

**James Kleigel**  
**Independent Consultant**



James R. Kleigel received a B.S. degree in Applied Chemistry from the California Institute of Technology in 1953. He received a Master of Science degree in Chemical Engineering in 1956 and a Doctor of Philosophy degree in Mechanical Engineering in 1959 both from the University of California at Berkeley. He worked at Space Technology Laboratories (TRW) from 1958 to 1967 directing major staff support for technical direction of all propulsion contractors supporting USAF Ballistic Missile Development Programs, Was principle analyst and program manager leading development of first successful coupled two phase flow solid rocket nozzle analysis and performance prediction computer program. Had major design responsibility for Apollo lunar landing engine. Responsible program manager for development of JANNAF sponsored One Dimensional Kinetic (ODK) and Two Dimensional Kinetic (TDK) liquid rocket nozzle performance analysis computer programs. Modern versions of all of these CFD nozzle performance analysis programs are still utilized throughout the rocket industry. Has worked over 50 years in solving combustion related design/operating and air pollution emission problems associated with rockets and utility power generation equipment