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HISTORICAL LESSONS OF THE ORION AND NERVA PROJECTS: MANAGING PUBLIC OPINION AND POLITICAL UNCERTAINTY IN SPACE PROGRAMS

Abstract

This oral session will examine the history of the Orion program and the NERVA nuclear engine within the Integrated Program Plan, the technical reasons for their study, their progress, and the political reasons for their cancellation. Whether pulsed or thermal, nuclear propulsion offers the best compromise in efficiency and thrust for the propulsion of future manned missions. The Orion project was born in the mind of Stanislaw Ulam, an atomic physicist who had worked on the Manhattan project. Despite theoretical performances superior to anything conceivable even with current technologies, and despite the mobilisation of some of the most brilliant physicists of the time (Freeman Dyson), the project was killed by the Treaty banning nuclear weapon tests in the atmosphere, in outer space and under water (Moscow, 5 August 1963). The Integrated Program Plan was Wernher von Braun's proposal to the Space Task Group (STG), chaired by Vice President Spiro Agnew, for the continuation of the Apollo program. This plan envisaged a lunar base in the 1970s, and a first manned mission to Mars in the early 1980s. All of this would have been powered by nuclear-powered orbital shuttles, using NERVA, a nuclear engine tested and operational since 1968. Here again, despite the fact that it performed better than anything else in the world, even today, the project failed politically. This retrospective therefore aims to answer three questions:

• How was nuclear technology envisaged as a propulsion system during the space race? • What international political and legal issues has the use of nuclear energy as a means of propulsion been confronted with? • How can nuclear space programs of today and tomorrow be protected from the uncertainties of this influence?

The study of propulsion systems is very often left to engineers, and political and public relations issues to politicians. However, every technology is the result of a political system, and has a strategic impact, which is a subject for social and political sciences. History can be the academic bridge between political and technical studies.