From: Kovar, Dennis [mailto:Dennis.Kovar@science.doe.gov]
Sent: Friday, February 13, 2004 6:33 AM
To: Gray, Matthew
Cc: Orbach, Ray; Staffin, Robin
Subject: RE: modulated quantum neutron fusion info

Dear Mr. Gray,

Following our conversation and your email, I asked four scientific program managers in the Offices of High Energy Physics and Nuclear Physics to look at your website which describes your proposed new energy source by a controlled fusion process "Modulated Quantum Neutron Fusion." It is their assessment that the proposed processes are extremely unlikely for the reasons outlined below.

The first step in the process proposes to collide electrons with protons to form neutrons. Four neutrons in turn would then fuse to form He-4 releasing energy.

Your first step is based on the idea that a neutron is a bound state of a proton and an electron. Forcing an electron and a proton to form a neutron (plus a neutrino, to conserve energy, momentum and angular momentum) is a weak process, and therefore very unlikely. This process cannot happen on earth except in highly rare and idealized circumstances. This process does happen in the final stages of evolution (gravitational collapse) of a dying giant star as it undergoes a "supernova" explosion. It utilizes the crushing force of gravity and the energy released from the gravitational collapse to make the process happen in the bulk of the star. Overall, because of the huge amount of gravitational energy available, a supernova does release a huge amount of energy.

Your second step involves the fusion of the four neutrons to form He-4. Because of the spin-1/2 intrinsic nature of the neutron, combined states of neutrons must obey the "Pauli exclusion principle" which requires that they cannot be at the same place at the same time and in the same quantum state. Thus it is extraordinarily difficult to make this fusion process happen. But, if it did happen, it would result in a He-4 nucleus, two electrons and two anti-neutrinos.

Finally, one must look at the overall energy balance, and one would find that your two processes combined would actually consume more energy than they produce. Consequently, based on available scientific knowledge, we do not see how your proposed fusion process could be successful.

I hope these comments will be useful. Thank you for interest.

Sincerely,

Dennis Kovar
Associate Director of the Office of Science
for Nuclear Physics