicable for cracks with origin and direction as addressed on the inspection sheet. The document states that in cases where the cracks differ from those specified, this postponement cannot be used without consulting Fokker. The F28 SIP Document, Section 1.2, pg.5 has a requirement to report cracks to Fokker. This reporting requirement is also in the AD.

The SIP Document states “When an area has been repaired by a non-standard repair, e.g. designed by the operator or by Fokker for an individual aircraft, but not published in the Structural Repair Manual or a Service Bulletin, the inspection times and referenced inspection procedures in this document may not be applicable for the subject repair. The supplemental maintenance requirements, if required, have to be reviewed on a case-by-case basis. If the operator finds a non-standard repair in the inspection area and there is no fatigue and damage tolerance analysis substantiating the design, the operator may contact Fokker.” The impact of repairs and modifications on the SIP is not addressed in the U.S. AD.

## **AD Information**

The F28 SIP Document No. 28438, Rev. October 15, 1992 is mandated by AD 93-13-04. The current revision level of the 707/720 SIP Document is Revision 13, dated December 30, 1997. There are also four temporary revisions (TR) to the SIP Document: 13-1, 13-2, 13-3, and 13-4 dated October 16, 2000. The AD requires inspections, repairs and replacements defined in the SIP Document. There is also a requirement in the AD to report inspection results to Fokker, when a crack is detected. The F28 SIP allows flight with cracks within the limitations specified in the SIP Document. However, the US AD requires that cracked structure be repaired or replaced in accordance with the Fokker SIP Document, or in accordance with other data meeting the certification basis of the airplane which is approved by the Manager, Standardization Branch, ANM-113, FAA or by the RLD, prior to further flight. The AD has no specific requirement for additional assessment or inspection of repairs or alterations.

# Lockheed Martin L-1011

## Supplemental Structural Inspection Document

### Summary

#### Airplane Information

The first L-1011 Tri-Star aircraft were introduced into airline service in late 1972, and was certified with a 280 maximum passenger configuration as documented in type certificate data sheet number A23WE, revision 17. The total production of L-1011 Tri-Star's was 250 aircraft with 101 currently registered in the US. Of the 101 US registered aircraft only 33 of those are in active operation, with 75 total aircraft in active operation worldwide. The L-1011 was produced with a design service goal (DSG) of 36,000 flight cycles for all configurations, with maximum gross takeoff weights ranging from 430,000 pounds to 516,000 pounds. As of May 2001, the average ages of the 75 active L-1011 are 22 years with the following additional fleet statistics:

<u>Model designation</u>	<u>Operational Aircraft</u>	<u>Average Hours</u>	<u>Average Cycles</u>
L-1011-385-1	22	60,126	26,961
L-1011-385-1-14:	7	61,767	24,252
L-1011-385-1-15:	15	63,322	20,178
L-1011-385-3:	31	43,264	11,691

#### SSID Document

The Lockheed Martin L-1011 Supplemental Structural Inspection Document (SSID), document No. LG92ER0060 was originally issued in December 1992. The stated purpose of the document is to ensure safe operation of the L-1011 throughout its operational life, and was prepared in response to the guidance material as presented in Advisory Circular (AC) 91-56. The 1994 SSID is the latest revision and is mandated by Airworthiness Directive (AD) 95-20-04 R1, and is applicable to L-1011-385-1, 1-14, 1-15 series airplanes. Lockheed Martin is currently working on a revision to the SSID to incorporate the L-1011-385-3 series airplane and is projecting a completion date of December 2001. As of June 2001, the highest time US registered -3 aircraft have accumulated 78,400 hours and 17,900 cycles.

Lockheed Martin uses the term Structurally Significant Detail (SSD) to describe those structural parts and components which carry significant ground, flight, cabin pressure or control loads whose failure could affect the safety of the airplane. The criteria for selection of SSD's for the SSID was as follows:

- Fatigue critical areas that have been significantly modified and not fully substantiated by tests.
- Structural parts and components with details similar to those for which failures have occurred in test or service, but have not experienced in-service failures.

- Structural components that have design features that contain hidden areas that would make cracks more likely to be undetected.
- Structural components, which have been shown by tests, service experience or analysis to have crack growth characteristics that could have an interactive effect on adjacent parts.
- Structurally Significant Items (SSI) from the MRB report for which specified sampling inspection percentages are not adequate as the L-1011 fleet ages.

Fatigue and fracture mechanics analysis results for each of the locations were used to determine supplemental inspection thresholds. The location may have experienced fatigue damage during the full airplane fatigue test; if so, the fatigue life was indexed to the test demonstrated life. If no test data were available, analytical fatigue and fracture results were considered according to the following procedure:

### Fatigue Analysis

<u>Fatigue Quality</u>	<u>Life Reduction Factor</u>
$K_{TEST}$	2.0
$K_{ANALYTICAL}$	4.0
$K_{PARAMETRIC} = 6$	1.0

### Fracture Mechanics Analysis

$$a_{INITIAL} = .05 \text{ inches}$$

$$\text{Crack Growth Life} = \text{Flights from } a_{INITIAL} \text{ to } a_{CRITICAL}$$

### Inspection Threshold Derivation

$$T = \frac{1}{2} \text{ Test Life (if demonstrated)}$$

Or the greater of:

$$T = \frac{1}{4} \text{ Analytical Life}$$

$$T = \text{Parametric Life at } K=6$$

T not to exceed crack growth life

## Recurring Inspection Interval Derivation

Inspectable crack growth interval = flights from  $a_{\text{DETECTABLE}}$  to  $a_{\text{CRITICAL}}$

$R = \frac{1}{2}$  inspectable crack growth interval

The Lockheed Martin SSID program is applicable to all L-1011 model airplanes except for the L-1011-3 with 100% inspection requirements. Work is currently underway on the development of a SSID program for the L-1011-3. Operators of the L-1011-3 are encouraged to perform the SSID inspection for unmodified structure using the 474 maximum gross takeoff weight requirements until the L-1011-3 SSID is complete.

## Repairs and Alterations

The Lockheed Martin SSID specifies that any structural repairs encountered during incorporation of the SSID requirements which alter the structural configuration evaluated for the SSID will be handled on a case-by-case situation through normal operator support procedures. The limitation section of the document specifies that various modifications accomplished by non-Lockheed organizations have not been evaluated as a part of the Lockheed SSID and the inspection requirements are not included for those modifications. It further states that evaluation has not been accomplished to determine the effect of these modifications on other areas of the original design construction, particularly if a change in aircraft usage beyond that described in section II of the document is involved. The Lockheed SSID has a data reporting system for reporting the findings from the SSID inspections. The SSID requests 16 items of information which also includes whether the discrepancy was corrosion and the type of corrosion (i.e. exfoliation, filiform, stress corrosion, etc.), or whether the discrepancy was a crack.

## AD Information

AD 95-20-04 R1 was issued in December of 1995, and requires that the SSID be incorporated into the operators maintenance program with the inspections accomplished in accordance with the SSID. The AD also specifies that if any cracking is found in any SSD defined in the Lockheed SSID, prior to further flight a repair must be accomplished in accordance with either of the following:

1. The applicable service bulletin referenced in the Lockheed SSID, or
2. The structural repair manual, or
3. A method approved by the manager of the Atlanta ACO.

The AD has a reporting requirement where the results whether positive or negative must be reported to Lockheed within 30 days after returning the airplane to service, in accordance with the data reporting system identified in the Lockheed SSID. The AD has no instructions for SSID structure that has been previously repaired or modified by a supplemental type certificate, such that the inspections in the SSID cannot be accomplished.

# **CASA C-212**

## **Supplemental Structural Inspection Document**

### **Summary**

#### **Airplane Information**

The CASA C-212-CB was the first to receive United States (US) certification on February 22, 1977, with a maximum passenger capacity of 19 as documented in Type Certificate Data Sheet (TCDS) A43EU, revision 8. A total of 6 additional models of the C-212 were subsequently certified, each one having the maximum passenger capacity increased to 28, with the C-212-DE being the last model certified on October 1, 1991. There are a total of 274 CASA C-212 in operation worldwide with 24 currently registered in the US.

#### **SSID Document**

CASA supplemental inspection document (SID) number C-212-PV-01-SID dated June 1, 1987, was the first SID document to be mandated by the Spanish Dirección General de Aviación Civil (DGAC) and the FAA. SID document C-212-PV-02-SID was issued later on June 1, 1997. The later document added the –300 series airplanes (-DE and –DF models) to the SID. The CASA SID was developed in response to FAA Advisory Circular 91-56.

CASA uses the term Principal Structural Element (PSE), where a PSE is defined as a structural part or assembly of parts whose failure, if it remained undetected, could lead to the loss of the aircraft. The latest SID document contains inspections instructions for a total of 66 PSE's.

The CASA SID contains instructions for a Sampling Rotational Program (SRP). Only certain PSE's are applicable for the SRP with either a 1/3 or 1/6 fleet sample to be accomplished at the inspection intervals, provided all PSE's of the operator's entire fleet were inspected at the threshold. The SRP is further limited to the aircraft contained in the operators own fleet, which means that operators cannot be grouped together in order to obtain advantages of the SRP. If the SRP is not applied for the applicable PSE's, then all aircraft must be inspected when they reach the repeat inspection interval. A further allowance of the SRP is that symmetrically equal PSE's can be grouped so that only one side of the airplane need be inspected at the inspection interval with the opposite side inspected at the PSE's next inspection interval.

The CASA SID contains instructions for both positive and negative inspection findings to be reported back to the manufacture. CASA defines a follow-up action to be accomplished by the manufacture following any positive discrepancy reports.

1. CASA will report actual data available on the finding to the operators and Airworthiness Authorities.

2. If required, CASA will develop a fleet inspection program to obtain additional data necessary to formulate a service bulletin.
3. CASA will prepare and issue a service bulletin addressing recommended structural modifications and inspections.
4. CASA will revise the supplemental structural inspection document to eliminate the PSE or a portion of the PSE and reference the new service bulletin in the list of service bulletins with flight safety addenda.

### **Repairs and Alterations**

The CASA SID document does not contain any instructions for repairs, alterations or modifications that may be on the aircraft or may hinder the ability to accomplish the inspections defined in the SID.

### **AD Information**

The FAA issued AD 96-07-14 on March 28, 1996, mandating the incorporation of CASA SID document C-212-PV-01-SID, dated June 1, 1987. This AD also required the replacement of certain horizontal stabilizer-to-fuselage attach fittings on the C-212-CB series airplanes. This AD is only applicable to the first 5 model C-212 model airplanes certified in the US, because the CASA SID did not include those models. However, the latest CASA SID document includes all C-212 model airplanes, but is not currently mandated by FAA AD.

The FAA AD does have limited instructions for airplanes that have been modified, altered, or repaired such that the performance of the requirements of the AD is affected. The operators are instructed to request an alternative method of compliance to the AD, which must include an assessment of the effect of the modification, alteration, or repair on the AD.

The AD instructs that any cracked structure detected during the inspections required by the AD must be repaired or replaced prior to further flight. The AD also instructs the operators to report the results of each inspection (positive or negative) to CASA.