

June 7, 2001

Dr. James Decker, Acting Director
Office of Science
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Dr. Decker:

In the enclosed report, a Sub-panel of the Fusion Energy Sciences Advisory Committee (FESAC) recommends that the National Compact Stellarator Experiment (NCSX) be designated as a Proof-of-Principle experiment. The FESAC endorses this recommendation.

The decision to construct a device on the scale of NCSX would represent a major step in US fusion research. As noted in the Sub-panel report, the associated budget plans must respect program balance, including present work and emerging opportunities, within available program resources. Hence, an overview of program priorities becomes appropriate. We have requested more information about those priorities, as viewed by the Office of Fusion Energy Sciences, for discussion at our next meeting. We have also requested a presentation from the stellarator community concerning the compact stellarator research program, including such issues as theoretical and technological support and other stellarator experiments, extending beyond the device itself.

The NCSX program offers an exciting opportunity in fusion research for several reasons. First, a plausible case has been made (for example, at the NCSX Physics Validation Review) that a fusion power system based on a compact stellarator may resolve two significant issues for fusion power systems: reduction or elimination of plasma disruptions, and provision for steady-state operation. These gains earn for the compact stellarator an important place in the portfolio of confinement concepts being pursued by the US Fusion Energy Sciences program. Second, the NCSX would complement research now underway on the advanced tokamak, which addresses closely related issues by different methods. It also complements stellarator research outside the US, which has emphasized different geometries and plasma regimes. Finally, understanding the behavior of magnetized plasmas in three-dimensional configurations is an important scientific frontier area, which the NCSX program would advance and strengthen.

Yours truly,

Richard D. Hazeltine, Chair
Fusion Energy Sciences Advisory Committee

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cc: N.A. Davies
FESAC Members