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**AUTONOMOUS RENDEZVOUS TARGETING TECHNIQUES  
FOR NATIONAL LAUNCH SYSTEM APPLICATION**

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**ABSTRACT**

This paper describes the rendezvous targeting techniques that can be utilized to achieve autonomous guidance for delivering a cargo to Space Station Freedom (SSF) using the National Launch System's (NLS) Heavy Lift Launch Vehicle (HLLV) and the on-orbit Cargo Transfer Vehicle (CTV). This capability is made possible by advancements in autonomous navigation (Global Positioning System - GPS) on-board the CTV and SSF as well as the new generation flight computers.

This paper describes how the HLLV launch window can be decoupled from the CTV phasing window. The performance trades that have to be made to determine the length of the launch window and the phasing window between the CTV and SSF are identified and recommendations made that affect mission timelines.