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PRATT & WHITNEY AIRCRAFT

DIVISION OF UNITED AIRCRAFT CORPORATION

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May 25, 1965 CNLN-6307

Mr. W. H. Woodward
National Aeronautics and
Space Administration Headquarters
Washington, D. C.

Subject: ANP Powerplant Data

Reference: Telephone Conversation, R. M. Meyer to W. H. Woodward, May 17, 1965

Dear Bill:

I have enclosed two figures which summarize a comparison of our ANP program powerplant which used four J-58 (JTN-11) turbojet engines with an identically similar powerplant, except for the engines which are four STF-200 turbofan engines. It is interesting to note that the fan engine powerplant gives a 100 percent increase in thrust with a decrease of 33 percent in reactor power. The weights in the two cases are the same.

The NJ-18A powerplant was the reference design indirect cycle powerplant which we were working on at the time the ANP program was canceled in 1961. This powerplant utilized two 200 Mw lithium-cooled columbium-1 zirconium reactors which supplied heat to a lithium-to-NaK heat exchanger. The NaK delivered heat to NaK-to-air radiators in the engines at a temperature of 1600°F. The reactor outlet temperature was 1800°F. The powerplant lifetime was 1000 full power hours. The reactor was based on UO_2-BeO fuel.

The NJ-18A powerplant was being designed to power the Convair MX-2 airplane which was to have a gross weight of 467,000 pounds. A split shield concept was used and the irradiation dose to the crew was limited to 0.02 rem/hour. The shield weights were computed to be as follows:

Shield for the reactor	40,200 lbs
Crew shield	34,100 lbs
Total shield weight	74,300 lbs

The reactor shield was to be of lithium hydride and depleted uranium. It was planned to use Santowax for the shield coolant fluid.

If you have further questions on our ANP program studies, please call me.

Very truly yours,

PRATT & WHITNEY AIRCRAFT

R. M. Meyer

RMM:gh
Enclosures