

**ICAO***International Civil Aviation Organization***Ninth Meeting of the Aerodromes Operations and Planning Sub-Group (AOP/SG/9)***Bangkok, Thailand, 30th June to 4th July 2025***Agenda Item 5: State's/Aerodrome Operator's update and best practices on:****– Safety management oversight of ground handling services****GROUND HANDLING SAFETY: END-OF-LIFE MANAGEMENT FOR GROUND SUPPORT EQUIPMENT (GSE)***(Presented by Malaysia)***SUMMARY**

This paper explores how MA Sepang, an aerodrome operator in Malaysia, manage the end-of-life phase of Ground Support Equipment (GSE) and non-motorized vehicles used in ground handling. These often-overlooked equipment plays a key role in keeping aircraft operations smooth and efficient. As the equipment ages, proper management becomes crucial. The paper reviews current practices, regulations, and lifespan considerations to support safety, efficiency, and sustainability. It also highlights the risks of aging GSE and the need for collaboration to improve safety in airport operations.

1. INTRODUCTION

1.1 Ground Support Equipment (GSE), comprising both motorised and non-motorised vehicles, plays a vital role in airport ground handling operations by supporting aircraft servicing and turnaround. As the backbone of airport operations, GSE ensures that processes run smoothly and efficiently.

1.2 However, a significant challenge faced not only at KLIA but also at other aerodromes is the continued use of aging equipment beyond its intended lifecycle. This prolonged use can lead to critical safety and operational issues, including oil spillages, increased risk of accidents and incidents, reduced efficiency, higher maintenance costs, and the presence of unserviceable equipment left on the airside.

1.3 MA Sepang recognizes the growing importance of effectively managing aging assets and has implemented a robust end-of-life strategy. This approach emphasizes comprehensive inspections, proactive maintenance, timely decommissioning, and environmentally responsible recycling. All measures are carried out in compliance with regulatory standards to ensure safe, efficient, and sustainable airport operations.

2. DISCUSSION

2.1 At Kuala Lumpur International Airport (KLIA), around 3,000 units of non-motorized and 2,500 units of motorized GSE are in use across the airside area. With such a large equipment in operation, it is essential that all ground handlers take shared responsibility to ensure only serviceable and properly maintained equipment is used.

2.2 However, given the scale of operations and the fact that around 40% of motorized GSE units are over 11 years old, the airport continues to face several recurring operational and safety challenges, including:

- a) Oil leaks and fluid spillages from aging vehicles;
- b) Unserviceable or abandoned equipment obstructing operational areas;
- c) Haphazard parking of GSE;
- d) Increased risk of mechanical failures and ground incidents;
- e) Reduced efficiency during aircraft turnaround processes;
- f) Obstruction of key safety areas such as fire hydrants, airside roads, and emergency access routes; and
- g) Equipment without proper markings or reflectors, posing risks during low-visibility or night operations.

2.3 To address these challenges, KLIA has undertaken a comprehensive case study and introduced a combination of long-term and short-term measures aimed at improving ground operations and equipment management.

Long-Term Measures:

- a) A series of workshops and engagement sessions have been held with all ground handling stakeholders to promote awareness, encourage collaboration, and align on best practices for GSE management.
- b) The Ministry of Transport Malaysia (MOT) is currently working on formalising a national policy that will set age limits for GSE equipment across all aerodrome in Malaysia, helping to ensure consistent standards and improve safety.
- c) All ground handling parties have collectively agreed to a phased replacement plan for aging GSE. This plan includes a strong commitment to prioritising the acquisition of newer, more efficient, and environmentally-friendly equipment to support sustainable airport operations in the long run.
- d) As part of its broader sustainability strategy, KLIA is also developing a comprehensive Electric Vehicle (EV) Masterplan to guide the transition toward greener airside operations. The masterplan will include:
 - i) A structured transition to electric GSE across all ground handling service providers;
 - ii) Strategic planning and installation of dedicated EV charging infrastructure at key operational locations;

- iii) Development of operational procedure, coordinated charging schedules, and enforcement mechanisms to ensure effective airside EV management; and
- iv) Integration of future green initiatives and alignment with national carbon reduction goals to foster a more sustainable airport environment.

Short-Term Measures:

2.4 To complement long-term initiatives, KLIA has also introduced immediate actions to address pressing ground handling issues and improve compliance across the airside.

- a) A dedicated 24-hour GSE enforcement team has been established to conduct regular patrols, carry out on-the-spot inspections, and take enforcement action where necessary. This team plays a crucial role in ensuring that all equipment operating on the airside meets safety and serviceability standards.
- b) A structured penalty and enforcement framework has been introduced to deter non-compliance and encourage proper handling of GSE:
 - i) Summons and fines of up to RM300 (approximately USD 65) may be imposed for the following violations:
 - Haphazard or illegal parking of GSE;
 - Operation of unserviceable, unsafe, or non-compliant equipment; and
 - Breaches of airside safety regulations.
 - ii) **Cleaning Charges for Spillage:** Any GSE found to be causing oil, fuel, or hydraulic fluid spillage will be subject to a mandatory cleaning charge. The responsible owner or operator will bear the cost, with cleaning fees starting from RM1,500 (approximately USD 325), depending on the size and severity of the spillage. These charges cover chemical treatment, manpower deployment, and proper waste disposal in accordance with environmental and safety regulation.
- c) KLIA has also implemented designated parking zones to improve GSE organization and reduce clutter across the airside, enhancing both safety and operational efficiency:
 - i) **Equipment Parking Area:** Reserved for GSE that is actively in use and required for less than one hour during aircraft turnaround. This allows quick access while maintaining orderly operations near aircraft stands.
 - ii) **Equipment Staging Area:** Designated for the organised parking of all other GSE not in immediate use. This area helps prevent congestion around gates and taxiways, ensuring equipment is stored safely and efficiently when not in active operation.
- d) Any unserviceable or abandoned ground support equipment (GSE) found on the airside will be towed to a secure compound. Ground handling operators will be formally notified and must resolve any identified issues before the equipment is released. This measure promotes accountability and helps maintain a safe, orderly, and efficient airside.

- e) Daily enforcement reports and safety observations are shared with all ground handling agents to monitor performance and promote continuous compliance. This proactive approach helps identify recurring issues, encourage corrective actions, and support a culture of safety and accountability across airside operations.
- f) KLIA has initiated a series of workshops with all ground handling stakeholders to develop structured migration plans for transitioning to electric GSE. These sessions aim to:
 - i) Ensure each ground handler prepares and submits a clear roadmap for EV adoption;
 - ii) Coordinate the installation of EV charging infrastructure based on projected fleet requirements and operational demand; and
 - iii) Align operational policies for EV deployment, including charging schedules, usage procedures, and enforcement mechanisms.
- g) KLIA conducts routine site visits and joint inspections in collaboration with the Civil Aviation Authority of Malaysia (CAAM) and other relevant regulatory agencies. These coordinated inspections serve to:
 - i) Monitor the operational performance of ground handling service providers;
 - ii) Identify and address areas for safety enhancement; and
 - iii) Ensure continuous compliance with national regulations and standards.

Conclusion

2.5 Through a thoughtful balance of long-term planning and immediate on-the-ground action, KLIA has made meaningful progress in tackling the challenges of aging ground support equipment and inconsistent operational practices.

2.6 This progress achieved is the result of strong collaboration among ground handling partners, backed by clear policy direction from the Ministry of Transport Malaysia. From ongoing engagement and a phased equipment replacement plan to active enforcement and smarter airside management, every step taken reflects a shared commitment to safety, accountability, and sustainability.

2.7 As these efforts continue to gain momentum, KLIA is well on its way to setting a positive example for GSE management at aerodrome across the country. More importantly, these initiatives help ensure that airside at KLIA remains safe, efficient, and ready to meet the demands of modern airport operations.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) deliberate the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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