SPACE POWER SYMPOSIUM (C3)
Space-Based Solar Power Architectures / Space & Energy Concepts (1)

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USING RESOURCES ON ASTEROID FOR MANUFACTURING OF SSPS–A NEW ATTEMPT AND ITS POTENTIAL

Abstract

SSPS has been studies for almost 50 years, still there are lot of challenges in its development. Up to now, there are mainly two means for construction of GEO SSPS. One is to build everthing ready on ground, and launch all the units with heavy-duty launch vehicles either expendable or reusable. Another one is to build most of the unit on lunar surface using the in-situ resources for SSPS manufacturing and propellant extraction. The first one will meet a great challenge for mass launchs which affect its cost-effectivess. The second one will also need additional ΔV for transfer from lunar surface to GEO.

In this paper, a new stategy has been suggested using the same technology of in-situ manufacturing on lunar surface, but with a different target or resources–the Near Earth Asteroids. NASA has already planned a mission for NEO which may be a basis for such a strategy. The comparison of these three senarios has been made in terms of technology readiness and its relative cost.

Also in this paper, some new progress in SSPS in China is also introduced.