U.S. Automated Rendezvous and Capture Review
Category 2 - Software Systems

Abstract Title: The Role of Smart Systems in Rendezvous, Close Proximity Operations and Docking Maneuvers

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Technical Details:

Various missions scenarios (Space Station logistics, LEO & GEO services and SEI operation) will involve flexibility in mission management. This means operations will be one or a combination of: autonomous, supervised autonomous and machine aided manual control. Smart Systems will likely play a significant role in making these missions successful from a safety/ reliability perspective, and less costly from an operations perspective. This does not imply that Smart Systems need to be super sophisticated. On the contrary, Smart Systems have been described as automated intelligence that if a man had done it wrong, it would be considered stupid. The first part of this paper will describe the types of Smart System techniques involved in AR&CC, their specifications, duties and interactions.

Next will be a discussion of the work performed at GD under the auspice of the ALS Program to further Expert Systems applications imbedded in the control process, NASA/JSC CRAD and other related IRAD projects. This will include issues pertaining to: integration, speed, knowledge encapsulation and cooperative systems.

Finally, a brief description will be offered to outline the major obstacles for the acceptance of Smart Systems in critical applications. Some progress to date in the industry in this regard. And current directions to surmount these problems.