

Legal Issues Related to Space Exploration (13)
Specific legal issues of space exploration and exploitation (2)

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THE LEGAL LANDSCAPE AFTER NUCLEAR SPACECRAFT REENTRY AND CONTAMINATION:
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Abstract

By the time the 2012 Global Space Exploration Conference (GLEX) convenes, we will know whether the Phobos-Grunt spacecraft, currently suspended in a disintegrating Earth orbit with 12 tons of toxic fuel onboard, was consumed upon reentry or froze, spilled and contaminated Earth upon impact. History will also record the now-prospective launch of NASA's Mars Science Laboratory (MSL), which hosts a rover named Curiosity powered by 10.6 pounds of radioactive plutonium. Though the contribution of the Grunt and the Curiosity to the field of environmental contamination may be known by the time of the GLEX Conference, there will always be future missions that hold still further risks for environmental contamination as one or more fail in their quest to seek information about our universe and fall back to Earth. Whether the Grunt or Curiosity is among them is a transient worry in the grand epoch of space exploration. Because of previous nuclear powered space mission accidents that resulted in plutonium dispersal upon reentry, NASA has had to address the odds for the probability of a release of plutonium from the MSL in its Final Environmental Impact Statement. Predictably, the odds are low (1-in-830 for the probability of a release of plutonium in an accident after attaining parking orbit; 1-in-420 for the probability of plutonium being released in a launch accident, etc.) but the damage estimates are enormous (decontamination costs of \$267 million for each square mile of farmland, \$478 million for each square mile of forests and \$1.5 billion for each square mile of mixed-use urban areas.) Many believe development into nuclear propulsion is necessary to enable the next era of space exploration and even now there are international discussions among the Russian Federation, NASA and the space agencies of France, Germany, China, and Japan) about building a next-gen, nuclear powered spacecraft engine by next year. Assuming nuclear power will become more commonplace in space exploration and acknowledging the enormous risks and inherent in the use of plutonium for space travel, this paper will seeks to provide a current analysis of broader issue of whether international law is sufficient to address environmental damages resulting from the unintended disintegration of nuclear products upon reentry.