

Appendix I

Navy Letter to Congress on F-14 Poly-X Wiring Problems June 2, 1997

- Notes that 323 F-14s had Poly-X wiring, **Para. 4.**
- Notes that Poly-X caused maintainability and readiness problems, necessitating replacement of critical wires, sometimes with Raychem 55, **Para. 3.**
- Claims there is no documented F-14 safety wiring problem any more, **Para. 8..**



DEPARTMENT OF THE NAVY
PROGRAM EXECUTIVE OFFICER
TACTICAL AIRCRAFT PROGRAM
1421 JEFFERSON DAVIS HWY
ARLINGTON VA 22243

IN REPLY REFER TO
2 June 1997

The Honorable James C. Greenwood
House of Representatives
Washington, DC 20515-3805

Dear Mr. Greenwood:

Thank you for the opportunity to respond to Mr. Ed Block's recollection of the April 10, 1997 meeting. However, we understood that the groundrules established at the beginning of this meeting were that no official minutes were to be recorded. Therefore, we were disappointed to learn that portions of Mr. Block's notes had become available to the media. Consequently, I believe it is important that you have the Navy's position on this issue as it relates to the F-14 aircraft.

Three types of wiring have been used in the F-14, MIL-W-81044/16-19 (Poly-X), MIL-W-81381 (Kapton) and MIL-W-22759/32-/35 and /41-/46 (Spec 55). Poly-X wiring, based on a polyimide type material, was the original wiring used in F-14 production. In 1976, Raychem discontinued manufacturing Poly-X and the Navy began phasing in Kapton wiring into aircraft production. Spec 55 wiring was developed by Raychem in 1977 but a 1978 study comparing Kapton and Spec 55, indicated that these wires were approximately equivalent but that Kapton was lighter. Based on this study, a decision was made to continue phasing Kapton wiring into production, while using up Poly-X on hand.

During the mid to late 1970's, the Navy experienced significant maintainability problems and a reduction in combat readiness due to Poly-X wiring. Poly-X wiring was found to be deficient in the operating environment of the F-14. Specifically, high humidity and high pH based aircraft cleaning solutions caused the wire insulation to crack which increased the potential for electrical failures. Because of these problems, Poly-X was prohibited from being used in certain critical harnesses in Severe Wind and Moisture Problem (SWAMP) areas. By the time Poly-X was completely phased out of production aircraft, 337 F-14 aircraft had been produced.

In 1979, the Navy proposed an extensive retrofit program to completely replace Poly-X wiring with Kapton wiring in 323 (out of the first 337) aircraft. Total cost estimate was \$354M; but this was never appropriated by Congress. (The \$354M figure was referred to by Mr. Block during the April 10, 1997 meeting.) Instead, a wiring modification program costing \$26M was implemented from 1982 through 1989, which involved replacing Poly-X and Kapton wiring with Spec 55 in critical SWAMP areas as well as the incorporation of anti-chafe protection and water intrusion prevention.



The rewire with Spec 55 was required due to continuing maintainability and durability problems with Poly-X and the emergence of similar problems with Kapton in SWAMP areas. This decision was reinforced by two studies conducted in 1981 that indicated that both wire types, based on polyimide materials, had similar properties and were not the optimum choice for use in naval aircraft because the wire insulation was susceptible to stress, chaffing and breakdown. The different chemical composition of Spec 55 wiring coating solved many of the problems inherent with Poly-X and Kapton wiring. Based on these studies, the Naval Air Systems Command issued policy guidance in 1981, stating that Spec 55 was the preferred wiring for use in naval aircraft for all rework and repair actions.

During the April 10, 1997 meeting, the Navy stated that there are no F-14 aircraft currently flying with Poly-X wiring. That statement, which was based on limited data we were able to gather shortly before the meeting, was incorrect. In fact, there are currently 45 active aircraft with some Poly-X. However, these aircraft have received the Spec 55 update to critical wiring harnesses. Of the remaining 337 aircraft that were originally produced with Poly-X wiring, 91 were placed in storage at Davis-Monthan Air Force Base because their useful fatigue life had expired or because they were considered excess inventory and represent war reserve. These aircraft were not placed in storage due to problems with Poly-X wiring as alleged by Mr. Block.


There are currently 295 F-14 aircraft actively flying today. Of these, 45 contain some amount of Poly-X wiring, 161 contain a mix of Kapton and Spec 55 wiring and 89 are completely Spec 55 wired. All aircraft have Spec 55 in critical wiring harnesses. As stated during the April 10, 1997 meeting, the F-14 has not experienced a wiring safety issue.

In summary, there is no documented wiring safety issue in the F-14. No grounding bulletins have ever been issued due to wiring problems. The Navy identified a maintainability problem with both Poly-X and Kapton wiring in certain critical harnesses in F-14 aircraft. This was corrected by switching to Spec 55 wiring in production and retrofitting critical harnesses in previously manufactured aircraft through a wiring improvement program.

The Navy recommends that this issue be closed from an F-14 perspective.

I hope this information will be useful to you. If I may be of further assistance, please let me know.

Sincerely,


J. A. COOK
Rear Admiral, U. S. Navy