

RESEARCH, DEVELOPMENT AND DEMONSTRATION OF A NICKEL-IRON BATTERY FOR ELECTRIC VEHICLE PROPULSION

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The purpose of this contract is to design, develop, and demonstrate full-scale (25 - 30 kW h) nickel/iron batteries suitable for use in electric vehicle propulsion. This contract is also to accelerate the development of nickel/iron batteries for use in electric vehicles, as provided under the Electric Vehicle Act (PL 94-413) of 1976. The program has as its major objectives the following criteria:

battery capacity (kW h)	25 - 30
specific energy (W h/kg)	60
specific power (peak) W/kg	100
(sustained)	20
cycle life	2000
dollars/kW h	60

During 1979 major emphasis was placed on electrode development, both for the positive and negative. The objectives of the program dictate moving the positive electrode technology from 1.2 mm to 2.4 mm in thickness and moving the iron electrode from 3.0 mm to 1.5 mm while maintaining equivalent loading in each. During '79, the transition was made from engineering-scale cells (100 A h) to full-scale (300 A h) cells. The initial full-scale cells have yielded an energy density of 50 W h/kg.

During the reporting period work was also done on battery thermal analysis, basic battery configurations, and electrode/battery manufacturing process studies.

In the first quarter of 1980 the first full-scale (80-cell) battery will be fabricated and tested. Based on these results, final optimization design of the full-scale cell will then be undertaken. Four (4) additional full-scale batteries will then be fabricated and submitted for qualification testing.