

S7

**Engineering
Support**



ENGINEERING SUPPORT



S7 Technics engineers have extensive experience in aircraft engineering support

Maintaining airworthiness of aircraft

- Continuing airworthiness of aircraft
- Development and support of Maintenance Program (MP)
- Reliability program, optimization of Maintenance Programs
- Tracking Airworthiness Directives (ADs), Service Bulletins, modification status
- Tracking component status – HT, LLP, OCCM
- Tracking structural repair status
- Tracking engine and Auxiliary Power Unit (APU) status – AD, SB, LLP
- Monitoring aircraft engine parameters, developing corrective actions
- Management, recording and storage of aircraft technical records
- Development of job cards and other technical documentation

Other

- Engineering support during aircraft maintenance
- Aircraft storage programs
- Internal DOA (Design Organization Approval) holder
- Development and support of Minimum Equipment List (MEL)
- Development and engineering support for special procedures: test flight, weighing, and others
- Consulting on aircraft acceptance and entry into service, redelivery to Lessor. Participation in aircraft acceptance and redelivery up to turnkey projects
- Aircraft and documentation inspection. Preparation of discrepancy list with suggestions for rectification
- Assistance in obtaining State Aircraft Registration Certificate, Airworthiness Certificate, Noise Certificate, Radio Station Permit
- Services for lessors

DATA MIGRATION TO IS, DATA PREPARATION, IT SUPPORT

Digitization and systematization of technical records

Preparation of data in required format for migration to new Information System (IS)

Data testing and validation

Preparation and programming of required reports

Implementation of algorithms, methods and procedures for transition to new IS

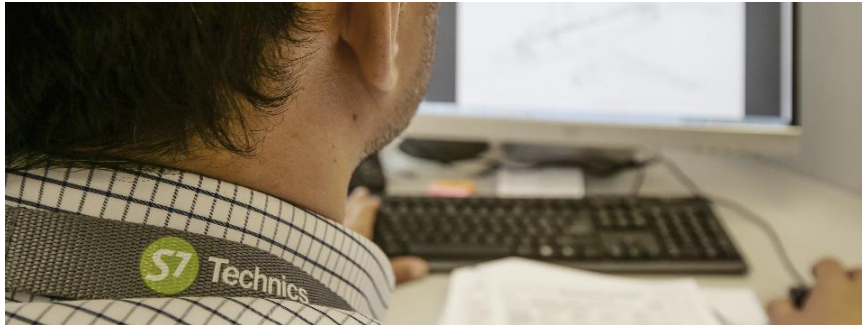
Organization and support of new IS adoption for aircraft continuing airworthiness and maintenance



DEVELOPMENT AND SUPPORT OF MAINTENANCE PROGRAM



- Development of Maintenance Program based on Aircraft Manufacturer recommendations and in accordance with Aviation Authority requirements
- Incorporation into MP of special aircraft operating conditions and accumulated operational experience to achieve maximum flight hours and optimize maintenance costs
- Incorporation into MP of ETOPS requirements (configuration and additional maintenance requirements)
- Incorporation into MP of ICA (Instructions for Continued Airworthiness) requirements for major modifications
- MP revision development based on:
 - MP effectiveness analysis performed under the reliability program (at Customer's request);
 - Changes to Aircraft Manufacturer documentation (MPD, CMM, other);
 - Customer's operational experience.
- Development of Russian-language version of MP for aircraft registration with Russian Federal Air Transport Authority (FATA)
- Input of the MP into AMOS IS



RELIABILITY PROGRAM FOR VARIOUS AIRCRAFT TYPES AND MAINTENANCE PROGRAM OPTIMIZATION

- Collection and analysis of statistics on defects detected during fleet operation
- Establishing control thresholds for statistical exceedance of defect count – UCL (Upper Control Limit). Monitoring exceedance of these thresholds. Data analysis to identify causes of threshold exceedance. Determining root causes and developing proposals for Customer to reduce defect count
- Preparation and submission of monthly reliability reports demonstrating a wide range of operational parameters for Customer's fleet
- Evaluation of MP effectiveness based on collection of statistical defect data linked to MP items
- Initiating and participating in Customer's reliability group meetings. Reporting on work performed, participating in decision-making on corrective actions based on reliability program findings



TRACKING AD, SB, MODIFICATION STATUS

- Establishing status of Airworthiness Directives (AD), Service Bulletins (SB), modifications based on available information/documentation on work performed on the aircraft
- Analysis of new ADs, SBs, modifications
- Preparation of Engineering Coordination Sheets (ECOS) with recommendations to Customer on method and timing of work execution
- Development of proposals for alternative method of compliance with AD, SB, modification requirements in case of difficulties with original solutions, together with the in-house FAP-21J organisational unit
- Obtaining approved ECOS from Customer. Data entry into AD, SB, modification status (AMOS IS)
- Development of work instructions (cards) for modifications and inspections
- Receiving completed DFP (Documented Form of Performance), marking work completion in AD, SB, modification status
- Provision of periodic reports to Customer in the form of current AD, SB, modification status



TRACKING COMPONENT STATUS – HT, LLP, OCCM

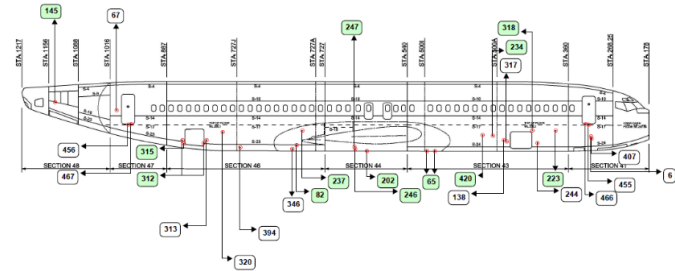
- Creation of aircraft configuration templates, engine, APU, landing gear assemblies (to the extent required by Customer) in accordance with Manufacturer's documents and aircraft operational history
- Maintaining configuration of aircraft and components with limited life, service life and on-condition status in any record-keeping IS to generate a complete list of component statuses
- Maintaining and restoring an up-to-date database on aircraft and component utilization in flight hours, flight cycles and calendar life in accordance with the aircraft MP
- Recording component replacements in aircraft, Engine, APU, Landing Gear configuration on an ongoing basis, and tracking component movement from delivery, issue, and installation on aircraft
- Maintaining an archive of installed and replaced components (for each aircraft)
- Preliminary verification of accompanying documentation for components planned for purchase or coming from repair for compliance with MP, CMM, lease agreement requirements
- Monitoring remaining life and service life of components installed on aircraft in accordance with Customer's MP requirements to ensure maintenance service planning
- Scheduling component replacement according to remaining life and informing Customer of requirements
- Assignment of repair and/or inspection program for components removed from aircraft based on MP requirements and component remaining life
- Monitoring warehouse storage periods of components
- Support of basic aircraft maintenance forms in Customer's IS
- Support of component replacement in Customer's IS during servicing in the company's repair units
- Participation in aircraft Delivery/Redelivery projects. Maintaining currency and providing reports on components:
 - HTC/ OCCM status;
 - Avionics list;
 - Engine / APU component status;
 - APU Utilization report for period;
 - LG LLP status;
 - Removal / Installation list;
 - AC Summary report.

TRACKING STRUCTURAL REPAIR STATUS

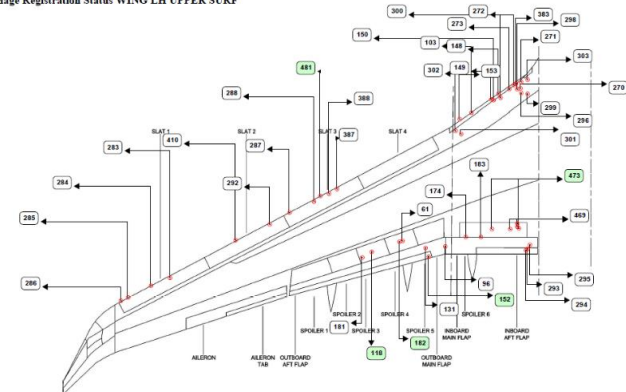


- Maintaining aircraft repair status in AMOS IS
- Visual separation of allowable damage and repairs on aircraft image
- Extensive filter capabilities in AMOS IS for on-screen (or print) display of:
 - only allowable damage;
 - only repairs;
 - only lightning strikes;
 - any part of aircraft, fuselage, wing, empennage, components (as above);
 - sorting by damage/repair type.ремонта.
- Recording damage on components, e.g., Inlet Cowl, Radome, Thrust Reverser, etc., including when transferring them between aircraft
- Creating a folder for each damage/repair to store provided documentation with ability to access this documentation from anywhere at any time (provided a PC/laptop with AMOS IS installed)
- Creating cards for repair work on aircraft and structural elements
- Creating periodic inspection cards to track and schedule required inspections of damage/repairs

Aircraft Damage Registration Status FUSELAGE RH



Aircraft Damage Registration Status WING LH UPPER SURF



TRACKING ENGINE AND APU STATUS – AD, SB, LLP

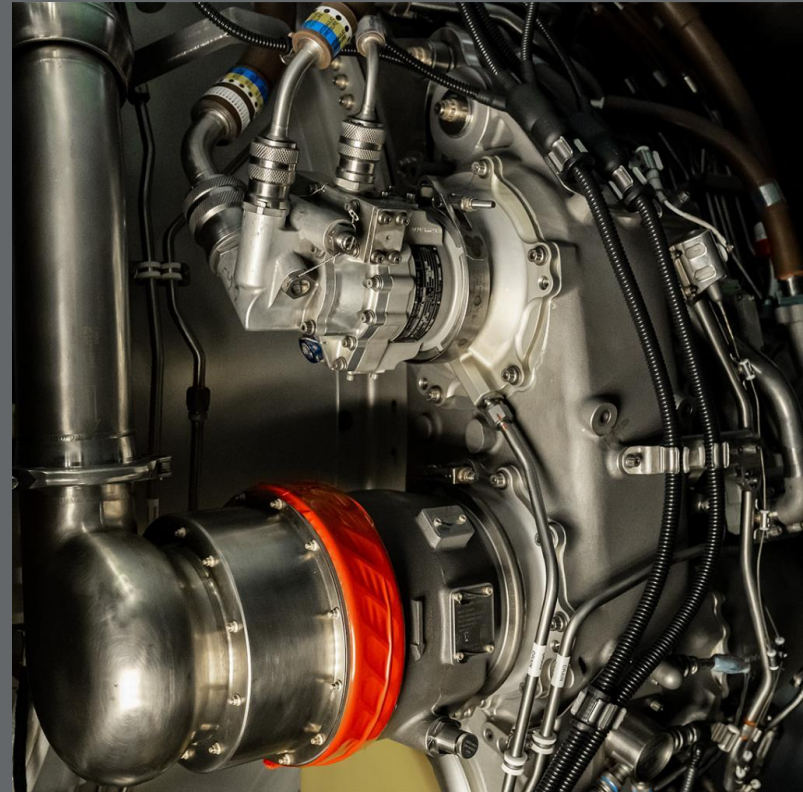
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The S7 Technics Engineering Center is capable of performing the full range of tasks for continuing airworthiness of aircraft engines and auxiliary power units (APU) in terms of tracking status of Airworthiness Directives (AD), Service Bulletins (SB), as well as their Life-Limited Parts (LLP)

Maintaining aircraft airworthiness depends on timely implementation of AD, SB requirements, as well as manufacturer documentation limiting the life of aircraft engines, APUs and their LLP components.

These documents, depending on category, may be either mandatory or recommended for compliance. Determining the applicability and compliance requirements of AD, SB, and LLP restrictions is carried out by maintaining AD, SB and LLP status of engines and APUs

Development of alternative solutions for AD/SB in case of difficulties in executing original instructions – together with FAP-21J organisational unit

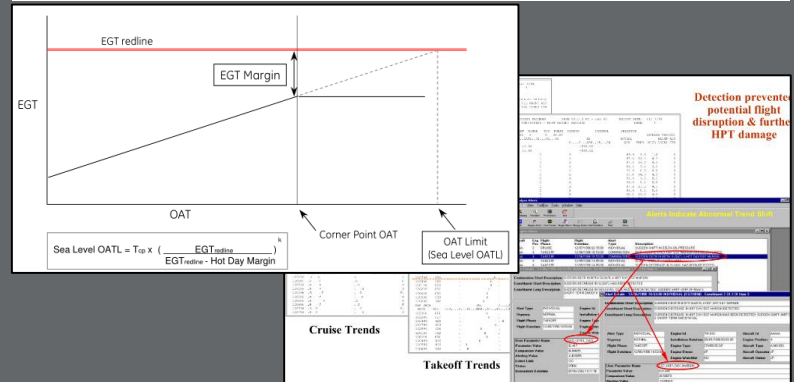
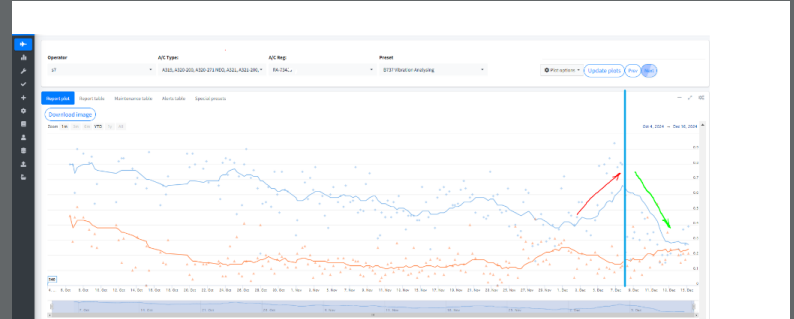
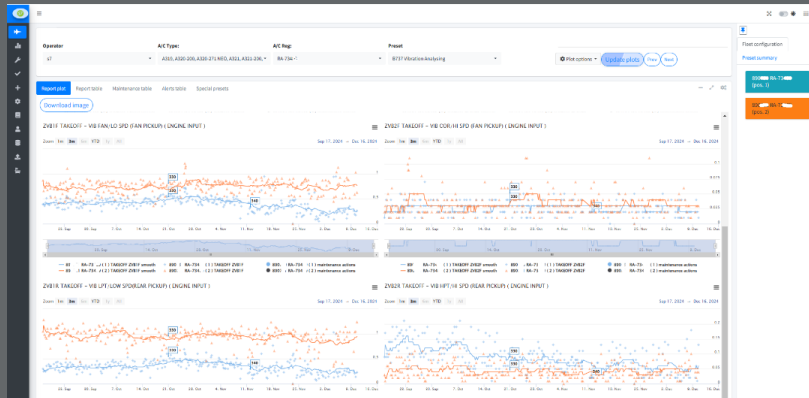


TRACKING ENGINE AND APU STATUS – AD, SB, LLP



The S7 Technics Engineering Center performs engine condition monitoring tasks using in-house developed software

Parameter monitoring allows assessing aircraft engine performance efficiency, anticipating negative deviations in advance, planning measures to prevent structural defects and failures of systems and components.



MANAGEMENT, RECORDING AND STORAGE OF AIRCRAFT TECHNICAL RECORDS

Collection of DFPs after work performed on aircraft and components, systematization by maintenance packages

Marking and recording of DFPs

Scanning DFPs into electronic archive

Boxing of DFPs

Creation of DFP inventory per aircraft

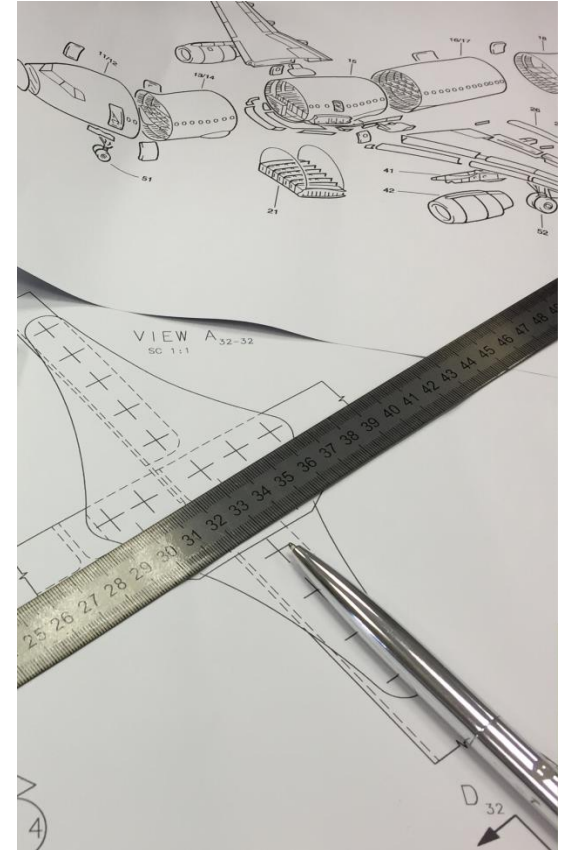
Storage of DFPs in an organized manner in specially prepared premises



ENGINEERING SUPPORT FOR AIRCRAFT MAINTENANCE EXECUTION

Engineering support for production during aircraft maintenance:

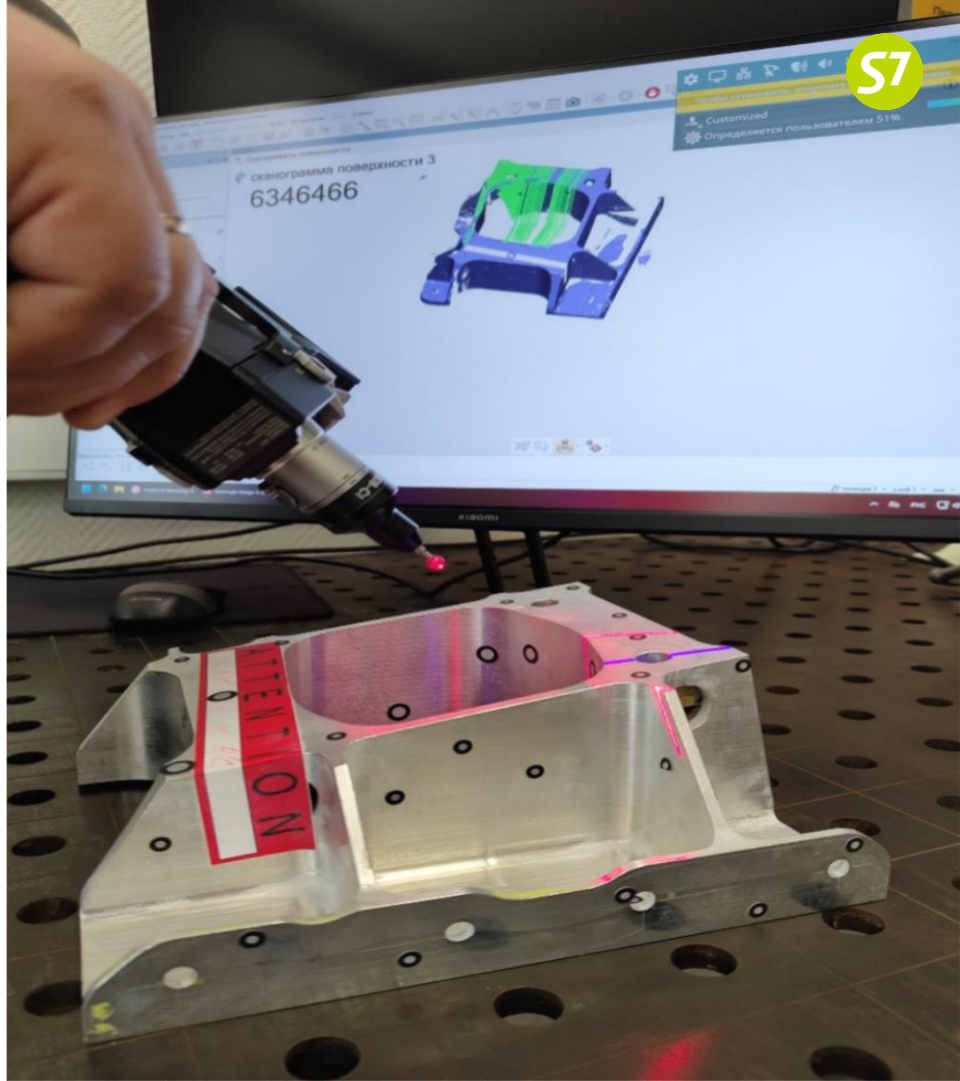
- Development of job cards and other technical documentation
- Production support for issues not described in technical documentation
- Development and support of complex aircraft maintenance procedures
- Obtaining instructions from Aircraft Manufacturer (where available). Obtaining technical solutions from Type Design Holder FAP-21J organisational unit)
- Analysis of consumables and tools for scheduled work
- WT administration in AMOS IS: entering man-hours and consumables
- Engineering support for production units on interior issues
- Development and revision of component job cards
- Extension of ratings and engineering support for component maintenance
- Tracking component continuing airworthiness status
- Cabin modifications
- Participation in aircraft redelivery projects



3D SCANNING

3D scanning department

- Contact measurement of part geometry on removed aircraft component
- Non-contact measurement of part geometry on installed aircraft component
- High-precision measurements for reverse engineering, monitoring deformation over time
- Inspection of geometrical characteristics of manufactured parts, displaying deviations in the form of a color map



ORGANIZATION AND IMPLEMENTATION OF AIRCRAFT STORAGE PROGRAM

Development of job cards for aircraft storage induction and removal

Development of periodic inspection program for the storage period

Production support for issues not described in technical documentation

Analysis of consumables and tools for the storage work package

Search for alternative materials

Analysis of deferral of any storage work due to lack of chemicals/consumables (e.g., anti-corrosion coating / microbiological tests)

Coordination with Operator of additional work, such as removal/installation of tablets, deactivation of VHF 3 system, etc.



DEVELOPMENT AND SUPPORT OF MINIMUM EQUIPMENT LIST (MEL)

Development of MEL based on the MMEL of the aircraft manufacturer country, taking into account Aviation Authority requirements, Customer's fleet configuration, and Customer's fleet operational characteristics

Revision of MEL based on MMEL changes, incorporating changes at Customer's request considering accumulated Customer's operational experience

Development of Russian-language version of MEL for aircraft registration with FATA



DEVELOPMENT AND IMPLEMENTATION OF SPECIAL PROCEDURES: TEST FLIGHT, WEIGHING AND OTHERS

Analysis of technical documentation to provide information to production units

- Development of job cards for special procedures
 - Production support for issues not described in technical documentation
 - Analysis of consumables and tools for special procedures
 - Maintaining up-to-date weighing forms for aircraft types: Boeing 737, 757, 767; Airbus A320F; Embraer E170, E190; Superjet RRJ-95
- Support for making adjustments to aircraft weight and balance recalculation due to missing components on the aircraft
 - Coordination of test flight procedure when parked for more than three months in airworthy condition
 - Development of installation of rented landing gear stands during major overhaul of main gear
 - Other at Customer's request



CONSULTING AND PARTICIPATION IN AIRCRAFT ACCEPTANCE AND REDELIVERY



Aircraft ACCEPTANCE

- Development and maintenance of aircraft acceptance procedure
- Organization and control of aircraft acceptance execution
- Representation of Operator's interests during aircraft acceptance

Aircraft REDELIVERY

- Organization and control of stages of aircraft and documentation preparation for redelivery to lessor
- Organization and control of preparation of additional work packages to bring aircraft into compliance with lease agreement redelivery conditions
- Communication with lessor on aircraft preparation and redelivery issues
- Organization and control of addressing lessor's findings to ensure their proper correction and timely closure



TURNKEY SUPERVISION AND EXECUTION OF AIRCRAFT REDELIVERY PROJECTS

- Minimizing costs associated with bringing aircraft into compliance with lease agreement
- Early analysis of lease agreement redelivery conditions to adjust redelivery maintenance work package, inclusion of additional work on AD/SB/STC/MODs/De-MODs, structural repairs and damage, component replacement/servicing (HT, LLP, OCCM), planning supply of necessary equipment to perform work according to lease agreement conditions
- Preparation of necessary documentation according to lease agreement, assembly of DFP package and certificates for used materials/components, preparation of main status reports, preparation of aircraft documentation (delivery, current certificates, interior equipment, archive documentation), transfer of prepared documentation to lessor
- Working with Open Item List. Analysis of received findings, assessment of their applicability to lease agreement conditions. Rectification of findings by area
- Cooperating with other departments (production, maintenance planning, archive, component repair shops)
- Providing assistance during aircraft inspection by Aviation Authorities, addressing inspector's findings
- Obtaining and transferring to lessor continuing airworthiness documentation, DFP for physical discrepancies from current redelivery maintenance
- Updating documentation after ferry flight to redelivery location



TURNKEY SUPERVISION AND EXECUTION OF AIRCRAFT DELIVERY PROJECTS

- Physical inspection of airframe, engines, aircraft systems and documentation – detailed visual inspection of airframe, engines, aircraft systems in access areas, verification of existing structural repairs and damage against structural repair map, visual inspection and verification of avionics/radio/emergency equipment, inspection of aircraft interior in accordance with customer requirements
- Verification of completeness of provided status reports and DFPs for AD/SB/STC, modifications, structural repairs and damage, installed components (HT, LLP, OCCM). Verification of sufficiency of remaining life of installed components in accordance with lease agreement conditions
- Issuing recommendations to Operator for bridging of Maintenance Program
- Verification of completeness of Manufacturer's documentation
- Verification of engine and APU condition: trends, LLP, presence of restrictions, presence of defects on external and internal surfaces and their correct documentation
- Maintaining an Open Item List including findings/non-conformities for all areas of aircraft acceptance. Verification of snag rectification both on aircraft and in documentation
- Providing status reports on acceptance project progress: main problems, optimal solutions
- Providing assistance during aircraft inspection by Aviation Authorities, addressing inspector's findings, preparation of technical act package for including aircraft in Operator's certificate
- Participation in negotiations with lessor



AIRCRAFT AND DOCUMENTATION INSPECTION, PREPARATION OF DISCREPANCY LIST

Verification of aircraft and documentation

for compliance with Manufacturer's documentation, Aviation Authority requirements of aircraft country of registration, and additional Customer requirements prior to lease agreement signing

Physical inspection of aircraft to assess actual condition: structural repairs and damage, engines and APU, components and aircraft configuration, interior condition

Verification of technical documentation (status reports/DFPs), archive condition, quality of technical records management

Based on inspection results – transfer of findings and recommendations to Customer



ASSISTANCE IN OBTAINING STATE AIRCRAFT REGISTRATION CERTIFICATE, AIRWORTHINESS CERTIFICATE, NOISE CERTIFICATE, RADIO STATION PERMIT

Providing assistance to Customer in obtaining State Aircraft Registration Certificate, Aircraft Airworthiness Certificate, Noise Certificate, Radio Station Permit

Completion of various forms for submission to Aviation Authorities

Representation of Customer before Aviation Authorities, provision of consulting services on various matters

Providing support to Customer during audits by various authorities



SERVICES FOR LESSORS

Audit of technical records in accordance with lease agreement and Aviation Authority requirements, preparation of snag list and its rectification for Aircraft Operator in the following areas:

- Status of Airworthiness Directives and Service Bulletins on aircraft, engines, APU and components
- Status of modifications and structural repairs of aircraft structure
- Utilization of airframe and components
- Execution of all scheduled maintenance tasks
- Aircraft configuration and status of components with overhaul and assigned life
- Operator documentation (Maintenance Program, ETOPS flight manual, Minimum Equipment List)
- Traceability of all components with assigned life
- Maintaining software baseline on aircraft
- Empty weight and balance (ELA) change due to performed modifications
- Monitoring aircraft weight and balance tracking
- Preparation of cabin equipment flammability certificates



SERVICES FOR LESSORS

Engineering and consulting services

Representation of lessor in communications with Aircraft Operator, Aviation Authorities and Manufacturer of aircraft and components

Physical inspection of aircraft for compliance with lease agreement and Aviation Authority requirements:

- Verification of damage and repairs for compliance with technical documentation, lease agreement and Aviation Authority requirements
- Inspection and verification of installed components
- Inspection of interior elements for compliance with technical documentation, lease agreement and Aviation Authority requirements
- Inspection of condition and compliance of aircraft markings with technical documentation, lease agreement and Aviation Authority requirements



FLIGHT DATA DECODING AND ANALYSIS



- 1 Work is performed on the basis of certificates issued by the Aviation Register of Russia for the following aircraft types:
 - Airbus A320F
 - Boeing 737-800 (bases 3B, 3C, B-7)
 - Boeing 737-8
 - Boeing 737-900 (bases 3B, 3C, B-7)
 - Boeing 757-200 (base 3B)
 - Embraer E-170
 - Gulfstream G-550
- 2 CVR data decompression and conversion into audio files for Honeywell p/n 980-6022, 980-6032, 980-6025; 7100 L3Harris, 2100 L3COMM units
- 3 Comprehensive flight data decoding
- 4 Specialized flight data decoding
- 5 Reconstruction of aircraft trajectory and glide slope for accuracy assessment
- 6 Verification of mandatory parameter recording on the DFDR with report generation
- 7 Verification of the recording read from the CVR (Cockpit Voice Recorder) with report generation

It is possible to perform flight data analysis and decoding for any aircraft type after the appropriate certification procedure



CVR Channel Recording Verification Check Report

A/C Reg. No.	XX-XXX
MSN	XXXX
A/C Type	XXXX-XXX
Operator	
Customer	
Report unique number	FRAD-CVR-NNN
Customer Ref Number	MIC / MISS No
Data Source	SSCVR
SSCVR Part Number	980-6022-001
SSCVR Serial Number	CVR120-XXXX
CVR Nominal duration time	2 HOURS
Reason for readout: MP task №	
Data readout date	DATE
After Flight Number	XXXX
Software for decompression	Playback32® P/N 998-3414-510
Decompression date	DATE

NOTE: This Verification Check Sheet must be send to the next addresses:

Prepared by FRAD Engineer	_____ Name	_____ Date	_____ Signature
Analyzed by FRAD Engineer	_____ Name	_____ Date	_____ Signature

S7

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