



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

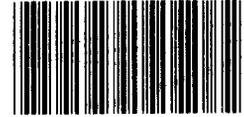
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PROCUREMENT, LOGISTICS,
AND READINESS DIVISION

APRIL 22, 1983

B-207202

The Honorable Verne Orr
The Secretary of the Air Force



121223

Dear Mr. Secretary:

Subject: Savings Can Be Made By Using Compressed Air When
Testing Aircraft For Fuel Leaks (GAO/PLRD-83-69)

In July 1982 we reported to the Congress the results of our review of Department of Defense aircraft engine thrust/power management. ^{1/} In that review, we found that large amounts of aviation fuel could be saved if compressed air in lieu of engine runups were used to check for fuel leaks when external fuel tanks were attached to Tactical Air Command (TAC) F-4 aircraft. Because the needed air compressors were not authorized for TAC's F-4 air wings, compressed air tests could not be made even though they were authorized. Navy maintenance practices for F-4 aircraft fuel leak tests require the use of compressed air whenever possible.

At our request, TAC evaluated the compressed air testing procedure and found that it would save \$668,750 in fuel annually. TAC's evaluation also showed that using compressed air takes significantly less time, reduces the amount of labor needed, and reduces the risk of foreign object damage to other aircraft in the vicinity. TAC has informed other Air Force commands that operate F-4 aircraft of these results. As a result, compressors have been authorized for all TAC F-4 aircraft maintenance units.

^{1/}"Aircraft Thrust/Power Management Can Save Defense Fuel, Reduce Engine Maintenance Costs, and Improve Readiness" (GAO/PLRD-82-74, July 29, 1982).

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We are writing you now because we believe other Air Force commands with other types of aircraft need to investigate the application of compressed air in lieu of engine runups. You also may want to inform our allies, particularly those that operate F-4 aircraft, of the savings that can result from using compressed air to test for fuel leaks.

BACKGROUND

When external fuel tanks are installed on aircraft, maintenance personnel must test for fuel transfer and leaks. The F-4 technical order requiring the test permits using either an engine runup or external compressed air to provide the pressure.

At Seymour Johnson Air Force Base, North Carolina, maintenance personnel said they routinely used engine runups because the equipment allowance list did not include an air compressor of the necessary size.

The normal practice was to run one engine on the aircraft at 85-percent power for about 15 minutes to transfer fuel and make the test. We were told that an air compressor of the MC-7 type would not only save the fuel consumed during an engine runup but save time and reduce the labor needed to do the test. We were also told that external tanks were reinstalled about 468 times a year at the wing and that about 187 gallons of fuel was consumed for each test.

SUCCESSFUL EVALUATION

In December 1981, we asked TAC to evaluate the compressed air test procedure to determine its cost effectiveness and applicability to other aircraft. The TAC Deputy Chief of Staff for Logistics responded that, while this procedure looked promising, a 6-month test would be conducted at Seymour Johnson Air Force Base to identify potential savings and problems. On November 9, 1982, he reported that the test had been completed with very successful results. Test data provided to us showed that the air compressor was used 274 times, the average test time was a little over 11 minutes, and \$57,700 of fuel was saved. In its last status report on the test, the wing at Seymour Johnson stated that "the MC-7 air compressor has proven to be very cost and time saving for F-4 leak and transfer checks and fuel system transfer problem troubleshooting."

Seymour Johnson maintenance officials identified additional benefits of using compressed air over engine runups:

- The time needed to troubleshoot and/or prepare aircraft for flight when external fuel tanks are installed is significantly reduced.
- It eliminates the need for an engine-run qualified aircrewman for at least 1 hour for each test.
- The reduction in engine run time reduces engine maintenance costs.
- It reduces the risk of foreign object damage.

Based on the test results, TAC obtained approval for the addition of MC-7 air compressors to its F-4 squadrons' equipment allowance list. Although usage will vary among squadrons because of different F-4 models and training missions, TAC estimates that it will save \$668,750 a year just in fuel. The first year savings would be \$487,350 after deducting the cost of the 25 MC-7 air compressors, \$7,256 each.

TAC also notified all other U.S. Air Force commands that operate F-4 aircraft of the air compressor test results. The National Guard Bureau and the Air Force Reserve were included in the notification. In addition, TAC is currently testing the use of the compressed air procedure on its F-15 and F-16 aircraft.

CONCLUSION AND RECOMMENDATION

TAC has evaluated the use of compressed air to test F-4 aircraft for fuel leaks. Implementation of this procedure has resulted in substantial fuel savings and other maintenance benefits. Therefore, we recommend that you investigate the applicability of this fuel leak test procedure to all commands with aircraft that use removable external fuel tanks. We also recommend that you inform our allies, particularly those that operate F-4 aircraft, of the fuel and other maintenance savings that can result from using compressed air to test for fuel leaks.

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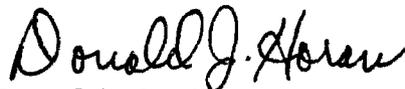
As you know, 31 U.S.C. § 720 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for

B-207202

appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Secretaries of Defense, the Army, and the Navy; the Director, Office of Management and Budget; the Chairmen of the above-named committees and of the House and Senate Committees on Armed Services.

Sincerely yours,

A handwritten signature in cursive script that reads "Donald J. Horan".

Donald J. Horan
Director