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EDWARD A. NEU, JR. (1920-1963) – THE CREATOR OF THE "SPAGHETTI" ROCKET
COMBUSTION CHAMBER, A BIOGRAPHICAL SKETCH

Abstract

From about 1947, the young rocket engineer of America's first liquid-fuel rocket company, Reaction Motors, Inc. (RMI), Edward ("Ed") A. Neu, Jr., conceived and help developed what was then called the "spaghetti" rocket chamber that was an ingenious technique of regenerative cooling in which the fuel was allowed to circulate around the motor prior to entering the chamber and igniting with the incoming oxidizer; that is, the motor wall itself consisted of dozens of cooling wall tubes that also served to greatly lighten the motor. Moreover, this form of regenerative cooling of rocket motors was highly effective and lasted throughout the entire firing duration. Neu's advance was also well proven in some of RMI's early motors testing the technique and very rapidly it became adopted by other U.S. companies developing rocket motors.

Notably, for instance, North American Aviation, Inc., then developing large-scale liquid-fuel boosters for their ramjet-powered Navaho missile, soon adapted this design for the boosters. Subsequently, their later Rocketdyne Division (formed in 1955) went on to develop a succession of other large-scale rocket engines featuring what they preferred to call "tubular chambers" for such missiles as the Jupiter, Thor, and Atlas. Indeed, Neu's concept was particularly suitable for the cooling and weight reduction of large-scale engines. In fact, Rocketdyne's engines with this feature continued to evolve up to all the large engines for the Saturn V launch vehicle that took men to the Moon under Project Apollo, then was followed by the RS-25 engines for the Space Shuttle. Presently, Aerojet Rocketdyne's RS-25 engines, which incorporates additional highly significant technical improvements, now serves as the main power plant for the Artemis project's Space Launch System (Space Launch System) vehicle that is planned to reestablish a human presence on the Moon for the first time since the Apollo 17 mission in 1972, the crewed Artemis 2 scheduled for launch in 2024.

This paper is thus the first biographical sketch of the U.S. rocket pioneer who was responsible for originating this now fundamental and long established key component of practically all modern U.S. large-scale rocket engines and will be based upon extensive research by the principle author (Winter) on the history of RMI, besides material provided by Neu's former co-workers, and his daughter, Nancy (Neu) Hom, and other sources.