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OFFICE OF THE SECRETARY

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The Honorable J. Randy Forbes
307 Cannon House Office Building
U.S. House of Representatives
Washington, DC 20515-4604

Dear Mr. Forbes

This is in response to your joint letter with Representative Ortiz, dated January 29, 2008, concerning the use of modeling and simulation in the operations and maintenance of Air Force aviation assets. I too share your concern with regards to sustaining and maintaining our aging aircraft fleet, and want to assure you that we are using all available means to include modeling and simulation in ensuring airframe safety and the airworthiness of our fleet.

The following answers are provided to the specific questions you raised:

1) Are modeling and simulation tools being used to predict structural failures or other problems with your legacy aircraft fleets?

Yes, structural models, such as finite element models, and analytical tools are widely used to predict the strength and life of airframe structures. During system development, these models are calibrated using data from ground and flight tests. These models and tools are periodically updated to reflect the most current usage of aircraft in the fleet. Airframe safety and airworthiness is managed via robust inspection programs and fleet usage tracking.

2) Are your legacy aircraft fleets equipped with adequate monitoring and data collection systems to support modeling and simulation capabilities that currently exist?

Most legacy systems have some form of data collection system, but discrepancies exist in the systems employed and the quality/quantity of data collected. With the exception of recently developed systems, such as the C-17, F-22, and F-35, every legacy system has some deficiencies in usage monitoring, structural modeling, definition of current damage state, and on-board damage event monitoring. Like many areas in the Air Force, we could wisely invest additional funds in this area to mature advances in sensor technology that would aid in eliminating these deficiencies.

3) Have modeling and simulation tools enabled manufacturers to incorporate lessons learned into their aircraft designs to improve quality and reduce failure rates?

Yes, prime contractors utilize a wide variety of commercial, proprietary, and classified modeling and simulation tools to improve design performance and reduce both manufacturing and operating costs. These tools are continuously refined with data gathered both during testing and

operational usage to improve aircraft reliability. Modeling and simulation technology advances, such as three-dimensional modeling, computational fluid dynamics, and ever increasing model fidelity, have enabled significant improvements in manufacturing quality and in aircraft performance.

4) Are new acquisitions, such as the F-22 and F-35, equipped with the necessary tools to enable modeling and simulation support for life-cycle sustainment?

Yes, program offices, partnering with their prime contractors, have many tools available during development – to include those needed to enable modeling and simulation support – to predict sustainment requirements. Field data such as spares consumption, and system reliability and maintainability, acquired from operations are used to refine the sustainment toolset and requirements over the life-cycle of the weapon system.

5a) What role do simulators play in meeting aircrew training requirements?

High fidelity Mission Training Centers (MTC) enable us to accomplish certain tasks that might be unsafe, too expensive, or otherwise impractical to do in actual aircraft—surface-to-air missile defense, combat scenarios in which we are severely outnumbered, and homeland defense over populated areas are just a few examples. For F-15C units with MTCs, up to 24 percent of training requirements may be accomplished in the MTC. MTCs provide a great tool for augmenting flight training, but they cannot completely replace actual flying.

5b) Was there increased reliance on F-15A/B/C/D simulators when the fleet was grounded?

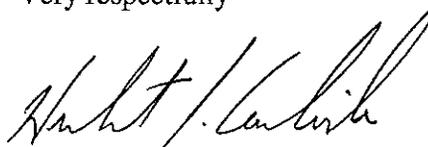
The F-15C MTCs were used at an increased rate with over 118 additional surge hours used by the units during the stand down. Additionally, some units decreased the duration of their training periods from one and half hours to one hour, thus allowing them to have up to eight additional cockpits available per day. At some bases, usage rates were up to four times higher than normal.

5c) How will simulators be used as you go about requalifying pilots after the extended downtime?

Air Combat Command pilots will complete an emergency procedure mission in the MTC prior to their first flight. Pilots will continue to use the MTC to the maximum extent possible for tactical proficiency, Ready Aircrew Program training, emergency procedures, and upgrade missions.

Your interest in the safety of the Air Force's legacy aircraft fleet is greatly appreciated and I trust the information provided is useful. A similar letter has been sent to Representative Ortiz.

Very respectfully



HERBERT J. CARLISLE
Major General, USAF
Director, Legislative Liaison