

October 3, 1988

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Dr. Theodore Beck  
Electrochemical Technology  
Corporation  
1601 Dexter Avenue, North  
Seattle, Washington 98109

Dear Dr. Beck:

This will acknowledge, with thanks, the receipt of your comments on the proposal entitled, "The Behavior of Electrochemically Compressed Hydrogen and Deuterium."

Your kind assistance in our evaluation process is genuinely appreciated.

Sincerely,

Ryszard Gajewski, Director  
Division of Advanced Energy Projects  
Office of Basic Energy Sciences, ER-16

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FAX TRANSMITTAL  
REPORT

SEPT 30 7:33 AM '88

DATE:

Ryszard Gajewski

9-30-88

TELEPHONE NO: FAX (301) 353-3870

FROM: T. R. Beck

TELEPHONE NO: (206) 285-7404

SEP-30-88 FRI 16 27 PACKAGES UNLTD

P. 01

To Ryszard Gajewski - Department of Energy

Review of the proposal, "The Behavior of Electrochemically Compressed Hydrogen and Deuterium" by Stanley Pons.

The concept is, to this reviewer's knowledge, new, and it is most intriguing. If the project were successful, it would constitute one of the most important inventions of the 20th century. The investigators should be encouraged to pursue it.

The project appears to be an extreme limiting case of the high-payoff, high-risk type that AEP funds. The payoff approaches infinity and the probability of success unknown and could be small. The product,  $O < (\text{payoff})(\text{success probability}) < \infty$ , is quite indeterminate at this point in time.

On the other hand, this reviewer has serious questions about the reported experiment with  $D_2O$  and the process itself.

1. Agreed that 0.8 eV could theoretically produce  $10^{27}$  atmospheres equivalent for  $D_2$ , but what if the reaction,  $2(D^+ + e^-) \rightarrow D_2$ , nucleates at imperfections like grain boundaries. Since the tensile strength of Pd is only 2000 atm., the material could blow apart mechanically.  $Pd_2D$  supersaturated with D probably has a lower tensile strength.
2. Agreed on the method of the thermal balance but not convinced that there are not valid alternative explanations for the excess heating effect. The investigators case would be stronger if they repeated the experiment in  $H_2O$  and found no excess heating effect.
3. The alledged increase in radiation count in the lab should be elaborated. Where measured? Is it definitive? Is it attributed to tritium from Reaction 1 at the top of page 2? A more quantitative treatment and correlation with excess heating effect would be in order.
4. Is it possible to get a runaway thermonuclear reaction? A 2 cm diameter, 10 cm long Pd rod converted to  $Pd_2D$  could produce an order-of-magnitude 0.1 kiloton explosion by Reaction 1 if detonated. The investigators are proposing to tread in an unknown region. To quote them, "In our view, calculations (such as nuclear force: quantum: molecular dynamic simulations) would be difficult and ambiguous (indeed perhaps impossible at this stage). In these circumstances it is best to resort to experiment." It would be a shame to lose Pons and Fleischmann as well as the University of Utah campus.

Sheldon R. Berk



Department of Energy

Washington, DC 20545  
September 9, 1988

RECEIVED

SEP 25 1988

ETC

Dr. Theodore Beck  
Electrochemical Technology Corp.  
1601 Dexter Avenue North  
Seattle, WA 98109

Dear <sup>Ted</sup> Dr. Beck:

I am enclosing for your review a copy of the proposal entitled, "The Behavior of Electrochemically Compressed Hydrogen and Deuterium," submitted to the Department of Energy's Division of Advanced Energy Projects by the University of Utah.

DOE regulations require that reviewers agree to: (1) return the proposal to us with the reviewer's comments; (2) use the information contained in the proposal for evaluation purposes only; and (3) treat such information in confidence. We shall assume that your proceeding with the review constitutes your agreement to comply with these requirements.

The programmatic objectives of the Division are briefly summarized in the enclosed sheet. You may find this information helpful in performing your review. Should you have any questions regarding the review, please feel free to call me at 301/353-5995.

Your willingness to help in the evaluation of the proposal is genuinely appreciated.

Sincerely,

*Richard*

Ryszard Gajewski, Director  
Division of Advanced Energy Projects  
Office of Basic Energy Sciences, ER-16

Enclosures:  
As stated

Dear Ryszard:

Enclosed is my review and the proposal.

Best regards,

*Ted*

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*Theodore R. Beik*