Case Study

INDEPENDENT STUDY DEMONSTRATES A 30% IMPROVEMENT IN OPERATIONAL PERFORMANCE USING NGRAIN'S INTERACTIVE 3D SOLUTION FOR MAINTENANCE TRAINING

BACKGROUND

In March 2004 the Canadian Air Force commissioned an independent scientific study by Greenley & Associates 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 typical life cycle management tasks such as parts maintenance and repair.

CHALLENGE

The Canadian Air Force is faced with two challenges: the need to automate life cycle management tasks to improve the process of developing, procuring, and sustaining each aircraft; and attrition of skilled maintenance personnel that will reach a critical level by 2010.

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

> *"The use of NGRAIN in a networked enterprise solution vastly improves tasks involved in life cycle management activities."*
>
> *- Greenley & Associates Report for Canadian Air Force*

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. Specifically, 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.

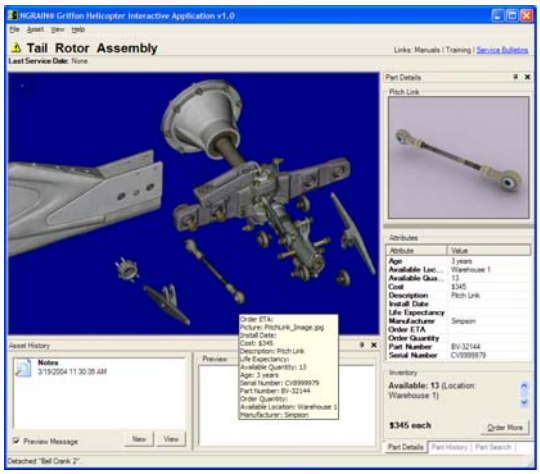
To provide quantitative proof, the Air Force commissioned a study by Greenley & Associates, an independent consulting services provider that specializes in Human Factors - the science of how well humans can learn, use, and exploit technological advances. The study's goal was to determine the improvements to typical life cycle management activities that could be realized by using NGRAIN's interactive 3D maintenance training solution as part of a networked enterprise solution.

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.

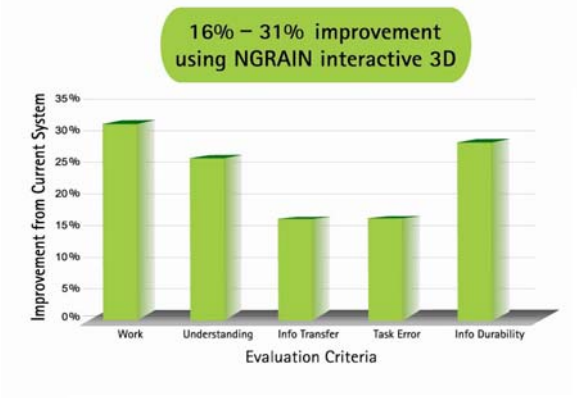
The scenario involved a number of tasks representative of all necessary actions resulting from a helicopter accident. The tasks were selected with the aid of a subject matter expert and included: a technical investigation, transfer of information among multiple organizations, parts disassembly and inspection,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

The study made use of a 3D model of a CH146 Griffon helicopter tail rotor assembly. NGRAIN's 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.



NGRAIN 3D Knowledge Object of Griffon helicopter tail rotor assembly

The task performance results were evaluated using five parameters: (i) the amount of work required to do the task, (ii) the level of understanding of the intent of the task, (iii) the likelihood of information being lost or misplaced, (iv) the likelihood of an error in the task, and, (v) the long-term durability of the information.

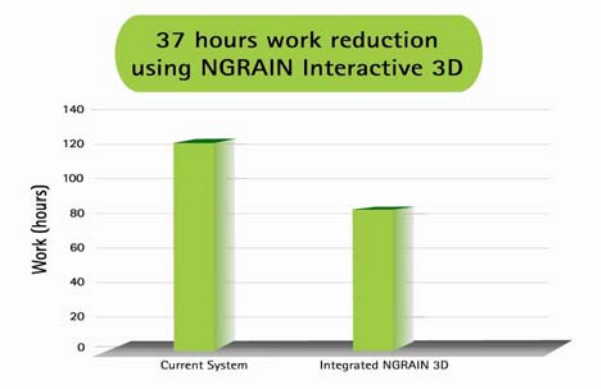


RESULTS

The study found that NGRAIN's 3D maintenance training solution reduces the total number of work hours required to investigate and resolve a maintenance incident by 30%. When NGRAIN interactive 3D Knowledge Objects are integrated in the life cycle 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 five evaluation criteria showed 16% to 31% improvements over 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.



To receive a copy of the report "*Evaluation of NGRAIN 3D Visualization Software and Future Enterprise Application in the LCMM Role*", please contact publications@ngrain.com.

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