

Using the ISS to Prepare for Exploration (01)
Poster Session (P)

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NUCLEAR POWER AS A POWERFUL SOLUTION IN SUPPORTING SYSTEMS AND MISSIONS
COMPONENTS FOR INTERNATIONAL SPACE STATION**Abstract**

Interest of mankind to explore deep space has clubbed various nations together International Space Station. It will be a platform in the space to support long range missions and to support astronauts to consider as a second home in space. In future, it is required to design deep space mission from the ISS directly with communication from earth. It will be fully functional in conducting various experiments with advanced systems under uninterrupted power supply. This paper will describe how to create on board Power generation systems to ISS using MHD systems with vapor core reactor systems. In this design, it describes about fission reaction under micro gravity conditions to create nuclear fission, as well as the control over the radiation and nuclear waste management in the space. This approach will concentrate more on thermodynamic feasibilities in creating a virtual power plant with the support systems possible in the space. In the ISS, presently we have support for the crew members below ten, which itself is taking good amount of power for creating oxygen from electrolysis as well as for removing carbon dioxide, and other gases like ammonia and acetone. When we increase handling capacity and also if we launch various experimental setups, even this requirement will double from the present existing capacity. This made us to concentrate in this paper to create such a system, which could actually support the future needs of the International Space Station with continuous power. The Major aspects of the power plant operation is to contaminate radiation coming from the reactor systems and also waste management will make design more meaningful. Even though modifications to the International Space Station may not be possible due to design limitations, this paper is written with the hopes that it will create a compass for further work in the area by addressing the energy production on a mass scale for a larger size space station. It is also hoped that this will create a stepping stone to the stars.