Sandia National Laboratories
Albuquerque, New Mexico 87185

April 2, 1985

Mr. Robert Minogue, Director
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Minogue:

Enclosed is the December 1984 - January 1985 Bi-Monthly Report of work managed by the Sandia Reactor Safety Research Department. This report covers:

	Fin No.
Accident Energetics	A1016/A1385/A1390
Molten Fuel-Concrete Interactions	A1019
Molten Core-Coolant Interactions	A1030
Core Debris Behavior	A1181
Debris Bed Coolability - EURATOM	A1263
Debris Bed Coolability - PNC	A1264
Core Melt Technology	A1218
High Temperature Fission Product Chemistry	A1227
Hydrogen Behavior Program	A1246
LWR Debris Formation and Relocation	A1335
Hydrogen Mitigative and Preventive Schemes	A1336
LWR Core Debris Coolability	A1340/D1124
Melt Progression Analysis (MELPROG)	A1342
Quantitative Uncertainty Estimation for the Source Term	A1383

Sincerely yours,

Jack V. Walker, Manager
Reactor Safety Research
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Enc: As stated

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and another eight experiments with 6.5 v/o hydrogen in air. These experiments include control burns without water drops.

1.6.1.4 The Effects of Aerosols on Hydrogen Combustion
(L. S. Nelson, 6427; G. D. Valdez, 6427)

We began new experiments to investigate further the effects of a reduced aerosol on a lean hydrogen burn. This was prompted by the single experiment performed last October with a metallic iron aerosol in 6.5 v/o hydrogen in air; in that experiment, we measured an approximately 50 percent higher peak pressure with a faster rise time than the control experiments on those burns with oxidic aerosols present.

In the new experiments, we improved our powder disperser to obtain denser aerosols and switched to a finer iron powder than used in the single experiment in 1984.

We completed three control burns at 6.5 v/o hydrogen in air without the aerosol, and attempted one with aerosol. However, our sequencing apparatus malfunctioned, yielding a burn under unknown conditions.

1.6.1.5 Consequences of Hydrogen Combustion in the Presence of Aerosols
(L. S. Nelson, 6427; G. D. Valdez, 6427)

We performed burns in the VGES chamber with the compositions 16.6, 9.0, and 29.6 v/o hydrogen in air; each burn was performed with 1 kg of 10 w/o CsI-90 w/o Al_2O_3 dispersed throughout the combustion volume. As in the three tests performed in November at 11.0, 16.7, and 6.5 v/o hydrogen in air with the same aerosol disposal, free molecular iodine was generated. Although the chemical analyses are incomplete, initial measurements indicate that as much as 75 percent of the iodide ion present in the CsI was oxidized to molecular iodine during the burn at 29.6 v/o (approximately the stoichiometric composition).

1.6.1.6 Nonpowered Hydrogen Igniters
(L. R. Thorne and J. V. Volpani, 8353)

A platinum igniter has been prepared for evaluation in several static dry hydrogen-air mixtures in a 5 m^3 combustion chamber.

1.6.2 Documentation, Meetings, and Presentations

On December 5, 1984, presentations were made in Albuquerque to C. W. Nilsen and P. Worthington, NRC contract managers