

IPRO 326 – Fall 2004 – Final Abstract

**Hybrid Electric Vehicles:
Simulation, Design, and Implementation**

Sponsor: Not applicable.

Goals:

- Determine the optimum hybridization factor for parallel and series configurations of the Hummer model H2.
- Determine the optimum hybridization factor for parallel and series configurations of the HMMWV (High-Mobility Multipurpose Wheeled Vehicle) model M1097 A2.
- Simulate a hybrid electric bus system scheduled to have practical implementations in India by the end of next year, 2005.

Basic Organization/Tasks:

- ADVISOR Simulations to find the best Hybridization Factor for H2 and HMMWV parallel and series configurations.
- ADVISOR Simulations for a hybrid electric bus system meeting the India City Drive Cycle.

Findings/Conclusions:

- Hybrid H2 Research and Simulation:
 - Optimal HF for parallel configuration = 0.05 [Method 1] and 0.21 [Method 2]
 - Optimal HF for series configuration = 0.35 [Method 1] and 0.20 [Method 2]
- Hybrid HMMWV Research and Simulation:
 - Optimal HF for parallel configuration = 0.50 [Method 1] and 0.40 [Method 2]
 - Optimal HF for series configuration = 0.20 [Method 1] and 0.05 [Method 2]
- Hybrid BUS system Research and Simulation:
 - Optimal HF for parallel configuration = 0.35

Next Steps:

- Determine optimum HF for parallel and series configurations of new Hummer model H3, and compare results with values obtained for current H2.
- Continue research on the Hybrid Electric Bus System, and work on its practical implementation by end of next year, 2005.
- Optimize the Control Strategy utilized in this project.

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