***BY ORDER OF THE COMMANDER***
***PACIFIC AIR FORCE FORCES***

***AIR FORCE INSTRUCTION 21-101***

***PACIFIC AIR FORCE FORCES***
***Supplement***

***27 FEBRUARY 2020***

***Maintenance***

# *PACAF: AIRCRAFT AND EQUIPMENT MAINTENANCE MANAGEMENT (F-22)*

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OPR: PACAF/A4MM

Certified by: PACAF/ A4M
(Col Artolachipe)

Pages: 32

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This addendum complements AFI 21-101, *Aircraft and Equipment Maintenance Management*. This addendum prescribes policies and procedures governing aerospace equipment maintenance management of F-22 aircraft for Pacific Air Force Command (PACAF). This addendum does not apply to the Air National Guard (ANG) or Air Force Reserve Command (AFRC); however, ANG/AFRC personnel assigned to Classic Associate Units supporting PACAF units will comply with the guidance provided within this supplement. This publication will not be supplemented or further implemented/extended. Maintenance units will use this instruction in conjunction with the PACAF supplement to AFI 21-101; if a conflict exists between the PACAF supplement and this addendum the addendum will take precedence. Chapters align with AFI 21-101 and with the PACAF supplement to AFI 21-101. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (T-2, T-3) number following the compliance statement. Waivers for T-0, T-1, T-2 or non-tiered compliance items will be sent to HQ PACAF/A4M, **pacaf.a4mv3@us.af.mil**. Refer recommended changes and questions about this publication through the appropriate functional chain of command to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

## Chapter 1

## MANAGEMENT PHILOSOPHY AND POLICY

**1.3. Maintenance Concept.**

1.3.3.1. **(Added)** Maintenance Assistance Requests: advice, assistance, and training pertaining to installation, operation, and maintenance of equipment using currently authorized procedures; authorization for one-time, limited duration or permanent repairs beyond existing technical order (TO) procedures; authorization for limited use of non-listed substitutes to prevent work stoppage. On direction from the Production Superintendent, Action Requests (AR) are submitted through the Field Information Network (FIN) system and distributed via email through the AR distribution list. Units submit a -107/AR in FIN IAW T.O. 00-25-107, *Maintenance Assistance*.

1.3.3.2. **(Added)** The MAJCOM communicates with the field through Raptor Support Team (RST Messages). The RST drafts and publishes messages under the authority and on behalf of the MAJCOM.

1.3.3.3. **(Added)** RST messages are sent to the MXG Organizations for notification of Integrated Maintenance Information System (IMIS) Event Relationship File (ERF) and electronic checklists. Field notifications include a summary of changes, procedures to load and update, authority to load with completion suspense. The messages are released to the field no later than 7-days prior to actual release. As a minimum, RST messages are to be delivered to each F-22 MXG, QA OIC/SUPT, PIM, TODO, AFETS, HQ PACAF/A4, NGB/A4 and HQ/ACC A4F22 organizational e-mail boxes; distribution to all levels of maintenance is appropriate. Waivers for deferment beyond RST message suspense may be requested under extenuating circumstances through HQ ACC/A4F22. **Note**: Message distribution may require download from a secure site in lieu of e-mail.

**1.12. Maintenance Information Systems (MIS).**

1.12.1.1. **(Added)** IMIS is the MIS of input for F-22 aircraft maintenance actions; however, IMDS remains the MIS of record and entry for PS&D inputs/actions. IMIS users and managers should consider each MIS applicable when MIS is referenced throughout this and other AFIs/TOs. IMIS will accurately reflect all F-22 maintenance actions. Personnel documenting maintenance should have access to and be trained/qualified to use IMIS and IMDS as applicable to their AFSC.

1.12.1.2. **(Added)** Once equipment (e.g., AFE, AME, ejection seat, gun) is removed from the aircraft through IMIS, subsequent off equipment maintenance will be documented in IMIS parts forms. **(T-2).** The owning work centers performing off-equipment maintenance require parts manager access to update IMIS with configuration management updates to the end item. Parts manager to be at minimum 7 skill level.

1.12.1.3. **(Added)** Electronic aircraft forms (e-forms): The F-22 operates with e-forms and e-TOs that are utilized on remote PMAs that are docked/undocked (synchronized) with a squadron/base level server; this ensures the master aircraft forms and TO data base are maintained. Synchronization will be accomplished through a physical dock/undock process or via an RF link between the PMA and the server where RF infrastructure is available. **(T-2).**

1.12.1.4. **(Added)** During "comm-out" or RF unavailability conditions, each aircraft should have a dedicated PMA (aircraft e-forms drive) to ensure adequate control of the most current status/maintenance documentation. If in a "comm-out" scenario and an aircraft on the flying schedule is time constrained for hard dock/undock (e.g. quick turn), the aircraft expeditor or flight line supervisor will ensure aircraft e-forms, status and/or debrief actions are reconciled between undocked PMA and server work station to facilitate continued sortie generation of maintenance activities. **(T-2).**

1.12.1.5. **(Added)** Only one set of e-forms will be undocked per aircraft from the IMIS server to ensure the integrity of aircraft safety and maintenance documentation. **(T-2).** An IMIS hard drive may be utilized as an "All Data Drive" for Pro Super/Expediter review only, and should be updated in the same fashion as normal aircraft e-forms. A backup drive can be used during deployment operations.

1.12.1.6. **(Added)** E-forms documentation is not generally accomplished on classified hard drives, unless pertaining to classified maintenance.

1.12.1.7. **(Added)** E-forms documentation may be accomplished on a Maintenance Server Workstation (MSW) after ensuring that the aircraft forms drive is docked to the IMIS Server/turned in to support.

## Chapter 2

## GENERAL RESPONSIBILITIES FOR COMMANDERS AND KEY LEADERS

**2.2. Wing Commander (WG/CC) Responsibilities.**

2.2.1.2. **(Added)** Ensure funding is available to facilitate annual F-22 Signature Management Program (SMP) flight test and potential indoor Radar Cross Section (RCS) test requirements.

2.2.1.3. **(Added)** Ensure either Wing and/or Operations Group Commander attendance at the MXG quarterly Low Observable (LO) Health of Fleet briefing.

**2.4. Maintenance Group Commander (MXG/CC) Responsibilities.** The MXG/CC (or equivalent) will: **(T-2).**

2.4.18.1. **(Added)** Ensure effective engine F119 Scheduled Engine Removal (SER) Forecast produced by Engine Management to level load Next Scheduled Depot Visit engines to alleviate fleet supportability limiting factors and sustain war ready engines.

2.4.60. **(Added)** Institute a standardized LO long lane REDUX flow plan with dedicated LO teams that maximizes efficiency and quality maintenance. (See **Attachment 18**)

2.4.61. **(Added)** Appoint fully qualified/experienced 7-level LO technicians to Quality Assurance (QA).

2.4.63. **(Added)** Establish a robust LO quality assurance program that includes focus on aircraft Outer Mold Line (OML) inspections and LO repair processes.

2.4.64. **(Added)** Review SAS audit trends at least monthly and implement corrective actions when margins exceed established limits (+/- 15%).

2.4.65. **(Added)** Support all MAJCOM directed Radar Cross Section (RCS) test events (e.g. SMP flight test, Radar Cross Section Test Facility (RCSTF), and unit level Radio Frequency (RF) assessments.

2.4.66. **(Added)** Provide proposed calendar year SMP dates and tentative aircraft tail numbers to ACC/A5A22 NLT the first day of each fiscal year.

2.4.67. **(Added)** Ensure hot wash/lessons learned are documented for each Theater Security Package (TSP) deployment and formal reports are shared with all F-22 units/MAJCOMs. Recommend release within 60 days of return to home station.

2.4.68. **(Added)** Be the approval authority for aircraft to fly more than three sorties in Aero Only configuration. If the MESL or mission dictates an NMC condition. Aero-only configuration renders an aircraft NMCM, unless the MESL dictates different for real world missions, therefore must be minimized to prevent an uncontrollable LO backlog.

2.4.69. **(Added)** Establish either weekly or daily home station OML inspection frequency.

2.4.70. **(Added)** Ensure APG and flightline specialists involved with OML inspections complete annual OML Damage Identification and Reporting Training (Course Code 22183).

2.4.71. **(Added)** Establish a quarterly LO Health of Fleet briefing.

2.4.72. **(Added)** Ensure MXS/AMXS Squadron MOO/Chief, AMU MOO/Chief, AMXS/MXS Production Superintendents, Fabrication Flight Chief, LO ASM Section Chief, and all scheduling personnel (2R1X1) attend Low Observable Maintenance Management Training.

2.4.72.1. **(Added)** Training course is required within 6 months of assignment to target group position in accordance with AFI 36-2650, **paragraph 1.8**, MAJCOM Mandatory Course Listing (MMCL).

2.4.72.2. **(Added)** Training course is Optional/Recommended for Group and Squadron CC and CCC.

**2.5. Deputy Maintenance Group Commander (MXG/CD) will:**

2.5.1.2.11. **(Added)** Review and monitor F119 Scheduled Engine Removal (SER) Forecast produced by Engine Management to level load Next Scheduled Depot Visit (NSDV) engines to alleviate fleet supportability limiting factors and sustaining war ready engines.

## Chapter 3

## AIRCRAFT MAINTENANCE SQUADRON (AMXS)

**3.5. Production Superintendent.**

3.5.2.1. **(Added)** Exceptional release authorities will complete the ER using the most current IMIS aircraft forms data. **(T-2).** If required, validate using IMIS server, but aircraft status from an undocked PMA may be used to determine status and airworthiness of the aircraft.

**3.6. Flightline Expediter.**

3.6.12. **(Added)** Inform MOC and Debrief Section of all ground aborts and spare aircraft usage. When a spare is used, ensure the Data Transfer Card (DTC) of the aborted aircraft is delivered to debrief section.

**3.7. Aircrew and Maintenance Debrief Section.**

3.7.13. **(Added)** Aircraft Sortie Debrief Requirements. **(T-2).** A debrief will include a micro Data Transfer Cartridge (*u*DTC) download to IMIS, aircraft interview, and job control number (JCN) creation as required. Aircraft sortie times will be tracked through *u*DTC download. This time is automatically calculated from Weight-Off-Wheels (takeoff) to Weight-On-Wheels (landing), plus 5 minutes or engine shutdown, whichever occurs first. In the event that an *u*DTC download fails, flight times will be entered manually by debrief personnel and JCNs will be created using the Crash Survivable Memory Unit (CSMU) data. Notify Air Force Mission Support System (AFMSS) personnel of failed *u*DTC download to evaluate serviceability of *u*DTC. Include *u*DTC download capture rates to Aircraft Structural Integrity Program (ASIP) manager in accordance with AFI 63-140, ACC SUP, *Aircraft Structural Integrity Program*. A debrief will occur at the termination of every sortie or when a sortie is aborted except under the following circumstances:

3.7.13.1. **(Added)** Hot pit operations. A debrief will be accomplished after the last hot pitted sortie for the same aircrew member.

3.7.13.2. **(Added)** Aircrew change. A debrief is not necessary when there is a change in aircrew due to aircrew reprioritization. Exception to this rule would be aircrew change following completion of a preceding sortie, such as aircrew change in between hot pits or a face to face swap.

3.7.13.3. **(Added)** Ground Aborted Sorties (step to spare). Aborted aircraft *u*DTCs must be recovered and delivered to debrief section for processing. Pilot stepping to a spare must use a spare/separate *u*DTC to capture accurate fault data for that aircraft. The maintainer who performed the red ball maintenance leading up to the abort will convey pilot remarks into JCN discrepancy in IMIS during aborted aircraft debrief action. The aborted aircrew member will confirm/edit comments of the aborted aircraft upon return from the sortie.

3.7.14. **(Added)** The MXG/CC and OG/CC may waive the *u*DTC download during a unit exercise/inspection. When waived, the same *u*DTC will be used for any subsequent sorties to capture all data from the flying day and will be downloaded at the end of the day.

3.7.15. **(Added)** A code-3 by *u*DTC alone: scenarios that use the same *u*DTC for multiple sorties such as; hot pits, cross country or waived sorties as cited above, will reflect appropriate

status based on pilot assessment at the completion of each sortie. Should a code-3 discrepancy/FRC present during *u*DTC download at debrief, it will be applied to the last sortie flown.

3.7.16. **(Added)** Equipment Availability: scenarios where a classified IMIS terminal or PMA are necessary, ensure a classified hard-drive containing the applicable tail number data is available and undocked prior to the flying day.

3.7.17. **(Added)** Notify production after aircrew debrief is completed on the IMIS server so that a forms update of the PMA hard drive may be accomplished.

3.7.17.1. **(Added)** Forms update via docking is not required between flights if landing status is code-1 or code-2.

3.7.17.2. **(Added)** A forms update is required if a sortie is debriefed code-3. The production superintendent may approve a review of the code-3 discrepancy on the IMIS workstation if update or dock/undock is not feasible. Any code-3 that has associated parametric data must be docked/undocked.

3.7.17.3. **(Added)** Manually entered JCNs on the undocked PMA must be reconciled with the JCN created out of debrief and cross-referenced to each other.

3.7.18. **(Added)** If IMIS is unable to read the *u*DTC or the aircrew is unable to provide the *u*DTC (i.e. ground abort for cross-country), debrief personnel will coordinate with the production superintendent to ensure the data for the CSMU and the comprehensive engine diagnostic unit (CEDU) are downloaded manually using the PMA no later than the end of the flying period. The downloaded information will be utilized to create a JCN that is specific to the (Fault Reporting Code) FRC via the IMIS function for "Process AT File."

3.7.19. **(Added)** If IMIS capability is not available to support debrief (i.e. cross-country, demo, evacuation), the aircrew will determine if the aircraft is airworthy IAW AFI 21-103_ACCSUP_ADD_BB, *Equipment Inventory, Status, and Utilization Reporting System/F-22A Minimum Essential Subsystem List (MESL).*

3.7.20. **(Added)** All discrepancies reported by a pilot, or presented to debrief through the IMIS debrief process, must have a JCN created. The use of informational notes or local tracker spreadsheets do not constitute discrepancy reporting. **(T-2).**

3.7.20.1. **(Added)** Existing JCNs must be updated with new data observed by aircrew during subsequent sorties.

3.7.20.2. **(Added)** A JCN narrative will include the type of FRC used, if manual or ADHOC, and thorough pilot comments. If a pilot reported discrepancy already exists in aircraft forms, the pilot must confirm the fault is the same as the existing JCN and provide updates and/or insights that may help in the fault isolation process of that JCN. ADHOC FRCs are only used as a last resort.

3.7.21. **(Added)** Ensure T.O. 1F-22A-6, *Aircraft Scheduled Inspection and Maintenance Requirements* is available during debriefing operations, reference special inspections after specific occurrences are followed as applicable.

3.7.22. **(Added)** Use the most current F-22 Aircraft Debrief FRC supplement list to facilitate debrief filtering decisions. The supplemental list is downloadable from FIN under released

products data. This list is used to determine validity of FRCs or pilot reported discrepancies presented during the debrief process.

3.7.23. **(Added)** Any FRC associated to a pilot reported discrepancy, regardless of inclusion on the supplemental list, or anomalous, will have a JCN created even if resolved by system reset/avionics restart by aircrew or ground maintenance.

3.7.24. **(Added)** System reconfigurations and/or cascading failures must have JCNs created, as do any inflight system performance degradations/failures that require pilot intervention to recover, such as avionics restarts and/or system resets. Refer to AFI 21-103_ACCSUP_ADD_BB.

3.7.25. **(Added)** Events created IAW **paragraph 3.7.22**. & **3.7.23**. will have an appropriate corrective action documented. **Note:** System reset or avionics restarts are considered appropriate corrective actions; in such cases, no further maintenance action is required.

3.7.26. **(Added)** A supplemental FRC (nuisance) that is not associated to a pilot comment may be ignored.

3.7.27. **(Added)** Routine servicing FRCs presented in debrief require JCN creation for recurrence trending, see table below for condition symbols for servicing FRCs.

**Table 3.4. (Added) Servicing FRCs.**

| FRC | NARRATIVE |
|---|---|
| 219109811 | PAO RESEVOIR LEVEL LOW |
| 219149811 | PAO RESEVOIR LEVEL LOW |
| 290000003 | SYSTEM 1 RESEVOIR LOW |
| 290000004 | SYSTEM 2 RESEVOIR LOW |
| 290060009 | SYSTEM 1 RSVR PRESS ACCUM LOW |
| 290060010 | SYSTEM 2 RSVR PRESS ACCUM LOW |
| 290060011 | SYSTEM 1 RSVR PRESS ACCUM LOW |
| 290060012 | SYSTEM 2 RSVR PRESS ACCUM LOW |
| 355060042 | RIGHT ABOS BOTTLE EMPTY (SERVICING) |
| 355060042 | LEFT ABOS BOTTLE EMPTY (SERVICING) |
| 490000033 | LOW APGS OIL LEVEL |
| 490000035 | APU OIL FILTER BYPASS |

3.7.28. **(Added)** Informational notes will not be used to report system malfunction(s). Appropriate system capability codes must be used to report all system performance degradation(s). If performance degradation(s) were experienced and subsequently resolved in air or upon recovery with system resets then Capability Code 9 should be used. Capability Codes

and Landing Status are not required to be the same. For example, Capability Code 9 for CNI Fail that was reset with no additional malfunctions may be debriefed Landing Status Code 1.

3.7.29. **(Added)** Repeat/Recur discrepancy consideration: nine-digit FRCs are not the lone determining factor for repeat or recur reporting. The same system/subsystem FRCs with similar consequences must be considered in the determination of repeat/recurs. For example, AMAD oil pressure discrepancies can generate either 46XX or 83XX LCNs or both; a supporting pilot comment would drive the repeat or recur. Any Capability Code used during debrief must be considered for Repeat/Recur reporting, debrief personnel will ensure repeat/recurs are identified in the discrepancy narrative in IMIS.

3.7.29.1. **(Added)** Debrief personnel will assess pilot comments and associated FRCs that constitute a repeat or a recur discrepancy that IMIS did not automatically identify.

3.7.30. **(Added)** Upon completion of the daily flying period, the debrief NCOIC or designated representative will verify data accuracy and reconcile discrepancies with PS&D to include resolution of uncompleted sortie data.

3.7.31. **(Added)** Prior to an aircraft sortie, debrief personnel will clear all unprocessed failure data by using the Process Failure Data utility on the IMIS work station. All FRCs will be processed through final screen and finalized without creating any JCNs.

3.7.32. **(Added)** Debrief will undock a classified PMA drive with all data prior to the first sortie of the day when there are circumstances that will hinder the use of an IMIS workstation (i.e. scheduled power outage).

3.7.33. **(Added)** If auto built in test (BIT) or manual FRCs are not available and ADHOC FRCs are used, a diagnostic health management/debrief deficiency report (DHM DR) should be generated through the product improvement manager to address the specific DHM/debrief filter deficiency.

3.7.33.1. **(Added)** Generate DHM DR, when pilots identify problems with debrief pilot questions presented during the debrief process.

3.7.33.2. **(Added)** When nuisance/anomalous FRCs are debriefed and correlated to valid pilot reported discrepancies with JCNs created, a DHM DR will be generated in Joint Deficiency Reporting System (JDRS) to capture the deficiencies.

3.7.33.3. **(Added)** If a master DR already exists, a new DR is not required, however, an update to the Master DR with new/additional information as applicable will be submitted.

3.7.33.4. **(Added)** Debrief will maintain a log of DHM DRs submitted through JDRS; the log will contain aircraft sortie date, sortie number, pilot name, pilot comments, and/or FRC details and JDRS submission date.

3.7.33.5. **(Added)** Generate a DHM DR when correlation or sympathetic filtering deficiencies are discovered including the presentation of several FRCs from the same system/subsystem for the same reported failure. For example, multiple radar drain module FRCs for one radar high power failure. Specific sortie data must be included to support engineering analysis.

**3.8. Aircraft Section.**

3.8.1.4. **(Added)** Validate and reconcile data integrity for APU, Turbine Power Module (TPM), and Air Recharge Compressors (ARC) during aircraft document reviews, to include a review of Automated History Event (AHE) and Type Maintenance Interval data integrity with PS&D.

3.8.1.4.1. **(Added)** Validate and reconcile data integrity for date of manufacture on APU IDEA/EED during aircraft document reviews.

**3.9. Specialist Section.**

3.9.2.1. **Note:** All reprogramming for PACER WARE, SERENE BYTE is performed by AFMSS and is generally transparent to maintainers. Actual on aircraft reprogramming will be accomplished automatically by the aircrew when the newly programmed DTC is installed with systems powered.

3.9.2.2. **(Added)** Verify currency of aircraft and maintenance information system software configuration management to include aircraft OFP, default mission loads, ERF and E-checklist.

3.9.2.3. **(Added)** Coordinate with AFMSS personnel and IMIS administrators to ensure accurate default mission load data is loaded to the IMIS server to include deployed locations for mass memory updates. Default mission data must include: file 469 GINS waypoint, 406 GINS almanac and 420 GPS maintenance keys. Updates must be loaded to affected aircraft before commencement of flying. Aircraft returning to home station must have default mission load data updated within 30 days.

3.9.2.4. **(Added)** Be responsible for tracking the number of days each assigned aircraft goes without 270 volts Communication/Navigation and Identification (CNI) power applied. Aircraft that exceed 15 days without power applied must have CNI batteries charged and/or CNI batteries removed for conditioning according to T.O. 1F-22A-6, **Table 2-1**; also see RST message 15-005. **(T-2).**

3.9.2.5. **(Added)** Manage the Automatic Back Up Oxygen System (ABOS).

3.9.2.5.1. **(Added)** Maintain equipment accounts and oxygen replenishment contracts for ABOS servicing as necessary.

3.9.2.6.2. **(Added)** Conduct servicing cart scheduled maintenance requirements as defined in T.O. 35D3-6-46-1, *Operation and Maintenance Instructions With Illustrated Parts Breakdown—Trailer, Oxygen Servicing, Type AF/M32R-3* and work cards T.O. 35-1-236WC-1, *Periodic Inspection, Non-Powered Aerospace Ground Equipment, Gas Generating and Dispensing Systems* located on IMIS B+ Technical Order Data (TOD) viewer.

3.9.2.7. **(Added)** Ensure ABOS bottle configuration management is maintained and date of manufacturing for all assigned ABOS bottles are tracked and forecasted for time change as defined in T.O. 1F-22A-6.

3.9.2.8. **(Added)** Assign a software administrator for the Advanced Diagnostic Integration Tool (ADIT) and Multiplex Bus Fault Isolation (MBFI) system.

3.9.2.8.1. **(Added)** Maintain copies of ADIT and MBFI authority to operate documents and Computer Program Identification numbers (CPIN) accounts for operating system downloads.

3.9.2.9. **(Added)** Monitor DHM performance after maintenance debrief activities.

3.9.2.10. **(Added)** Validate and reconcile data integrity for date of manufacture for ABOS bottles, aircraft batteries and fire bottle squibs during aircraft document reviews.

3.9.2.11. **(Added)** Appoint at a minimum one COMSEC Responsibility Officer (CRO) per unit.

3.9.2.11.1. **(Added)** CROs will maintain and account for all installed cryptographic modules (KOVs) and coordinate with the base COMSEC office for timely turn in of suspected/confirmed bad assets.

## Chapter 4

## MAINTENANCE SQUADRON (MXS)

**4.4. Accessories Flight.**

4.4.3.1.1.1. **(Added)** The Emergency Oxygen System (EOS) will be maintained by Egress personnel.

**4.8. Fabrication Flight.**

4.8.5.7. **(Added)** Establish a dedicated LO OML inspection team with a minimum of two qualified LO personnel for each assigned AMU.

4.8.5.7.1. **(Added)** Personnel rotation plan must ensure OML inspection team consistency and proficiency is retained at all times. Minimum 3 qualified personnel.

4.8.5.8. **(Added)** Audit results are briefed to Wing and MXG Leadership during LO HOF briefings. Audit results are also submitted to ACC/A5A22 LO SME and F-22 SPO annually using a format similar to **Attachment 16**.

4.8.5.9. **(Added)** Establish a Fleet Health Manager for each assigned AMU to analyze, plan, coordinate, schedule, and execute all aspects of LO maintenance.

4.8.5.9.1. **(Added)** Must be a highly qualified TSgt/MSgt 7-level assigned to this position for a minimum of one year, two years optimal. **(T-2).**

4.8.5.9.2. **(Added)** Establish, track and report SAS fleet health metrics.

4.8.5.9.3. **(Added)** The LO "maintenance margin" for each aircraft is determined via an OML inspection and use of a SAS (See **Attachment 19**). Report home station and deployed wing SAS averages to Wing leadership, applicable MAJCOM, ACC F-22 WST, ACC/A4MN LO SME, and the ACC/A5A22 LO SME each flying day in a format consistent with **Attachment 15.** SAS margin reporting must include possessed aircraft and deployed aircraft. **(T-2).** Deployed aircraft are reported separately, e.g. aircraft supporting contingencies or exercises.

4.8.5.9.4. **(Added)** Review RCS test data to assess compliance with established maintenance procedures and implement corrective actions to mitigate quality escapes.

4.8.5.10. **(Added)** Low Observable/Composite Repair Facility (LO/CRF) Manager.

4.8.5.10.1. **(Added)** Responsible for reporting facility operation deficiencies such as the Heating, Ventilation and Air Conditioning (HVAC) systems, compressed and breathing air systems, electrical systems, and plumbing and drainage systems in the LO/CRF and on assigned real property of the LO/CRF.

4.8.5.10.2. **(Added)** Perform tasks related to the overall management and operations of the LO/CRF, including energy management and equipment inventory.

4.8.5.10.3. **(Added)** Perform facility inspections to determine repair and maintenance requirements.

4.8.5.10.4. **(Added)** Ensure all measures are taken to maintain security accreditation of facility as required.

4.8.5.10.5. **(Added)** Submit facility work orders through Civil Engineering (CE) customer service. In cases of established/approved contract maintenance for facilities, contact contractor for emergency or out of cycle maintenance. This includes warranty repairs and maintenance required.

4.8.5.10.6. **(Added)** Track the completion of contractor and CE work orders. Maintain record of all work to include response time and time required until satisfactory completion of work.

4.8.5.10.7. **(Added)** Perform facility and safety inspections as required by technical orders and Air Force instructions.

4.8.5.10.8. **(Added)** Perform escort duties or provide escorts as needed for contract maintenance personnel within special access areas of the LO/CRF.

4.8.5.11. **(Added)** Low Observable Maintenance Scheduling.

4.8.5.11.1. **(Added)** The LO fleet health manager coordinates with the AMU production supers and PS&D to determine aircraft LO REDUX scheduling priority and timeline.

4.8.5.11.2. **(Added)** LO maintenance scheduling is determined by the aircraft SAS margin and specific damage type accumulation (**Attachment 17**).

4.8.5.11.3. **(Added)** A combat coded aircraft should be scheduled for a LO REDUX when the SAS margin is > 80% and creep/minor damages are the leading driver.

4.8.5.11.4. **(Added)** Minor/creep damage (2% or less) accumulation/flight hour is used to predict and schedule a long range LO REDUX.

4.8.5.11.5. **(Added)** Long lane LO maintenance should plan to have at least four touch labor workers per shift at all times to ensure maximum efficiency.

4.8.5.11.6. **(Added)** LO personnel assigned to a long lane should not be removed for other priorities without a replacement technician of equal qualification.

4.8.5.11.7. **(Added)** LO maintainers are assigned to work and complete daily goals to ensure maximum efficiency.

4.8.5.11.8. **(Added)** An LO maintenance flow plan must be established and followed to ensure the aircraft is completed on schedule. **(Attachment 18)** can be used as a guide or locally created maintenance flows can be used.

4.8.5.11.9. **(Added)** Moderate damages (2% - 19.9%) are typically repaired during opportunistic maintenance.

4.8.5.11.10. **(Added)** Spikes damages (20% or greater) require immediate repair during the next down time.

4.8.5.11.11. **(Added)** Units may define spikes as >10% if necessary to control spike growth.

4.8.5.11.12. **(Added)** A short lane LO Redux is scheduled when an aircraft SAS margin is primarily driven by moderate and spike damages that will impact mission readiness and/or to control fleet SAS margin growth.

4.8.5.11.13. **(Added)** Hangar doors will not be opened during LO maintenance if it will impact environmental, safety, and health controls and/or LO repair cure times.

4.8.5.12. **(Added)** F-22 Signature Assessment System/Outer Mold Line (SAS/OML) Inspections.

4.8.5.12.1. **(Added)** The recommended fleet SAS margin average for combat coded aircraft during peacetime operations is ≤ 60 percent. This SAS margin average is based on ACC/A9 analysis of the requirements to meet Deployment Operational Capability (DOC) timing and to enable sustained combat operations. A fleet margin average ≤ 60 percent has also proven to be effective in sustaining a balanced scheduling battle rhythm during daily flying operations.

4.8.5.12.2. **(Added)** All aircraft scheduled to support a Theater Security Package and/or contingency deployment must not have an audit due within 30 days of arriving at the deployed location. **(T-2).**

4.8.5.13. **(Added)** Repair Verification Radar (RVR).

4.8.5.13.1. **(Added)** The RVR is maintained as special test equipment. This equipment is used by qualified Field Service Engineers (FSE), AFETS personnel, and at the Units discretion, skilled LO Technicians (7-lvl) are allowed to use and perform RVR checks and analysis.

4.8.5.13.2. **(Added)** The LO IPT will direct an RVR assessment for non-standard repairs and/or defects not characterized in SAS. **(T-2).**

4.8.5.13.3. **(Added)** RVR of the Integrated Forebody (IFB) tip is required when moisture intrusion is suspected and/or if nose cap/rain erosion coating damage exposes the composite substrate. **(T-2).**

4.8.5.13.4. **(Added)** The unit may direct RVR assessments to verify LO repair TOD compliance. This should be limited to minimize flying mission impacts. **Note:** RVR will not be used to independently replace SAS damage/repair values.

4.8.5.14. **(Added)** Acceptance Test Facility.

4.8.5.14.1. **(Added)** Combat coded aircraft scheduled for major depot maintenance will undergo a five day post depot RCS test in the RCS test facility (turntable) at OO-ALC once the facility is operational. **(T-2).**

4.8.5.14.2. **(Added)** Aircraft subject to RCS turntable testing will be SAS compliant unless directed otherwise by lead MAJCOM. **(T-2).**

4.8.5.15. **(Added)** Signature Management System RCS Flight Test.

4.8.5.15.1. **(Added)** The minimum requirement for combat coded aircraft is one aircraft/squadron/year. Reference ACC/A5A22 coordinated MOA.

4.8.5.15.2. **(Added)** Aircraft are scheduled to deploy to Edwards AFB for 12 days (Monday through the following Friday).

4.8.5.15.3. **(Added)** Aircraft must be SAS and ESAS compliant throughout the entire flight test event. **(T-2).**

4.8.5.15.4. **(Added)** Any deviation from the minimum number of aircraft required to support SMP will require a formal waiver request from the WG/CC to ACC/A3. **(T-2).**

4.8.5.15.5. **(Added)** Additional RCS testing may be required to obtain traceability of significant RCS growth in a critical sector, to include flight test on the range, RCS test facility, or RVR. LO

engineers in coordination with ACC/A5A22 and ACC/A4MN will determine the method of testing when the RCS status of an aircraft is unknown. **(T-2).**

**4.11. Propulsion Flight.**

4.11.1.15.1.1.1. **(Added)** Utilize visual aids to ensure a smooth flow of scheduled engine shop visits in an effort to level load maintenance and balance flight workload capacity and capabilities.

4.11.1.15.1.1.1.2. **(Added)** The Propulsion Flight Chief or delegate will attend weekly and monthly MXG maintenance planning meetings.

## Chapter 5

## MAINTENANCE OPERATIONS

5.2.5. **Maintenance Management Analysis (MMA).**

5.2.5.3.2.2. **(Added)** Approve and publish guidance on IMIS to IMDS interface error corrections developed by MMA.

5.2.5.3.2.3. **(Added)** Approve and publish guidance on IMIS to IMDS configuration management corrections and procedures developed by PS&D.

## Chapter 6

## QUALITY ASSURANCE (QA)

**6.3. QA Superintendent Responsibilities.**

6.3.2.1. **(Added)** Ensure locally established MSEP assures the integrity of LO maintenance and SAS documentation associated with mission capable status reporting. This includes frequent personnel evaluations of aircraft OML inspections, SAS documentation and LO repair processes IAW established technical order guidance.

**6.5. Quality Assurance Inspector Responsibilities.**

6.5.7. **(Added)** Support maintenance information system configuration control. Configurable support systems that reside in IMIS are necessary to ensure safety of flight for assigned aircraft and sound maintenance practices. Routine Inspection List items should include inspections of configuration control of ERF, TOD release, electronic checklist version, IMIS, LORDS, aircraft OFPs and advanced engine failure resolution (AEFR) and mission default data.

6.5.8. **(Added)** LO Inspector Responsibilities.

6.5.8.1. **(Added)** Ensure a focused effort on process compliance to mitigate quality escapes that could impact RCS.

6.5.8.2. **(Added)** Assist in developing a highly skilled LO workforce with proactive oversight and guidance.

6.5.8.3. **(Added)** Update Wing leadership on LO maintenance quality and potential improvement areas during the Health of Fleet (HoF) brief if applicable.

## Chapter 7

## IMPOUNDMENT PROCEDURES

**7.5. Mandatory Impoundments.** Aircraft and/or equipment will be impounded:

7.5.5.1. **(Added)** For any uncommanded/inadvertent weapon station extensions.

7.5.12. **(Added)** For any known contamination such as gaseous oxygen, fuel, hydraulic fluid, PAO, or oil.

## Chapter 11

## ADDITIONAL MAINTENANCE REQUIREMENTS AND PROGRAMS

### 11.7. Maintenance Recovery Team (MRT).

11.7.1.1. **(Added)** The concept of operating and maintaining the F-22 requires the ability to be sustained remotely from home station support. Every aircraft, engine, work center, or person is tied in the maintenance information system to a specific organization; data cannot cross organizations without data transfer processes occurring between operating units. Maintenance data documentation is completed either through home station supported IMIS server, transferred aircraft data to the server, or on paper forms. Pilots flying F-22 cross country sorties will be provided PMA hard disk drive with aircraft forms, configuration, and support data loaded in the event of unscheduled maintenance requirements. IMIS admins provide a sealed envelope for the pilot to carry with deployment administrative account information (account username and password) that could be utilized by a trained IMIS administrator if they are not from the same unit as the deployed aircraft. The envelope includes home station IMIS administrator contact information with instructions to contact if username and passwords are used to ensure account integrity.

11.7.1.2. **(Added)** Maintenance is accomplished using authorized TOD utilizing the PMA. The only exception to using a PMA will be in support of F-22 operations at non F-22 supported transient airfields. In such cases, the T.O. 1F-22A-2-1-1, *Cross Servicing Manual* can be used along with AFTO Form 781A, *Maintenance Discrepancy and Work Document* and AFTO Form 781K, *Aerospace Vehicle Inspection, Engine Data, Calendar Inspection and Delayed Discrepancy Document* for maintenance data documentation. Aircraft status and consumable servicing requirements are verified by cockpit controls and displays by the pilot. F-22s requiring unscheduled maintenance actions outside of routine serving and turnaround actions are performed by a qualified MRT.

11.7.1.3. **(Added)** PMA/TOD drive usage may be used for routine servicing and turnaround requirements at the discretion of the MXG/CC to support time sensitive generation and deployment launch operations. PMA/TOD drive usage may also be used during divert or enroute maintenance actions. All maintenance activity must be documented on AFTO Form 781A/K for reconciliation once the aircraft reaches its destination. **(T-2).** Aircraft status and consumable servicing requirements are verified by cockpit controls and displays by the pilot. F-22s requiring unscheduled maintenance actions outside of routine serving are performed at the discretion of the host MXG/CC (if applicable) and in agreement with the owning MXG/CC with the support of resident F-22 maintainers or an MRT as necessary.

11.7.1.4. **(Added)** Diverted aircraft to an existing F-22 operating location that requires unscheduled maintenance and the pilot has a functional DTC and PMA hard drive with loaded aircraft forms, configuration and support data: IMIS admins load host maintainers man numbers and privilege data to the PMA hard drive to support maintenance repair documentation. Host unit IMIS admins and advanced program office (APO) convey applicable personnel data used to support off station F-22 maintenance requirements to their counterparts at the owning unit. Personnel data of maintainers who performed maintenance actions at the stopover location may be temporarily gained to the owning IMIS database prior to PMA hard drive dock/undock. Once

transfer and reconciliation is complete, the temporary addition of the personnel data should be deleted. Aircraft remaining at a host operating location for an extended period should have a complete transfer of aircraft data to support dock/undock activity as well as necessary updates.

11.7.1.5. **(Added)** Deployment of maintainers to perform maintenance activities on a sister unit's F-22 either at the unit of assignment or off-station.

11.7.1.5.1. **(Added)** Maintainers intending to perform maintenance activities on other unit's assigned F-22 aircraft should coordinate with home-station and sister unit IMIS admins, Database Managers (DBM) and APOs to ensure temporary loss/gain of personnel data transfer between home-station and sister unit operating locations.

11.7.1.5.2. **(Added)** IMIS administrators at the gaining location load maintainer personnel data to a ghost "visiting" IMIS account to facilitate cross work center organizational maintenance authority; timely pre-coordination between APOs is critical to alleviate security delays.

## Chapter 15

## MAINTENANCE PLANS, SCHEDULING AND DOCUMENTATION (PS&D)

**15.4. Engine Management (EM).**

15.4.1.1.1.1. **(Added)** Assess engine fleet health through use of visual aids at a minimum monthly, preferably weekly during maintenance planning meetings.

15.4.1.2.4.1. **(Added)** Engine Cycle Management. Track total cycles for the F-119 engines. **https://intelshare.intelink.gov/sites/561jts/afttp/aircraft_maintenance/SitePages/Home.aspx**

15.4.1.2.20.1.1. **(Added)** If IMDS-CDB and CEMS are unavailable for more than 48 hours at home station or while deployed all MXG work-centers will use IMIS until IMDS-CDB and CEMS become available. IMIS has the ability to store approximately a 2 week period of data without IMDS updating, allowing the use of IMIS to continue until such time as IMDS-CDB and CEMS become available.

JEFF KING, Brig Gen, USAF
Director of Logistics, Engineering,
and Force Protection

**Attachment 1**

**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION**

***References***

AFI 21-101, *Aircraft and Equipment Maintenance Management*, 21 May 2015

AFI 21-101, ACC SUP, *Aircraft and Equipment Maintenance Management*, 19 April 2017

AFI 21-103, ACC SUP Addendum BB, *Equipment Inventory, Status, and Utilization Reporting System/F-22A Minimum Essential Subsystem List (MESL),* 7 November 2013

AFI 63-140, ACC SUP, *Aircraft Structural Integrity Program,* 27 April 2015

AFMAN 33-363, *Management of Records*, 1 Mar 2008

T.O. 00-25-107, *Maintenance Assistance*, 1 October 2015

T.O. 1F-22A-2-1-1, *Cross Servicing Manual*, 19 April 2017

T.O. 1F-22A-6, *Aircraft Scheduled Inspection and Maintenance Requirements*, 26 January 2017

T.O. 35D3-6-46-1, *Operation and Maintenance Instructions with Illustrated Parts Breakdown—Trailer, Oxygen Servicing, Type AF/M32R-3,* 22 July 2015

T.O. 35-1-236WC-1, *Periodic Inspection, Non-Powered Aerospace Ground Equipment, Gas Generating and Dispensing Systems*, 21 July 2017

***Adopted Forms***

AF Form 847, *Recommendation for Change of Publication*

AFTO Form 781A, *Maintenance Discrepancy and Work Document*

AFTO Form 781K, *Aerospace Vehicle Inspection, Engine Data, Calendar Inspection and Delayed Discrepancy Document*

***Abbreviations and Acronyms***

**ABOS**—Automatic Back Up Oxygen System

**ADIT**—Advanced Diagnostic Integration Tool

**AEFR**—Advanced Engine Failure Resolution

**AFE**—Aircrew Flight Equipment

**AFETS**—Air Force Engineering and Technical Service

**AFMSS**—Air Force Mission Support System

**AHE**—Automated History Event

**AMAD**—Airframe Mounted Accessory Drive

**AME**—Alternate Mission Equipment

**APGS**—Auxiliary Power Generation System

**APO**—Automated History Event

**APU**—Auxiliary Power Unit

**AR**—Action Requests

**ARC**—Air Recharge Compressor

**ASIP**—Aircraft Structural Integrity Program

**BIT**—Built-In Test

**CDA**—Commercial Derivative Aircraft

**CEDU**—Comprehensive Engine Diagnostic Unit

**CNI**—Communication/Navigation and Identification

**CPIN**—Computer Program Identification Number

**CRF**—Composite Repair Facility

**CRO**—COMSEC Responsibility Officer

**CSMU**—Crash Survivable Memory Unit

**DBM**—Database Manager

**DHM**—Diagnostic Health Management

**DOC**—Deployment Operational Capability

**DR**—Deficiency Report

**DTC**—Data Transfer Card

**EOS**—Emergency Oxygen System

**ERF**—Event Relationship File

**FIN**—Field Information Network

**FRC**—Fault Reporting Code

**FSE**—Field Service Engineers

**GINS**—Global Inertial Navigation System

**GPS**—Global Positioning System

**HoF**—Health of Fleet

**HVAC**—Heating, Ventilation and Air Conditioning

**IDEA**—Innovation Development through Employee Awareness

**IFB**—Integrated Forebody

**IMDS**—Integrated Maintenance Data System

**IMIS**—Integrated Maintenance Information System

**IPT**—Integrated Product Team

**JCN**—Job Control Number

**JDRS**—Joint Deficiency Reporting System

**LCN**—Load Classification Number

**LO**—Low Observable

**LORDS**—Low Observable Repair Data System

**MBFI**—Multiplex Bus Fault Isolation

**MESL**—Mission Essential Subsystem Lists

**MIS**—Maintenance Information Systems

**MMA**—Maintenance Management Analysis

**MOA**—Memorandum of Agreement

**MRT**—Maintenance Recovery Team

**MSEP**—Maintenance Standardization & Evaluation Program

**MSW**—Maintenance Server Workstation

**NDI**—Nondestructive Inspection

**OFP**—Operational Flight Program

**OML**—Outer Mold Line

**PIM**—Product Improvement Manager

**PMA**—Portable Maintenance Aid

**PAO**—Polyalphaolephin

**RCS**—Radar Cross Section

**RCSTF**—Radar Cross Section Training Facility

**RF**—Radio Frequency

**RST**—Raptor Support Team

**RSVR**—Reservoir

**RVR**—Repair Verification Radar

**SAS**—Signature Assessment System

**SME**—Subject Matter Expert

**SMP**—Signature Management Program

**STE**—Special Test Equipment

**TO**—Technical Order

**TOD**—Technical Order Data

**TODO**—Technical Order Distribution Office

**TPM**—Turbine Power Module

**TSP**—Theater Security Package

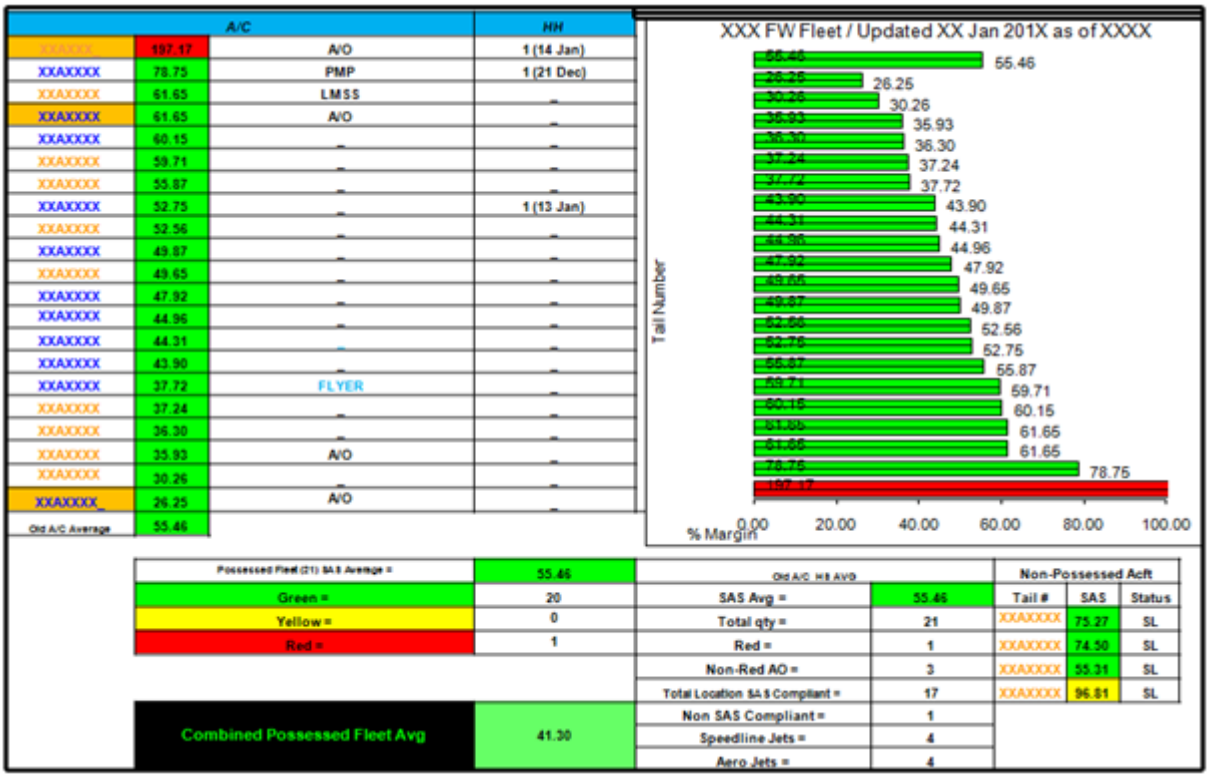
**WST**—Weapon System Team

## Attachment 11 (Added)

## SAS REPORTING METRICS

**A11.1. SAS Reporting Metrics.** Fleet SAS margin numbers must be documented in a format similar to the chart below (**Figure A11.1**). Key information includes SAS margin number for each aircraft, wing SAS average.

**Figure A11.1. SAS Reporting Metrics.**

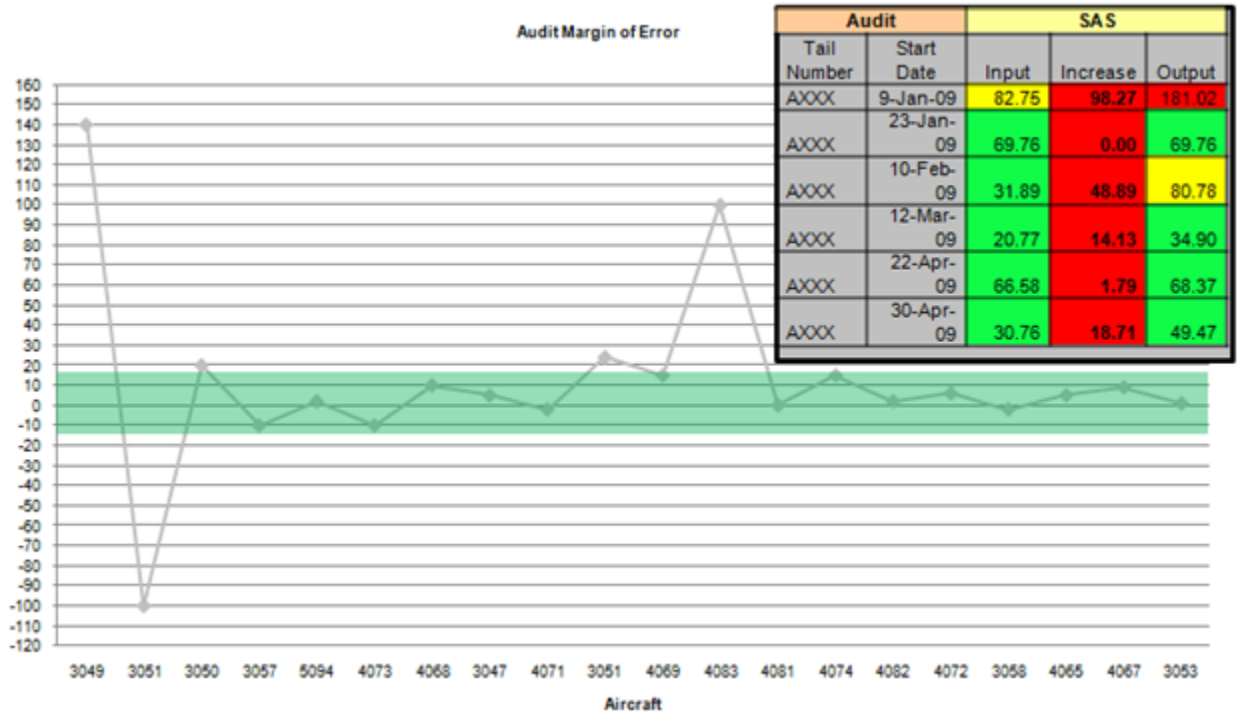


## Attachment 12 (Added)

## F-22 OUTER MOLD LINE (OML) AUDIT

**A12.1. F-22 Outer Mold Line (OML) audit.** The LO Section is responsible to perform a SAS and aircraft OML audit on each assigned aircraft annually. The audit is used to confirm that damage defects entered in the SAS during daily OML inspections or damages removed from SAS during routine maintenance provide for an accurate representation of the LO system health. Therefore, must be completed by separate entity within the LO section, excluding OML team members. This can only be performed by physically matching aircraft damages with the entries in SAS. Errors identified during the audit must be recorded in the audit historical file and corrected in the SAS immediately. Any aircraft audit that results in a +15% or -15% SAS margin deviation indicates a potential deficiency with the OML inspection process. Maintenance supervisors with direct oversight of LO processes must ensure significant variances are understood and corrective actions, e.g. training, additional QA oversight, process changes, etc. immediately follow. Internal root cause analysis and corrective actions must be documented for historical purposes any time an audit exceeds the margin percentages outlined above. **Note:** There is an unacceptable risk to aircraft radar cross section and aircraft survivability due to substandard maintenance practices or inaccurate maintenance documentation into the SAS. Aircraft scheduled for an audit should be identified during the monthly/weekly shared resources meeting.

**Figure A12.1. Sample Audit Metric.**

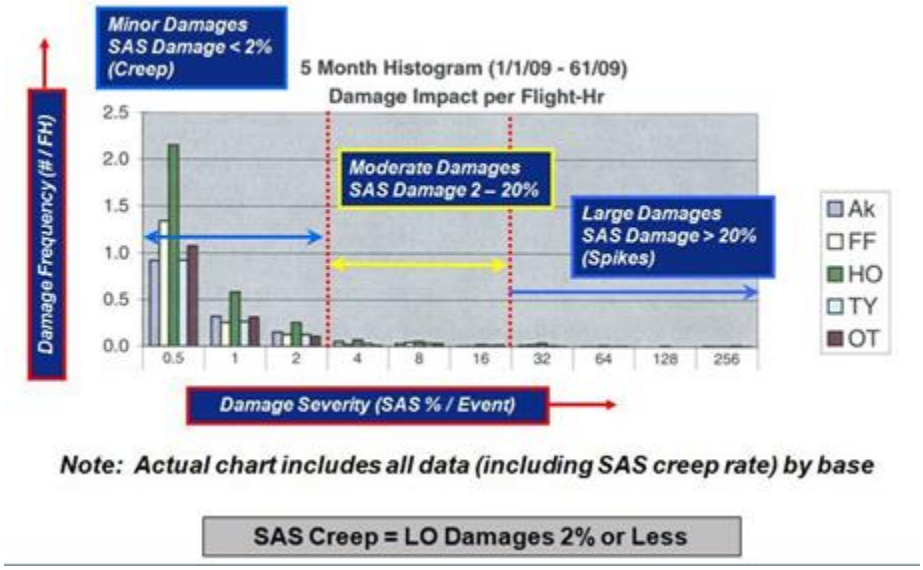



| Audit | | SAS | | |
|---|---|---|---|---|
| Tail Number | Start Date | Input | Increase | Output |
| AXXX | 9-Jan-09 | 82.75 | 98.27 | 181.02 |
| AXXX | 23-Jan-09 | 69.76 | 0.00 | 69.76 |
| AXXX | 10-Feb-09 | 31.89 | 48.89 | 80.78 |
| AXXX | 12-Mar-09 | 20.77 | 14.13 | 34.90 |
| AXXX | 22-Apr-09 | 66.58 | 1.79 | 68.37 |
| AXXX | 30-Apr-09 | 30.76 | 18.71 | 49.47 |

## Attachment 13 (Added)

## DAMAGE TYPE DEFINITION

**Figure A13.1. Damage Type Definition.**




*Note: Actual chart includes all data (including SAS creep rate) by base*

**SAS Creep = LO Damages 2% or Less**

## Attachment 14 (Added)

## SAMPLE LO REDUX FLOW PLAN

**A14.1. Sample LO redux flow plan.** The LO section must establish a LO maintenance flow plan for each long lane maintenance action of five or more days. The flow plan will help keep the aircraft maintenance schedule focused on the expected completion time.

**Table A14.1. LO Maintenance Flow Plan.**

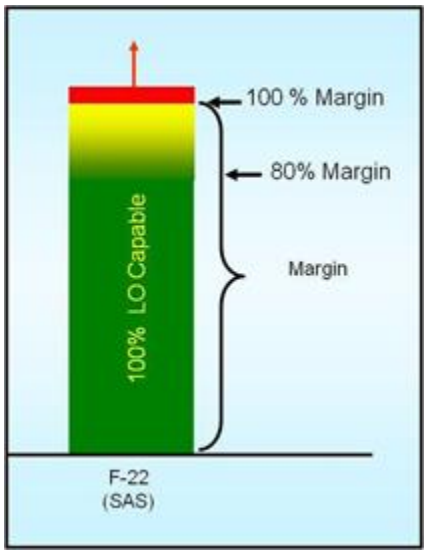
| **Calendar Days** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | |
| **Production Day** | 1 | 2 | 3 | 4 | 5 | | | 6 | 7 | 8 | 9 | 10 | | | 11 | 12 | 13 | 14 | 15 |
| | | | | | | | | | | | | | | | | | | | |
| **Gap Filler Install FIP Casting** | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **L04 Application / Top Primer Application** | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **Boot / Butter / L07 Type C / Flex primer** | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **Topcoat** | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| **Touch Up / Panel Closure and Install** | | | | | | | | | | | | | | | | | | | |

## Attachment 15 (Added)

## SAS MARGIN DEFINITION

**A15.1. SAS Margin Scale.** The graphic below (**Figure A15.1**) depicts the SAS margin scale used to determine mission capable status for the F-22 LO system.

**Figure A15.1. SAS Margin Definition.**




A15.1.1. The LO "maintenance margin" for each aircraft is determined via an OML inspection and use of a SAS. An aircraft is fully mission capable for the LO system when the SAS margin is less than or equal to 100 percent. LO restoration is required when 100 percent SAS margin exceeded. Refer to the F-22 Mission Essential Systems List for LO status reporting.

A15.1.2. The desired fleet and/or aircraft signature margin is one that enables the unit to meet its DOC statement. Maintaining a fleet SAS margin average at or below 60 percent during peace time operations will enable combat coded units to meet its DOC statement without requiring additional maintenance prior to deployment. Any individual aircraft that is at or exceeds 80% of its SAS margin should be a priority for the next scheduled LO restoration.

A15.1.3. SAS does not rank order aircraft in terms of RCS.

A15.1.4. SAS number does not correlate to an RCS pattern.

A15.1.5. SAS is not a mission planning tool.

A15.1.6. OML inspections used to determine SAS margins may be accomplished daily or weekly by LO qualified signature management teams using procedures outlined in technical order data. Combat coded units using a weekly OML inspection process must revert to a daily inspection during contingency operations. If a unit is using a weekly OML inspection, trained/qualified crew chiefs accomplish coating evaluations during postflight inspections daily. The crew chief role is to identify and report major LO discrepancies that pose a safety of flight risk, as to prevent propagation if unrepaired, and could jeopardize aircraft mission capable status for LO. Unit AFETS personnel are responsible for establishing and maintaining a robust APG training plan for weekly OML inspections.

## Attachment 16 (Added)

## F-22 SIGNATURE MANAGEMENT PROGRAM

**A16.1. F-22 Signature Management Program.** Annex B to the Operational Requirements Document CAF 304-83-I/II/IIIA F-22 Advanced Tactical Fighter states "A measurement program shall be developed to sample the dynamic RCS upon initial F-22 delivery and throughout the service life of the aircraft. The number of aircraft assessed and allowable variation from established standards should provide 90% confidence that the F-22 RCS requirements are met across the remainder of the F-22 fleet." This ORD requirement is partially fulfilled via annual Signature Management Program (SMP) open air testing with one combat coded aircraft/squadron/year deployed out of Edwards AFB. Aircraft SAS margins must remain compliant throughout SMP testing. Due to limited range accessibility for the Raptor fleet, fleet size, scheduling, and funding constraints, the F-22 program is not able to dynamically measure an adequate number of aircraft via SMP. Either pre or post depot testing in the OO-ALC/Marietta RCSTF is required to fulfill this requirement. All aircraft tested will be SAS compliant. Units must plan for either a pre or post depot 5 day RCSTF measurement of all aircraft scheduled to undergo major depot maintenance at Palmdale or OO-ALC. Aircraft tested pre depot do not require a post depot measurement. The scheduled 5 day RCSTF timeline will not be exceeded without approval of the owning unit MXG/CC. The RCSTF will also be used to further assess SMP point outs if required to obtain traceability of significant RCS growth in a critical sector. All aircraft scheduled for RCSTF measurements will be placed in depot status once the aircraft lands at the test location. Units are required to send one 7-level crew chief to assist with RCSTF drop-in pre/post measurement activities and forms maintenance. The RCSTF is limited to the near field spectrum and +/- 5 degrees in elevation whereas SMP provides more accurate far field measurements in critical threat aspects.

**Figure A16.1. Marietta RCSTF.**

**A16.2.** LO Repair Verification Radar.

A16.2.1. The LO RVR is currently special test equipment (STE) for the F-22 and its purpose is to measure the signature performance of LO repairs and damages in a zonal area.

A16.2.2. RVR is utilized to:

A16.2.2.1. Detect non-visual anomalies.

A16.2.2.2. Ensure repair performance and provide feedback to the maintainer/Depot.

A16.2.2.3. Define impacts of unique LO damages not identified in SAS.

**Figure A16.2. Repair Verification Radar.**