

NGRAIN® 3D SOLUTIONS IMPROVE OPERATIONAL PERFORMANCE BY 30%



PROJECT	GREENLEY & ASSOCIATES EVALUATION OF INTERACTIVE 3D
CLIENT	CANADIAN AIR FORCE
KEY OBJECTIVES	<ul style="list-style-type: none"> ▶ IMPROVE OPERATIONAL PERFORMANCE ▶ REDUCE TIME TO PERFORM MAINTENANCE AND REPAIR TASKS ▶ IMPROVE PROFICIENCY OF TASK COMPLETION

and attrition of skilled maintenance personnel resulting in a shortage of experience maintenance personnel.

To resolve both issues, the Air Force evaluated the effectiveness of implementing a networked lifecycle management system that would transform current maintenance programs by including fully interactive NGRAIN 3KO®s (3D Knowledge Objects™) to visualize parts information.

BACKGROUND

Greenley & Associates, an independent consulting firm specializing in human factors, was commissioned by the Canadian Air Force to conduct an independent study on the use of interactive 3D in facilitating air technician maintenance operations and procedures. The study set to determine the effectiveness of using NGRAIN’s interactive 3D solution in improving operational performance by reducing the work and duration of common lifecycle management tasks such as parts maintenance and repair.

CHALLENGE

The Canadian Air Force is faced with two challenges: the need to automate lifecycle management tasks to improve the process of developing, procuring, and sustaining each aircraft;

SOLUTION

The first phase of the program was to provide quantitative proof that 3D visualization of equipment provides benefits to maintenance, service, and repair tasks. The expectation was that the use of interactive 3D visualization would allow more efficient comprehension and communication of parts information, and improve critical maintenance procedures and training. The result being savings in time and effort, fewer errors, and a reduction in associated costs over the life of the aircraft.

To provide quantitative proof, the Air Force commissioned Greenley & Associates to conduct a study that would determine the improvements to common lifecycle management activities that could be realized by using NGRAIN’s interactive 3D maintenance training solution as part of a networked enterprise platform.

IMPLEMENTATION

To assess NGRAIN's benefits, the study evaluated the conduct of specific tasks in an experimental scenario using the current Canadian Forces accident investigation methodology. The study set out to track the tasks involved in investigating and resolving an incident to determine if the integration of interactive 3D visualization provided qualitative and quantitative benefits to performing the tasks.

The scenario involved a number of tasks representative of all necessary actions resulting from a helicopter accident. The tasks were selected with the aid of a subject-matter-expert and included: a technical investigation, transfer of information across multiple organizations, parts disassembly and inspection, and the creation, implementation and dissemination of a part modification.

The study made use of a 3D model of a CH-146 Griffon helicopter tail rotor assembly. NGRAIN software was used to visualize parts, animate parts disassembly procedures, and attach meta-information to parts by linking to tech orders, inventory data, training modules, and service bulletins.

The task performance results were evaluated using five parameters:

1. The amount of work required to do the task
2. The level of understanding of the intent of the task
3. The likelihood of information being lost or misplaced
4. The likelihood of an error in the task
5. The long-term durability of the information

RESULTS

The study found that NGRAIN's 3D maintenance training solutions reduce the total number of work hours required to investigate and resolve a maintenance incident by 30 percent. When NGRAIN interactive 3KOs are integrated in the lifecycle management system, task work decreases from 119 hours to 82 hours.

The study also demonstrated that the inclusion of NGRAIN interactive 3D improves the quality of task performance significantly. The study showed a 16-31 percent improvement across the five evaluation criteria when compared to traditional methods.

An additional outcome of the study was that NGRAIN provides significant benefits in task training and is a more effective way of sharing the knowledge of retiring subject-matter-experts across the enterprise.



CH-146 Griffon Helicopter