Marine Applications for Fuel Cell Technology

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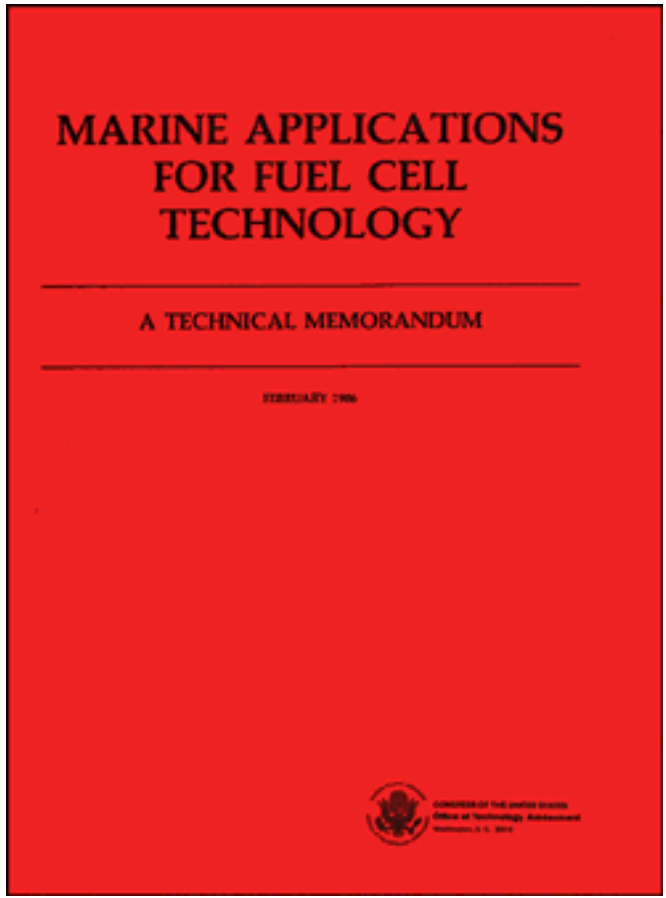

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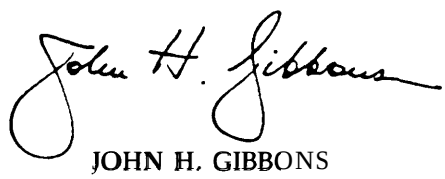
Foreword

Fuel cell technology is one of the most promising of the new electric power technologies currently undergoing development. Fuel cell power systems have attracted attention because of their potential for high efficiency, low emissions, flexible use of fuels, and quietness. The Federal Government and the private sector have been funding fuel cell R&D for more than *20* years. The state-of-the-art has advanced to the point that fuel cell manufacturers hope to begin marketing fuel cells in just a few years. Full-scale demonstration plants are currently being designed.

Much of the available R&D funding has been targeted for phosphoric acid fuel cell research, and this is the type of fuel cell technology most nearly ready for commercialization. However, other types of fuel cells are also undergoing development, and these hold promise for even greater efficiency of power production. The electric and gas utility industries have been most interested in using fuel cell technologies. The electric utility industry hopes to be able to use fuel cells for peak-shaving, load-following, and, eventually, baseload powerplants. The gas industry, on the other hand, would like to employ fuel cells to generate onsite electricity and heat for residential, commercial, and small industrial applications.

To date, almost no attention has been given to the potential marine applications for fuel cell technologies. Nevertheless, some of the benefits that fuel cells may offer to the utility industry may also apply to some marine uses. Recognizing this possibility, the Senate Committee on Commerce, Science, and Transportation asked OTA's Oceans and Environment Program to evaluate the likely benefits and problems of using fuel cells for propulsion and auxiliary power at sea. As part of its investigation, OTA held a 1 day workshop on Sept. 5, 1985, inviting fuel cell manufacturers and participants from the Department of Energy, Maritime Administration, Navy, Army, and industry research organizations. OTA found that fuel cells may offer advantages for some marine uses, including applications requiring quiet operations, applications where throttle settings are constantly changed, and for small submarines. However, the marine market is not in itself large enough to drive fuel cell technology developments. Fuel cells are not expected to penetrate marine markets until they become firmly established in the commercial utility sector.



JOHN H. GIBBONS
Director

Gary Baham
Baham Corp.

Dick L. Bloomquist
David Taylor Naval Ship R&D Center

Frank Critelli
Maritime Administration

Lloyd Fink
Maritime Administration

Sigurd Folstad
International Fuel Cells Corp.

Don Glenn
Energy Research Corp.

Douglas Jewell
U.S. Department of Energy
Morgantown Energy Technology Center

Johann Joebstl
U.S. Army Belvoir R&D Center

Art Kaufman
Engelhard Corp.

William Kumm
Arctic Energies Ltd.

Shirley Morales
Legislative Assistant
Congresswoman Helen Bentley

James E. Nivin
American Commercial Barge Lines

Ted Stanford
U.S. Navy, NAVSEA

Percival Wilson
Consultant

Joe Woener
David Taylor Naval Ship R&D Center

Richard R. Woods
Gas Research Institute

OTA Marine Applications for Fuel Cell Technology Project Staff

John Andelin, *Assistant Director, OTA*
Science, Information, and Natural Resources Division

Robert W. Niblock, *Oceans and Environment Program Manager*

Project Staff

Peter A. Johnson, *Project Director*

William E. Westermeyer, *Policy Ahalyst*

Administrative Staff

Kathleen A. Beil Jacquelynne R. Mulder

Contractor

Denzil Pauli

Other OTA Contributors

Peter D. Blair Thomas E. Bull