MARSHALL

C-130 Operational Usage Evaluation (OUE)

Enhancing availability through data-driven aircraft usage and maintenance

Fleet operators can realise **significant improvements in availability and cost** through mature, proven processes for evaluating and monitoring usage patterns of individual aircraft and sub-fleets.

Drawing on **decades of support for the C-130 Hercules and our close relationship with Lockheed Martin**, Marshall Aerospace has developed a range of solutions for C-130 Operational Usage Evaluation (OUE), Individual Aircraft Tracking (IAT) and Structural Health Monitoring (SHM).

Our approach is **systematic**, initially working with operators to assess and refine existing OUE and fatigue monitoring processes, which can be used to develop recommendations for fleet management and maintenance optimisation.

Overview

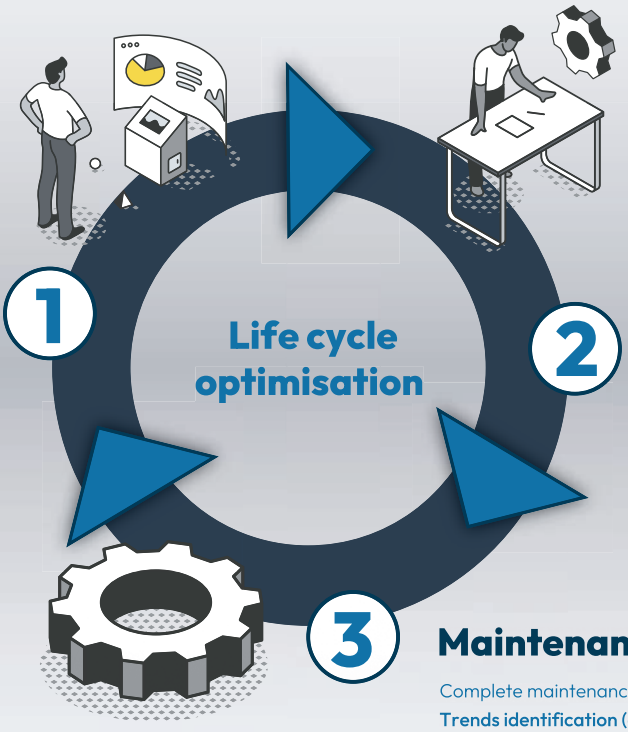
C-130 operational usage evaluation (OUE) aims to assess the rate of fatigue life accrual by capturing, preparing and analysing flight data and comparing actual usage patterns against a baseline provided by Lockheed Martin.

When conducted using established tools and processes, OUE enhances C-130 availability by:

- predicting likely emergent work or complex procedures
- identifying expected long-lead parts
- optimisation of necessary maintenance tasks

Lockheed Martin Service Bulletin (SB) 82-788 advises all operators to carry out OUE for legacy C-130 Hercules aircraft.

OUE-driven maintenance life cycle optimisation



Operation

Complete [or update] OUE
Individual Aircraft Tracking
Fleet management
Operational Loads Measurement

Pre-maintenance planning

Identification of necessary maintenance
Identification of high probability non-routine maintenance tasks
Identification of high probability long lead

Maintenance

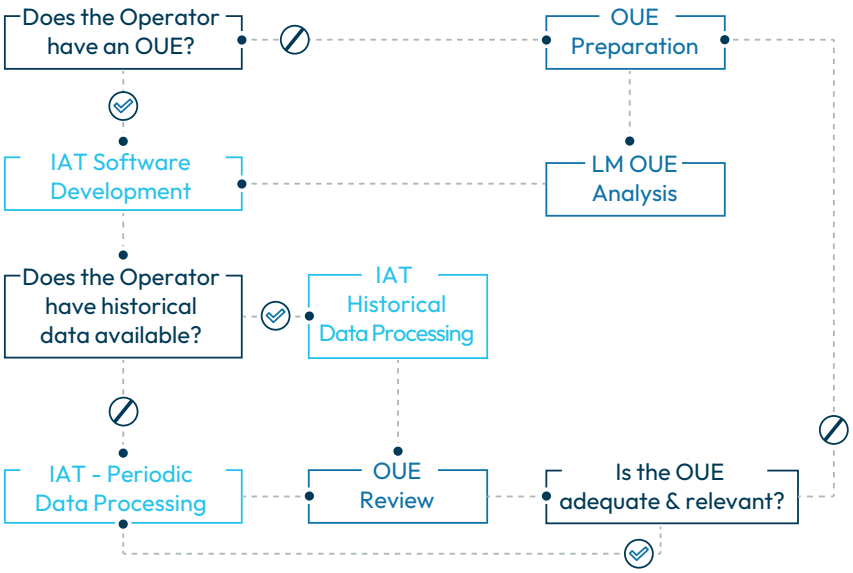
Complete maintenance
Trends identification (database)
Process improvement

The quality of OUE output depends on an organisation's ability to understand and carefully prepare input data before submission to Lockheed Martin. **Marshall Aerospace possesses mature and tested tools** to support and streamline the entire process of generating and updating OUE, and for reviewing and refining OUE outputs in concert with C-130 operators.

OUE outputs include aircraft life in Equivalent Baseline Hours (EBH) and usage severity factors. Since C-130 inspection thresholds and intervals are generally expressed in EBH terms, **high-quality OUE and usage monitoring** provides an accurate basis for determining necessary maintenance activity.

OUE Implementation and Ongoing Review

Regardless of whether an OUE approach is already in place or being adopted for the first time, we apply a **thorough but straightforward** flow process to understand the needs of each operator and identify where support is necessary.



Several common factors contribute to ineffective usage monitoring:

- Older OUE no longer represents to current usage
- OUE input data for mission profiles does not fully represent aircraft usage
- OUE uses a fleet average severity basis, ignoring variation across individual aircraft or sub-fleets

Marshall Aerospace recommends **tri-annual review** of C-130 flight data and usage trends to ensure that OUE continues to provide an accurate basis for forecasting fatigue life accrual. Alongside this, improved forecasting can be achieved through **Individual Aircraft Tracking (IAT)**, which applies mission-based usage severity factors on an aircraft-by-aircraft, flight-by-flight basis.

We have developed in-house processes and tool suites to **remove the complexities of IAT activity** for operators, while continuing to provide periodic OUE review and ongoing fatigue usage reporting. Together, these provide basis for proactive fleet management and maintenance planning.

About Marshall Aerospace

Established in 1909, Marshall is a British engineering specialist with a rich heritage and an enduring commitment to serving governments and prime contractors.

As a global leader in military maintenance, repair and overhaul (MRO), we work closely with aircraft operators to keep their fleets mission-ready and mission-capable. We have supported the C-130 Hercules since 1966, earning multiple world-first accreditations, permissions and accolades for our excellence on the platform.

Our approach to OUE combines tools and processes developed by Marshall and Lockheed Martin, which together have already demonstrated availability benefits for fleet operators.

Austrian Air Force (C-130K)

- Implemented individual aircraft tracking (IAT).
- Conducted historical data processing.
- Reviewed OUE and identified areas of improvement (including fleet management).

UK Royal Air Force (C-130K & C-130J)

- OUE provided under an integrated operational support framework.
- Increased availability by 33%.
- Delivered cost savings of 20%.

For more information please contact the Marshall sales team

marshallgroup.com