

Maintenance Management



Intergraph's Maintenance Management solution incorporates the concepts of Maintenance Steering Group (MSG-3) and Performance-Based Planning and Logistics (PBP&L). Implemented by experienced Intergraph professionals, our dual solution reduces maintenance costs, maximizes program efficiency, and extends the life of aging aircraft.

WHY USE MSG-3?

Military aircraft maintenance teams face challenges in controlling maintenance costs and maximizing efficiency. Many Air Force and Army weapons systems are more than 20 years old and will remain in service into their fourth or fifth decade of life. Without proper maintenance, aircraft reliability and availability plunge, the cost to maintain them soar, and safety is compromised. MSG-3 analysis is a rigorous, structured process that identifies optimal scheduled inspection tasks and intervals for aircraft maintenance. By adopting the MSG-3 methodology and applying it to aging Air Force and Army weapons systems, Intergraph helps precisely schedule maintenance to ensure equipment is always available on demand.

MSG-3 was developed as commercial aviation's version of Reliability Centered Maintenance (RCM). MSG-1 was originally designed in 1968 by the Air Transport Association (ATA) to build scheduled inspection programs for new commercial aircraft. In 1970, MSG-2 removed specific Boeing 747 terminology for use on other aircraft. Like MSG-1, MSG-2's philosophy was parts-driven, bottom-up, and process-oriented. By 1979, aviation experience and events drove sweeping changes in the methodology, resulting in MSG-3. Still exclusively used by commercial aviation today, MSG-3 is system-driven, top-down, and task-oriented. It employs a lean set of building-blocks consisting of zonal/enhanced zonal, general visual, detailed visual, and non-destructive inspections. Coupled with a hierarchical inspection/check process, the process ensures that higher-level tasks include all lower-level requirements.

Intergraph MSG-3 engineers have adopted this methodology to work with weapon systems managers to gather empirical data – technical knowledge, failure data, engineering reports, and other pertinent facts – and incorporate this information during the MSG-3 analysis process. Our MSG-3 approach considers the inherent reliability and safety impact of every aircraft component by incorporating proactive and preventative scheduled inspections into the aircraft maintenance program. These inspections are conducted at periodic intervals – when they are technically feasible, applicable, and economically justified, but always with safety and reliability as a top priority.

TESTIMONIALS

"MSG-3 is the 730th Aircraft Sustainment Group's top priority in order to increase C-5 reliability and maximize aircraft availability. MSG-3 will revolutionize how the Air Force maintains their aircraft."

Scott P. Vandersall
GS-15, DAF, Chief Engineer
730th Aircraft Sustainment Group

Since MSG-3 analysis, Bombardier reported a 35 percent reduction in total maintenance costs in the Challenger 601-3A program.

"We're going to put the G-IV on a MSG-3 program, which will save another 20 percent in maintenance costs..."

Larry Flynn
Senior Vice President of Aircraft Sales

ENHANCED RELIABILITY WITH PBP&L

To maximize maintenance improvements, an organization must implement a robust reliability program to monitor and trend aircraft discrepancies. Tracking degradation is crucial to maintaining reliability and properly regulating a MSG-3-based program.

Intergraph designs reliability programs to proactively support dynamic MSG-3-based maintenance programs. Our analysts use Intergraph software to ascertain negative trends or problem areas linked with specific aircraft within the fleet. Once analysts identify a problem area, they conduct extensive research to identify and correct downward trends in reliability. We identify all resources, manpower, and support equipment needed in advance so the aircraft can be repaired at the best time to reduce aircraft downtime. Using cost-benefit analysis, we investigate all possible solutions or repairs, ensuring we recommend only the most economical and effective solutions to our customers. After repair or process improvements occur, our analysts continue to monitor and track system health to ensure the implemented solution improved and returned reliability back to the aircraft's inherent design levels.

MSG-3/PBP&L PROGRAM BENEFITS

Through our MSG-3/PBP&L Programs, Intergraph provides our customers with a logical framework for scheduled maintenance plans that maintain airworthiness at lower costs. We help determine the precise timing of all applicable scheduled maintenance actions, ensuring assets will be available when needed. Benefits include:

- Provides a reliable, substantiated, and defensible maintenance program
- Complies with U.S. Air Force operational safety, suitability, and effectiveness
- Provides a maintenance program based on ATA MSG-3 scheduled maintenance development

- Follows appropriate inspection intervals determined by MSG-3 methodology
- Incorporates a hierarchical inspection convention with established ATA MSG-3 inspection criteria
- Identifies all structurally significant and maintenance-significant items
- Ensures previously missed items are included and eliminates insignificant inspections
- Uses commercial "best practice" work cards for consistent and effective task accomplishment

INTERGRAPH SOLUTIONS AT WARNER ROBINS AIR LOGISTICS CENTER

The U.S. Air Force Materiel Command (AFMC) continuously faces the challenge of keeping weapons systems mission-ready. To help meet this challenge, Warner Robins Air Logistics Center partnered with Intergraph to streamline depot maintenance processes for C-5 and C-130 aircraft using lean aerospace initiatives and total quality management techniques. As part of this effort, Intergraph and Warner-Robins developed a new inspection system for the C-5 weapons system using MSG-3 methodology. This new condition-based maintenance approach extended the life of these aging aircraft, resulting in operational cost-avoidances of approximately \$4.6 billion.

ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph's industry-specific software to organize vast amounts of data into understandable visual representations and actionable intelligence. Intergraph's software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I).

Intergraph PP&M provides enterprise engineering software for the design, construction and operation of plants, ships and offshore facilities. Intergraph SG&I provides geospatially-powered solutions to the defense and intelligence, public safety and security, government, transportation, photogrammetry, utilities, and communications industries.

For more information, visit www.intergraph.com.

