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Form Letter Accompanying Development of Practical Fusion Power – Plasma Jet Driven Magneto-Inertial Fusion For Scientific Review by “A” Tier Plasma Scientists and Researchers

September 2011-2014

Dear Professor

I am conducting a technical review of the Plasma Jet Magneto-Inertial Fusion (PJMIF) as part of my due diligence in considering private funding for developing commercial fusion power based on the approach. I have learned of your name from reading the fusion literature and from people I have talked to about fusion. I would very much like to have your thoughts and comments on PJMIF and its potential for commercial exploitation of fusion energy. I am not a plasma physicist; I am a corporate executive who, as an undergraduate majored in physics with a math and chemistry minor in the early 1970s. I am scientifically and technically competent and knowledgeable.

For your convenience, I attach two recent publications on the concept. You are probably aware of more.

(a) S. Hsu, et. al. "Spherical Imploding Plasma Liners as a Standoff Driver for Magneto-Inertial Fusion", submitted for publication in *IEEE Trans. Plasma Sci.*, 2011

(b) T. Awe, et. al. "One-dimensional radiation-hydrodynamic scaling studies of imploding spherical plasma liners," *Phys. Plasmas*, vol. 18, p. 072705, 2011."

I understand that PJMIF is a new and innovative fusion concept, and the technology knowledge base for the concept remains to be developed. That does not bother me. I would like your comments and assessments on the following questions:

(i) Are there any obvious fundamental physics flaws with the concept that the proponents of the concept have overlooked? If so, please identify and discuss.

(ii) Are there insurmountable engineering challenges associated with the approach that you can foresee at this stage? If so, please identify and discuss.

(iii) Have the proponents conducted plausible computer simulations and analysis to provide a plausible expectation of the fusion gain achievable by the approach?

(iv) A major challenge for the concept is the ability to produce an imploding liner from the merging of the jets. What is your assessment that the proponents are likely to succeed in achieve

this technical goal, given adequate resources? Do they have credible concepts and approaches for achieving this goal?

(v) Another major challenge for the approach is the ability to get the imploding plasma liner to generate pressures up to 50 mega-bars? What is your assessment that the proponents are likely to succeed in achieving this technical milestone, given adequate resources? Do they have credible concepts and approaches for achieving this goal?

(vi) Yet another crucial challenge to any fusion scheme is its ability to reach the temperature needed for thermonuclear fusion reactions to occur. For a mixture of deuterium and tritium, the canonical temperature for this purpose is 100 million degrees K. Please comment on the ability of the PJMIF scheme to reach such temperatures in principle and/or any issues you see in connection with this goal."

(vii) A typical criticism of any pulsed approaches to fusion from the researchers in the mainstreams of government funded research in steady-state magnetic fusion is that pulsed approaches to fusion cannot produce useful or practical power (Ref: Francis Chen: "An Indispensable Truth: How Fusion Energy Can Save the Planet".) I would appreciate any comments or insight you can share with me on that assertion.

Your help is much appreciated.

Sincerely,

USCL Corporation,



Tomer (Tom) Tamarkin
President