Subject:

AIRCRAFT TYRE MAINTENANCE AND OPERATIONAL PRACTICES

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1.0 GENERAL

i) The Nigeria Civil Aviation Authority Advisory Circulars (AC) contains information about standards, practices and procedures that the Authority has found to be acceptable for compliance with the associated Regulations.

ii) Consideration will be given to other methods of compliance which may be presented to the Authority.

iii) When new standards, practices or procedures are found to be acceptable they will be added to the appropriate AC.

2.0 PURPOSE

The purpose of this Advisory Circular (AC) is to provide guidance and best practices for the care and maintenance of aircraft tyres. Aircraft tyres play a critical role in ensuring safe operations, particularly during takeoff, landing, and taxiing. Proper tyre care and maintenance can prevent accidents, enhance aircraft performance, and extend the service life of tyres, thereby reducing operational costs. This AC establishes recommended procedures for tyre storage, inflation, inspection, retreading, and handling to ensure compliance with industry standards and manufacturer recommendations

3.0 APPLICABILITY

This Advisory Circular applies to all aircraft operators, Approved Maintenance Organizations (AMOs), aviation maintenance technicians, and any personnel responsible for the care and handling of aircraft tyres. It is also applicable to aircraft manufacturers, tyre manufacturers, tyre retread facilities and inspectors responsible for monitoring airworthiness compliance in relation to tyre maintenance. Compliance with this AC is strongly recommended to ensure optimal tyre performance and operational safety

4.0 REFERENCES

i) Nigeria Civil Aviation Regulations (Nig.CARs) Part 6 and 9
ii) All Operators Letter (FSG 001/21) ref NCAA/FSG/AOL/21/001: In-Service Maintenance of Aircraft tyre-Wheel Assembly and Operational Instructions in the Event of tyre Bursts During Aircraft Operation.
iii) Federal Aviation Administration AC 145-4B: Inspection, Retread, Repair, and Alterations of Aircraft tyres
iv) Federal Aviation Administration AC 20-97B: Aircraft tyre Maintenance and Operational Practices

5.0 . DEFINITIONS

For the purpose of this Advisory Circular, the following definitions apply:

a) **Aircraft Tyre**: A specially designed pneumatic tyre used on an aircraft's landing gear to support the aircraft's weight, absorb impact, and provide traction.

b) **Bias-Ply Tyre**: A tyre construction where the plies are laid at alternating angles, typically between 30° and 60° to the centerline, offering high load-carrying capacity.

c) **Radial** Tyre: A tyre construction with plies arranged perpendicular to the tyre's circumference, providing greater durability and heat dissipation.

d) **Tread**: The outer rubber layer of a tyre that makes contact with the runway and provides traction.

e) **Sidewall**: The portion of a tyre between the tread and the bead, offering lateral stability and environmental protection.

f) **Bead**: The reinforced part of a tyre that secures it to the wheel rim, preventing slippage.

g) **Inner Liner**: A layer within a tubeless tyre that maintains air pressure.

h) **Foreign Object Damage (FOD):** Damage to aircraft components, including tyres, caused by debris on the runway.

i) **Underinflation**: A condition where a tyre is not inflated to the recommended pressure, leading to excessive flexing and heat buildup.

j) **Overinflation**: A condition where a tyre is inflated beyond the recommended pressure, increasing stress and wear on the tyre structure.

6.0 GENERAL OVERVIEW OF AIRCRAFT TYRES

Aircraft tyres are an essential component of an aircraft's landing gear system, designed to perform reliably under extreme operational conditions. Unlike automotive tyres, aircraft tyres must support substantial loads and withstand high-impact forces while providing traction and stability. They are constructed with multiple layers of specialized materials to enhance durability, manage stress distribution, and resist environmental degradation.

6.1 Functions and Importance of Aircraft Tyres

Aircraft tyres serve several critical functions, including supporting the weight of the aircraft, providing traction during acceleration and braking, absorbing impact loads, and maintaining directional stability. A failure in any of these functions can compromise the safety of flight operations. Proper maintenance and adherence to recommended operational parameters are essential to ensure performance consistency and longevity.

6.2 Construction and Design Features

Aircraft tyres are built using highly engineered materials that enable them to withstand immense forces. The outermost layer, known as the tread, provides the necessary grip and is designed to resist wear from repeated landings. Beneath the tread, casing plies made of nylon or aramid reinforce the tyre structure, helping it maintain shape under pressure and preventing excessive expansion. The sidewall protects the internal structure while providing lateral stability, whereas the bead ensures a secure fit on the wheel rim, preventing slippage. In tubeless Tyres, an inner liner acts as an air-retaining layer to maintain internal pressure.

6.3 Types of Aircraft Tyres

Aircraft tyres are categorized based on their internal structure and air-retention methods. Bias-ply tyres feature multiple layers of fabric plies arranged at alternating angles, offering high load-carrying capacity but generating more heat. Radial tyres, on the other hand, have plies arranged perpendicular to the circumference, improving durability, heat dissipation, and efficiency. Additionally, tube-type tyres require an inner tube to hold air, whereas tubeless tyres are designed with an integrated liner that maintains air pressure without the need for a separate tube.

6.4 Operational Challenges and Environmental Factors

Aircraft Tyres operate under extreme conditions, including exposure to high speeds, substantial weight loads, and rapid temperature fluctuations. During takeoff and landing, tyres experience high rotational speeds, generating considerable centrifugal forces. They must also withstand abrupt heating upon runway contact and subsequent cooling at high altitudes. Foreign object damage (FOD) from debris on the runway poses an additional threat, leading to potential punctures or structural weaknesses. Furthermore, the high-pressure requirements of aircraft tyres necessitate regular monitoring to prevent overinflation or underinflation, both of which can impact performance and safety.

6.5 Maintenance and Best Practices

Due to the demanding conditions they endure, aircraft tyres require rigorous maintenance. Routine inspections should be conducted to detect wear, embedded objects, or structural damage before they escalate into critical failures. Maintaining proper inflation pressure is crucial, as deviations can lead to premature wear, increased fuel consumption, or even tyre blowouts. Retreading programs extend tyre lifespan by replacing worn tread while preserving the casing, contributing to cost efficiency. Proper storage and handling also play a vital role in preventing environmental degradation and ensuring that tyres remain in optimal condition before installation.

Understanding the fundamental characteristics, operational challenges, and best maintenance practices of aircraft tyres enables maintenance personnel and operators to enhance safety, performance, and cost-effectiveness in aircraft operations.

7.0. TYRE STORAGE

Proper storage of aircraft tyres is essential to maintain their integrity and prolong their service life. Incorrect storage conditions can lead to premature deterioration, structural weakening, and potential safety hazards. The storage environment, handling procedures, and preventive measures must be strictly adhered to in order to ensure that tyres remain in optimal condition before installation and use.

7.1 Storage Environment

Aircraft tyres should be stored in a clean, cool, dry, and well-ventilated space to minimize exposure to environmental factors that can degrade the rubber compound and internal structure. The recommended storage temperature is between **10°C and 30°C (50°F and 86°F)**. Storage areas should be shielded from direct sunlight and sources of excessive heat, as ultraviolet (UV) radiation can accelerate the aging process, causing the rubber to harden and crack. High humidity levels should be avoided, as moisture can lead to the deterioration of tyre materials and corrosion of embedded metal components.

Tyres should be stored away from electrical equipment, high-voltage machinery, and other sources of ozone. Ozone is particularly damaging to rubber compounds, leading to surface cracking and brittleness. Common sources of ozone include electric motors, electric generators, fluorescent lamps, mercury vapour lamps, battery chargers, electric welding equipment, etc. To prevent exposure, tyres should be stored away from such equipment and never in confined spaces where ozone concentration can accumulate.

7.2 Proper Positioning and Stacking

Tyres must be positioned carefully to avoid distortion or structural damage. Ideally, they should be stored in an upright position on racks designed to support their weight evenly. Storing Tyres upright prevents flat-spotting, a condition where the Tyre develops a permanent deformation due to prolonged static pressure.

If tyres are to be stored long term (greater than 90 days), it is advised that tyres stored on their treads are rotated by 90° at least once every 90 days, for the duration of their storage.

If stacking is necessary, it should be done in a controlled manner to prevent excessive stress on the lower tyres. The recommended stacking height depends on the tyre size and weight, but generally, stacks should not exceed **four tyres high** *(follow the recommendations by the tyre manufacturer).* When stacked horizontally, the heaviest tyres should be placed at the bottom, and periodic rotation of stacked tyres is advised to minimize the risk of permanent deformation.

7.3 Protection from Contaminants

Aircraft tyres must be kept free from oil, grease, solvents, hydraulic fluids, and other petroleum-based substances that can degrade the rubber. Contamination with such substances can lead to weakening of the rubber compound and compromise the tyre's structural integrity. If a tyre comes into contact with contaminants, it should be cleaned immediately using a mild soap solution and allowed to dry completely before storage.

Tyres should not be stored in proximity to chemicals, fuels, or volatile compounds, as exposure to chemical vapors can cause rubber degradation. Additionally, they should be kept away from sharp objects, tools, and metal surfaces that can cause punctures, cuts, or abrasions.

7.4 Tyre Storage with and without Rims

For tyres stored with rims, they should be inflated to a safe holding pressure, generally 50% of the recommended operating pressure, to maintain their shape without overstressing the casing. Fully inflated

Tyres should never be stored for extended periods, as internal pressure fluctuations can lead to structural stress and deformation.

Tyres stored without rims should be handled carefully to avoid damage to the bead area, which is critical for a secure fit onto the wheel assembly. Beads should not be allowed to touch the ground directly; instead, tyres should be placed on protective surfaces such as rubber mats or wooden pallets to prevent chafing and damage.

7.5 Storage Duration and Periodic Inspection

Aircraft tyres should not be stored indefinitely, as prolonged storage can lead to material aging. The maximum recommended storage duration varies by manufacturer. Tyres older than the recommended storage interval should be subjected to a thorough inspection by qualified personnel before installation.

Stored tyres should be periodically inspected for signs of deterioration, such as surface cracks, stiffness, or changes in texture. Any tyre showing signs of degradation should be removed from service and properly disposed of according to environmental and regulatory guidelines.

7.6 Handling and Transportation Considerations

Proper handling techniques are essential to prevent tyre damage during movement and transport. Tyres should not be dragged or rolled on rough surfaces, as this can cause cuts and abrasions. When lifting tyres manually, personnel should avoid gripping the bead area to prevent deformation. If mechanical equipment such as forklifts or hoists is used, it should be fitted with non-damaging supports to prevent structural damage.

During transportation, tyres should be secured in a stable position to prevent shifting and potential damage. If transported in stacked configurations, care should be taken to ensure they are not exposed to sharp impacts or excessive compression forces.

7.7 Care and Maintenance of tyres on Stored Aircraft

When an aircraft is placed in storage for an extended period, special attention must be given to its tyres to prevent degradation and ensure they remain airworthy when the aircraft is returned to service. The following measures should be implemented:

a) **Regular Pressure Checks:** Tyres on stored aircraft should be inspected and re-inflated to the manufacturer's recommended pressure at regular intervals, typically every 30 days. Underinflation can lead to tyre deformation and sidewall damage.

b) **Periodic Tyre Rotation:** If feasible, the aircraft should be jacked up and the tyres rotated periodically to prevent flat-spotting. If jacking is not an option, tyres should be repositioned slightly to distribute pressure evenly.

c) **Protection from Environmental Factors:** Aircraft should be parked on a dry, clean surface to prevent moisture accumulation around the tyres. If the aircraft is stored outdoors, tyre covers should be used to shield them from direct sunlight and UV radiation.

d) **Inspection for Ozone and Chemical Damage:** Since stored aircraft may be left near maintenance facilities with electrical equipment, regular inspections should be conducted to identify any signs of ozone-induced cracking or contamination from nearby chemicals.

e) **Assessment Before Reactivation:** Before returning the aircraft to service, a thorough inspection must be conducted on all tyres for signs of aging, cracking, foreign object damage, or significant tread wear. If any tyre shows signs of deterioration beyond acceptable limits, it should be replaced before flight operations commence.

7.8 Best Practices for Long-Term Storage

For long-term storage, Tyres should be covered with protective, breathable covers to shield them from dust and UV exposure while allowing proper air circulation. Covers should not be airtight, as trapped moisture can accelerate rubber deterioration. Additionally, the storage area should be monitored regularly to ensure environmental conditions remain within recommended parameters.

By adhering to these best practices, aircraft tyres can be preserved in optimal condition, ensuring their reliability and safety when placed into service.

8.0 TYRE INSPECTION AND MAINTENANCE

Aircraft tyre inspection and maintenance are critical to ensuring operational safety, preventing premature tyre failure, and maximizing service life. Routine inspections help detect early signs of damage, improper inflation, or excessive wear, allowing corrective measures before serious issues arise. Proper maintenance practices further enhance tyre longevity and reliability.

To ensure a standardized approach, operators should incorporate tyre inspection and pressure check intervals in the aircraft's **Approved Maintenance Program (AMP)** based on the strictest guidelines from either the aircraft manufacturer's manual or the tyre manufacturer's recommendations. Since different tyre brands may be used, the program should accommodate variations while ensuring compliance with the highest applicable standard.

8.1 General Inspection Guidelines

Aircraft tyres should be inspected before each flight, during routine maintenance, and after any hard landing or abnormal ground event. Inspections must be performed under adequate lighting, with close attention given to tread wear, sidewall integrity, and the presence of foreign objects or contaminants. Tread should not exhibit excessive wear, cuts, or embedded debris. The sidewalls must be free of cracks, bulges, or other defects that could compromise structural integrity. The bead area should be checked for deformation, corrosion, or damage that might affect the tyre's fitment to the wheel. Foreign objects such as stones or metal fragments should be removed to prevent punctures. Any signs of slow pressure loss should be investigated for bead seat damage or valve issues.

8.2 Tread Wear and Depth Monitoring

Tyre tread provides traction and resistance to wear, but as it diminishes, the risk of hydroplaning increases. Regular monitoring of tread depth using a calibrated gauge helps determine remaining service life. Uneven wear may indicate improper inflation or alignment problems. Tyres must be removed if wear indicators or the bottom of grooves become visible. Localized bald spots or excessive wear in one area require further investigation to identify underlying causes such as skidding events or mechanical faults.

8.3 Tyre Pressure and Inflation Maintenance

Correct inflation is essential for tyre performance and longevity. Underinflation leads to excessive heat buildup and structural failure, while overinflation increases casing stress and the risk of rupture. Pressure should be checked at ambient temperature using an accurate gauge, ensuring inflation aligns with manufacturer recommendations based on aircraft weight and operating conditions. Dry, filtered nitrogen should be used to minimize moisture buildup and pressure fluctuations. The oxygen content within the nitrogen must **not exceed 5%** to prevent oxidation and thermal degradation. If significant pressure loss occurs between inspections, leaks or valve malfunctions must be addressed promptly.

8.4 Identifying and Addressing Tyre Damage

Aircraft tyres are subjected to extreme loads and environmental conditions that can cause damage. Cuts and punctures require immediate attention if they extend deep into the casing. Bulges or blisters suggest internal failure and necessitate replacement. Sidewall cracking, particularly deep fissures, indicates ozone exposure or rubber degradation. Heat damage, evident from glazing or discoloration, results from high-speed operations, underinflation, or braking issues. Flat spots caused by locked brakes should be evaluated based on depth and size, with excessive cases requiring tyre replacement.

8.5 Handling of Tyres During Maintenance

Care must be taken when handling aircraft tyres to prevent accidental damage. Non-metallic tools should be used to avoid bead damage. Excessive force during mounting or dismounting should be avoided, and proper lubrication must be applied to prevent bead tearing. Wheel assemblies and brake components should be inspected before installation to ensure compatibility and prevent premature wear. Tyres that have been improperly stored, exposed to unknown conditions, or exceeded their service life limits must not be mounted on an aircraft.

8.6 Retreading Policies and Procedures

Retreading extends tyre service life by replacing worn tread while maintaining the original casing. The process must comply with manufacturer guidelines and industry standards. Casings should undergo thorough inspection before retreading to ensure structural integrity. The number of permitted retreads should be limited based on manufacturer recommendations and the tyre's operational history. Post-retreading inspections must confirm compliance with safety and quality standards before the tyre is returned to service. **See Section 10.0 for detailed information on aircraft tyre retread.**

8.7 Disposal of Unserviceable Tyres

Tyres that have reached their service limit, sustained irreparable damage, or failed inspection must be removed from service and disposed of in compliance with environmental regulations. Recycling programs allow rubber to be repurposed for non-aviation applications. Incineration, when used, must adhere to

environmental standards to minimize harmful emissions. Safe disposal at designated facilities helps prevent environmental contamination.

9.0 TYRE REMOVAL, REPLACEMENT, AND INSTALLATION

Proper tyre removal, replacement, and installation procedures are essential for ensuring aircraft safety and maximizing the lifespan of new or retreaded tyres. Adhering to best practices reduces the risk of improper fitment, bead damage, and other potential failures that could compromise aircraft operation.

9.1 Criteria for Tyre Removal

Aircraft tyres must be removed from service under any of the following conditions to ensure continued operational safety and compliance with airworthiness standards:

a) Pressure-Related Removal

i. Any hot tyre with a pressure exceeding 200% of the cold-rated inflation pressure.

ii. Hot tyres with pressures between 95% and 99% of the normal cold specification pressure must be removed and scrapped.

iii. Hot tyres below 95% of the normal cold specification pressure must be removed along with the mating tyre, and both must be scrapped.

iv. Any tyre with inflation pressure below 80% of the specified operational pressure requires removal along with the companion tyre on the same axle.

b) Operational Stress and High-Load Events

i. Tyres subjected to high-energy rejected takeoffs, overspeed landings, or severe braking conditions.

ii. Tyres that have deflated due to fuse plug release, particularly if this occurred while rolling; the mating tyre must also be removed.

iii. Any tyre that has suffered a burst requires the removal of all companion tyres on the same axle.

c) Structural Integrity Issues

i. Excessive tread wear, including wear down to the base of any groove over more than 1/8 of the circumference.

ii. Sidewall damage, including weather checking, cracking, or cuts extending to the casing ply.

iii. Any bulging or separation in the tread, sidewall, or bead areas.

iv. Groove cracking that exposes fabric or causes undercutting of tread ribs.

v. Sidewall indentations equal to or exceeding 3 mm in depth.

vi. Bead area damage resulting from excessive heat, brake drag, or severe braking events.

d) Contamination and Environmental Damage

i. Tyres contaminated by fuel, oil, hydraulic fluid, or Skydrol that show rubber softening, swelling, or delamination.

ii. Tyres exhibiting ozone or weather checking with exposed fabric.

iii. Cuts, snags, or cracks (radial or circumferential) that expose fabric.

9.2 Removal Procedures

Before removal, ensure the aircraft is properly supported, and wheel assemblies are secured. Deflate the tyre completely before breaking the bead to prevent injury. Use manufacturer-approved bead-breaking tools to avoid damaging the bead area. When removing the tyre from the wheel assembly, inspect the wheel for cracks, corrosion, or any structural defects that may affect future operation. Clean and prepare the wheel for the new tyre installation.

9.3 Selection of Replacement Tyres

Replacement tyres must conform to the aircraft type certification, meet operational load requirements, and comply with manufacturer specifications. The selection should consider factors such as ply rating, speed rating, and compatibility with the existing wheel assembly. If switching between different tyre brands, operators should verify compliance with applicable regulations and performance standards. Retreaded tyres should only be used if they meet airworthiness and operational requirements.

9.4 Tyre Installation Procedures

During installation, inspect the new tyre for manufacturing defects, proper bead seating, and overall integrity. Ensure the tyre is correctly oriented according to directional markings. Apply an appropriate bead lubricant before seating the tyre to minimize stress and ensure a proper fit. Inflate the tyre in gradual increments, checking for proper bead seating. Ensure that inflation pressure is set according to aircraft manufacturer specifications.

9.5 Post-Installation Checks

After installation, conduct a thorough inspection to verify proper seating, inflation, and alignment. Perform a leak check to confirm there are no slow pressure losses. Check wheel balancing and torque values to prevent operational issues. A final inspection before returning the aircraft to service ensures compliance with safety and operational requirements.

10.0 AIRCRAFT TYRE RETREAD

Tyre retreading is a critical, cost-effective, and environmentally sustainable practice in aircraft operations. It allows for the reuse of structurally sound tyre casings while restoring the tread to optimal condition. A well-defined retreading policy ensures compliance with safety regulations and industry best practices, thereby maintaining operational integrity and reliability. The process must strictly adhere to international

standards such as SAE-ARP 4834, SAE-ARP 5265, and SAE-ARP 4833 to ensure the quality and airworthiness of retreaded tyres.

10.1 General Retreading Requirements

Aircraft tyre retreading must be performed by an NCAA-approved and certified maintenance facility using standardized methods that preserve the structural integrity of the tyre casing. The process must include thorough inspections, adherence to specified retreading limits, and stringent quality control measures to ensure that retreaded tyres meet or exceed original performance specifications.

Retreading facilities must:

a) Follow prescribed safety and operational procedures.

b) Use only approved materials and techniques.

c) Maintain detailed records of each retread cycle.

d) Ensure compliance with regulatory and manufacturer specifications.

10.2 Tyre Casing Inspection and Qualification for Retreading

Before a tyre casing is approved for retreading, it must undergo a rigorous inspection process to determine its suitability. This includes:

a) **Visual Inspection** – Checking for cuts, bulges, embedded foreign objects, and signs of overheating or excessive wear.

b) **Non-Destructive Testing (NDT)** – Using shearography, X-ray, or ultrasonic inspections to detect internal separations, ply damage, or belt misalignment.

c) **Dimensional Checks** – Measuring tread groove depths, bead diameter, and circumference to ensure casing integrity.

d) **Bead Condition Assessment** – Inspecting for excessive wear, deformation, or bead wire exposure.

e) **Previous Retread History Review** – Ensuring the number of retreads does not exceed the manufacturer's specified limit.

Casings that fail any of these criteria must be rejected and permanently removed from service.

10.3 Retreading Process

The retreading process must comply with SAE-ARP 4834, SAE-ARP 5265, and SAE-ARP 4833, following these key steps:

a) **Buffing** – Removing the worn tread precisely to avoid structural damage and maintain casing balance.

b) **Repair** – Repairing minor casing damage using approved materials and techniques, subject to manufacturer limitations and NCAA's approval.

c) **Building** – Applying a new tread compound to ensure uniform thickness and proper adhesion.

d) **Curing** – Subjecting the tyre to a controlled vulcanization process under regulated temperature and pressure conditions.

e) **Final Inspection** – Conducting visual and NDT inspections to confirm structural integrity and compliance with airworthiness requirements.

f) **Marking and Certification** – Permanently marking each retreaded tyre with an identification number and retread cycle count for traceability and compliance.

10.4 Performance and Safety Considerations

Retread facilities and operators must ensure that retreaded tyres meet all operational performance expectations, including:

a) **Load-Bearing Capacity** – Retreaded tyres must withstand loads and stresses equivalent to new tyres, demonstrated through dynamometer test cycles. Compliance with dynamometer test cycles should be as per TSO-C62.

b) **Speed and Heat Resistance** – The tread must maintain stability under high-speed operations and resist heat buildup.

c) **Structural Integrity** – The casing must retain its strength and flexibility for subsequent service cycles.

d) **Balancing and Uniformity** – Proper weight distribution and tread alignment must be verified to prevent vibration or uneven wear.

e) **Inflation Retention** – Pressure retention must be confirmed per TSO-C62.

10.5 Marking and Identification Requirements

Each retreaded tyre must be permanently marked with manufacturer and retreading facility identification, unique serial number and retread cycle count, date of retreading and approval markings, and compliance with NCAA, FAA and EASA certification requirements.

Additionally, retread identification must include the retreader's name or registered trademark, retread plant identification code, the month and year of retreading, and the letter "R" followed by the number of retreads.

Casing identification markings must be restored if removed, including airworthiness compliance markings, Tyre specifications, manufacturer details, and part numbers.

10.6 Operational Limitations and Maintenance of Retreaded Tyres

Retreaded Tyres must be maintained under stringent practices **similar to new tyres**. This includes, inter alia, the storage conditions, inspection, maintenance, installation, and removal requirements specified in this AC and those that may be specifically delineated by the tyre manufacturer and retread facility

10.7 Disposal of Non-Retreadable Tyres

Casings that exceed the maximum allowable retreads or sustain irreparable damage must be permanently removed from service. Disposal should align with environmental regulations, with preference given to recycling programs that repurpose materials for non-aviation applications.

11.0 General Documentation Requirements

Proper documentation is essential for ensuring the safety, reliability, and regulatory compliance of aircraft Tyres. Operators, maintenance organizations, and retreading facilities must maintain accurate and up-to-date records of all Tyre-related activities, including procurement, inspection, servicing, repairs, and disposal.

11.1 Tyre Procurement and Acceptance Records All newly acquired tyres must be accompanied by the following documents:

a) Manufacturer's Certificate of Conformity (CoC) confirming compliance with applicable industry standards.

b) Shipping and receiving inspection records verifying tyre specifications, batch number, and condition upon delivery.

c) Storage and shelf-life records ensuring compliance with manufacturer-recommended storage conditions.

11.2 Inspection and Maintenance Records To ensure continued airworthiness, each tyre must have a documented history of inspections and maintenance, including:

a) Pre- and post-flight visual inspection logs.

b) Inflation pressure monitoring records.

c) Tread wear assessment reports.

d) Damage and defect reports, including any corrective actions taken.

e) Summary of maintenance actions such as pressure adjustments, balancing, and minor repairs.

11.3 Tyre Repair and Replacement Records For damaged or worn tyres undergoing repair or replacement, the following documentation must be maintained:

a) Repair assessment and work completion reports.

b) Non-Destructive Testing (NDT) results for any repairs performed.

c) Certification of repair performed in accordance with applicable standards.

d) Disposal records for unserviceable tyres, including environmental compliance documents.

11.4 Retreaded Tyre Documentation and Traceability Each retreaded tyre must be accompanied by proper documentation to ensure compliance and traceability. Required documents include:

a) **Retread Certification Document**

i. Confirms the tyre has passed all required inspections and tests.

ii. Includes a statement of conformity to industry standards (SAE ARP 4833, ARP 4834, ARP 5265).

iii. Signed by an authorized quality control inspector from the retreading facility.

b) **Inspection and Test Reports**

i. NDT Reports (shearography, X-ray, ultrasonic inspections).

ii. Pressure Test Report (inflation and retention results).

iii. Load and Speed Test Results (dynamic load and speed compliance).

iv. Rubber Adhesion and Hardness Reports (bonding and material quality verification).

c) **Identification and Traceability Documents**

i. Tyre Serial Number and Retread Cycle History.

ii. Tyre Specification Sheet (size, ply rating, applicable aircraft types).

iii. Maintenance and Usage Guidelines.

d) **Regulatory Compliance and Release Certificate**

i. Authorized Release Certificate (NCAA Form 1, FAA Form 8130-3, or EASA Form 1).

ii. Retreading Facility Certification Information (Approved Maintenance Organization details).

11.5 Record Retention and Accessibility All Tyre-related documentation must be retained for a period specified by regulatory authorities or as required by operational procedures. Records should be stored in a secure and accessible manner, either in physical or electronic format, to facilitate audits, traceability, and regulatory oversight.

a) Operators must ensure that maintenance personnel, quality assurance teams, and regulatory inspectors have access to tyre maintenance records when required.

b) Retreaded and repaired tyre records should be maintained for a period sufficient to cover their operational life and subsequent disposal.

c) Any discrepancies, non-conformities, or rejected tyres must be documented and retained for regulatory review.