

THE IMPORTANCE OF BATTERIES IN UNMANNED MISSIONS

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The author will present a brief overview of the current set of unmanned missions that are currently in operation and those planned for the next 5 to 10 years. In this discussion, the author will detail the important role that batteries have come to play in the development of successful missions.

The author will discuss the workhorse battery, the NiCd, and its use throughout historical missions. Its role on Observers and Landers will be discussed and the success those batteries had.

The author will also spend time discussing the recent events in the issues of quality and life for NiCd batteries. These discussions will focus on the current design activities for Mars Observer, TOPEX, and Mariner Mark II. Of particular note will be the discussion on separator selection and the need for uniform testing procedures to develop a quality battery product that can perform to mission requirements. The recent experiences with the GRO battery failure and the other events have led JPL to the decision to develop a testing program in conjunction with other NASA centers to determine the best separator material for these two missions. Timing, however, is critical. The decision for separator material and battery design must be made a year from now. Thus there will not be time to perform a total 2-year accelerated test. So as in all cases, compromises will be made. The author will discuss JPL's plan for coping with this compromise.

The author will close with a discussion of where NiH₂ batteries are beginning to have an impact and the difficulties from a system point of view with their implementation. Such missions at EOS and the NOAA series of satellites rely upon NiH₂ for success but were not chosen for TOPEX or MO due to their large volume requirements.