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School of Business
Bachelor of Business Administration
Semester End Examination - May 2024

Duration : 180 Minutes
Max Marks : 100

Sem VI - D1UB602T - Aviation Maintenance Management

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) Using the Maintenance Steering group(MSG- 3) approach, identify the difference between hidden failure and evident failures as reported by the flight crew. K3 (6)

- 2) Caselet: Aircraft Training at GOAir K3 (9)
When GOAir acquires new aircraft from manufacturers like Airbus, it ensures that its personnel receive training on the equipment installed on the new models. For instance, if GOAir already operates Airbus A320 aircraft and acquires newer variants such as the A321, training sessions would primarily cover the differences between the two models rather than repeating basic training on the entire airframe. This approach allows for efficient knowledge sharing and minimizes the need for on-site training, especially when only a few personnel require specialized training.
Based on above answer the Questions:
 1. How does GOAir determine the training needs of its personnel when introducing new aircraft into its fleet?(3)
 2. What strategies can GOAir implement to ensure that personnel attending training sessions on new aircraft models effectively transfer their knowledge and skills?(3)
 3. How does GOAir evaluate the effectiveness of training programs in enhancing the competency and proficiency of its maintenance personnel?(3)

- 3) Examine the need for maintenance training programs in aircraft maintenance operations. K4 (4)

4) Caselet: Transitioning to Digital MRO in the Aviation Sector

Airlines that digitize their maintenance operations can achieve various benefits, including improved visibility into scheduling needs and compliance requirements. Many organizations in the aviation sector still rely on traditional methods such as pen and paper for Maintenance, Repair, and Overhaul (MRO) operations. However, transitioning to digital MRO is not without its challenges. The aviation industry faces obstacles such as organizational barriers and regulatory complexities that hinder the adoption of digital technologies.

Based on above answer the Questions:

1. What are the key challenges faced by airlines in transitioning from traditional pen-and-paper methods to digital MRO?(4)
2. How can collaboration among stakeholders in the aviation industry facilitate the standardization of digital MRO? (4)

5) Caselet: Deferred Maintenance Challenges at United Airlines

United Airlines operates a busy network of flights, with aircraft frequently stopping at various line stations during their routes. As a consequence of this arrangement, a greater number of deferred maintenance actions are often taken at line stations rather than at the home base. During a routine inspection, the maintenance crew on site determines that the repair can be deferred until the aircraft reaches its home base. However, now due to limitations in parts, supplies, or maintenance personnel at the line station, coordination with the MCC becomes necessary to arrange for the required resources.

Based on above answer the Questions:

1. What factors should United Airlines consider when deciding whether to defer maintenance actions at line stations?(4)
2. How can United Airlines improve its coordination with the MCC to ensure efficient resolution of maintenance issues at line stations?(4)

- 6) Potential for MRO Facility at Amarda Airfield, Odisha: With India's commercial aviation fleet set to double by 2030, old airport at Amarda Road in Odisha is proposed as a suitable location for establishing an MRO facility. It has the potential to generate direct employment for 10,000 workers and contribute to foreign exchange earnings by servicing both civilian and defence aircraft. Additionally, the existing MIG engine factory at Koraput can be repurposed as an engine overhaul center to complement the MRO facility. This would not only address the growing demand for aircraft maintenance in India but also position Odisha as a key player in the global aviation industry. Based on above answer the following: K5 (10)

1. Analyze the significance of establishing an MRO facility at Amarda Airfield in Odisha for the Indian aviation industry.(5 marks)
2. Analyze the potential economic benefits of converting the Amarda Airfield into an MRO facility, including direct employment generation and foreign exchange earnings.(5 marks)

- 7) Caselet: Maintenance Discrepancy Handling at Omega Airlines K5 (10)
- During a routine preflight inspection, the flight crew of an Omega Airlines aircraft identifies a minor discrepancy with the navigation system. Following protocol, they document the issue in the aircraft's logbook and notify the MCC. The MCC promptly assesses the discrepancy and determines the appropriate course of action in consultation with the AMT team. In this case, it is decided that the issue can be deferred under Omega Airlines' Minimum Equipment List (MEL) program. The AMT team then updated the logbook with the necessary information and authorization number obtained from the MCC.

Based on above answer the Questions:

1. How does the collaborative approach between flight crew, MCC, and AMT team at Omega Airlines ensure effective and timely resolution of maintenance discrepancies?(5)
2. What are the key benefits and implications of Omega Airlines' MEL program in managing maintenance discrepancies?(5)

Case Study: SpiceJet Aircraft Incident

In April, SpiceJet flight VT-SLH encountered severe thunderstorms en route from Delhi to Kolkata, resulting in injuries to 14 passengers. Pilots reported concerns regarding the reliability of the aircraft's radar system amidst turbulent weather conditions. Subsequent investigations revealed that SpiceJet's Maintenance Control Center (MCC) had prior knowledge of the radar's reliability issues, yet no action was taken to address them. Despite pilot complaints and reports, SpiceJet denied any defects with the weather radar, asserting adherence to routine maintenance checks and regulatory standards. However, experienced pilots and engineers highlighted the challenges of accurately assessing the radar's performance during ground testing. This incident raises significant questions about the airline's safety protocols, communication channels between flight crews and maintenance personnel, and the balance between operational pressures and safety considerations, particularly in regions prone to adverse weather conditions. Addressing these concerns is paramount to maintaining passenger safety and regulatory compliance within the aviation industry.

Based on above answer the questions:

1. What are the potential safety implications of operating an aircraft with known equipment reliability issues? (3)
2. How can airlines improve communication channels between flight crews, maintenance personnel, and the MCC to ensure timely reporting? (3)
3. What steps should airlines take to address reported concerns regarding equipment reliability, like weather radar, to mitigate safety risks? (3)
4. How can regulatory bodies ensure airlines adhere to safety protocols and promptly address reported equipment issues? (3)
5. What enhancements can be made to aircraft maintenance procedures to accurately assess systems' performance? (3)

9) Case Study: Addressing Supply Chain Challenges in India's Aviation Industry

K6 (12)

Background: India's aviation sector is experiencing significant growth, with airlines like IndiGo and Air India placing large orders for new aircraft to meet increasing demand for air travel. However, the surge in fleet development has brought attention to the challenges in the aircraft parts supply chain, affected by global disruptions like wars, pandemics, and political sanctions. Addressing Supply Chain Challenges: Air India and IndiGo, two major players in the Indian aviation industry, are proactively seeking solutions to navigate supply chain challenges. They are pursuing approvals to source non-critical aircraft items locally in India instead of relying solely on international manufacturers. This strategic shift aims to reduce waiting times for critical parts from six months to as little as one month, enhancing operational efficiency and minimizing downtime for aircraft maintenance.

Benefits of Local Sourcing:

1. Reduced Lead Times: By sourcing components locally, airlines can significantly reduce lead times for acquiring critical aircraft parts.
2. Improved Operational Capability: Access to a local supply chain enhances the operational capability of airlines, allowing them to quickly address maintenance.
3. Mitigating Risks: Local sourcing of aircraft parts reduces dependence on international supply chains, mitigating risks associated with global disruptions..

Situational-Based Questions:

1. How does the growing demand for air transport in India contribute to the challenges faced by airlines in managing their aircraft parts supply chain? (3 marks)
2. Analyze the benefits of sourcing aircraft components locally in India for airlines like Air India and IndiGo. (3 marks)
3. Evaluate the role of regulatory approvals and collaboration with local suppliers in facilitating the transition towards local sourcing of aircraft parts. (3 marks)

- 10) Case Study: Impact of the Covid-19 Pandemic on Aircraft Parking and Maintenance: During pandemic, as flight movements drastically reduced, airlines encountered significant parking issues, especially at major airports like Delhi and Mumbai. The surplus of parked aircraft posed logistical and financial challenges, requiring meticulous maintenance to ensure their readiness for future operations. Aircraft parked for extended period's required extensive maintenance to preserve their functionality and safety. Maintenance tasks include protection against environmental factors such as humidity, insects, and wildlife, as well as regular checks to prevent corrosion and ensure operational readiness. Additionally, the financial burden of parking charges, which can amount to \$1,000 a day for a large aircraft in India, adds to the overall cost of maintaining grounded fleets. Airlines worldwide were exploring alternative storage options, choosing arid regions like Australia and the Mojave Desert in the U.S.A. Specialized maintenance procedures including running engines, rotating wheels, and covering sensors and engines to protect inner workings from environmental elements was done to improve the life. Moreover, specialized equipment such as moisture absorption sachets and chocks were utilized to maintain aircraft integrity during storage. As the aviation industry recovered from the pandemic, airlines required to address the challenges of parking and maintaining grounded aircraft efficiently. Long-term storage in dry and hot environments presents logistical and operational advantages, but the scalability of such solutions remained a concern. Additionally, the financial implications of extended aircraft parking and maintenance pose significant challenges for airlines striving to recover from the economic downturn.

Based on the above, answer the following:

1. Elaborate what strategies can airlines adopt during periods of reduced demand and surplus fleet capacity? (3 marks)
2. Discuss how can airlines mitigate expenses while ensuring the readiness of grounded fleets for future operations? (3 marks)
3. What role can regulatory bodies and industry associations play in addressing the challenges associated with aircraft parking and maintenance? (3 marks)
4. How can advancements in aircraft maintenance technology help reduce maintenance and operations costs? (3 marks)
5. What are the advantages and disadvantages of long-term storage solutions in dry regions compared to traditional airport parking facilities? (3marks)
6. What long-term strategies should airlines adopt to be more flexible in managing aircraft fleets from such situations? (3 marks)