



Tech Brief

Evaluation of Hydrogen Fuel Cell Power Source for Cathodic Bridge Protection System

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HERE'S THE PROBLEM

It is unknown whether retrofitting an existing bridge cathodic protection system with an ammonia/hydrogen fuel cell would be feasible for supplying sufficient energy to run the system.

AND, HERE IS THE SOLUTION...

To conduct a preliminary study to test the applicability of a hydrogen fuel cell and design and install a data logger and remote collection unit to monitor the potential long term performance of the fuel cell.

BUT, HOW CAN IT BE DONE?

By selecting a bridge site to install and apply the most reliable fuel cell known and closely monitoring its performance under controlled conditions.

THIS IS THE OBJECTIVE OF THE STUDY...

- To evaluate the feasibility and develop a specification for retrofitting an existing bridge cathodic protection system with an ammonia/hydrogen fuel cell power supply.

AND, HERE'S WHAT WE DID...

To begin, a specific bridge was selected, at which the most reliable fuel cell would be applied under closely controlled conditions. A test site was selected to be Interstate 80 (I-80) in New Jersey and one bridge deck on Route 70, in the Saddle Brook area. These locations have cathodic protection systems, and in some cases, the systems have not

performed well and were to be abandoned.

The New Jersey Department of Transportation suggested the retrofitting of one corrosion protection system on a bridge on I-80 with a fuel cell system and hydrogen fuel supply capacity.

This project involved evaluating the retrofitting process and studying the feasibility of such fuel systems for future implementation on sites with similar defects. A comprehensive search of companies manufacturing fuel cells ensued. General requirements and technical specifications were defined, and a request for proposals was conducted in order to select a hydrogen fuel cell supplier.

Shortly after the request for proposals was conducted, this project was terminated. Insufficient technical information regarding the existing cathodic protection system and subsequent poor response to the request for proposals resulted in the decision to re-write the scope of this project.

CONCLUSIONS...

Given the circumstances of this project, a more detailed and comprehensive study of using a battery with higher power output is necessary. The research team has determined that it may not be feasible to install such a fuel system, due to the lack of the minimum power range needed to be adequately functional.

WHAT IS THE NEXT STEP? A re-written project proposal for a change of the scope of the project to include use of a 19-watt battery system is suggested.

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A final report is available online at <http://www.state.nj.us/transportation/research/research.html>

If you would like a copy of the full report, please FAX the NJDOT, Bureau of Research, Technology Transfer Group at (609) 530-3722 or send an e-mail to Research.Bureau@dot.state.nj.us and ask for:

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