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Paper Session I-B - Development of a Lunar Consumables Storage and Distribution Depot

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Development of a Lunar Consumables Storage and Distribution Depot
Notardonato, Mueller, Johnson

NASA is in preliminary planning stages for a future lunar base as a response to President George Bush's recent announcement of a new exploration program beyond low earth orbit. Kennedy Space Center engineers are supporting this program by utilizing experience in Spaceport system design and operations to help develop a Lunar Consumables Depot. This depot will store propellants and life support fluids, either transported from Earth or manufactured from In Situ resources. The depot will distribute these consumables in an energy efficient manner to end users including spacecraft, habitation modules, and rovers. This paper addresses some of the changes to lunar base architecture design as a result of advances in knowledge of lunar resources over the past 35 years, as well as technology advances in the area of In Situ Resource Utilization and consumable storage and distribution. A general system level description of the depot will be presented, including overall design philosophy and high level requirements. Finally, specific subsystem technologies that have been or will be developed by KSC will be addressed. Examples of these technologies are automated umbilicals, cryogenic refrigerators, novel storage vessels, advanced heat switches and heat exchangers, and self healing gaskets and wires.