UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 07 1988

Mr. Larry J. Ybarrondo, President
Scientech, Inc.
P.O. Box 1406
Idaho, Falls, ID 84303-1406

Dear Mr. Ybarrondo:

In performing the work on the Research Prioritization project, contract NRC-04-87-089, the effort is to be guided by a set of underlying safety assurance questions and definitions which will be used in the prioritization of RES activities. Safety assurance questions, divided into three categories of safety relevance, have been developed. The categories have been established on the basis of their perceived value to the NRC mission of protecting the public health and safety, the common defense and security, and the environment. In addition, definitions for the attributes of usefulness and appropriateness have been developed.

Enclosed is the set of NRC safety assurance questions and definitions which have been reviewed and concurred in by management in the Office of Research. These questions and definitions should be used as the basis for your continued work under the contract.

Sincerely,

James W. Pittman

James W. Pittman, Project Officer
Research Prioritization Contract
Office of Nuclear Regulatory Research

Enclosure: As stated

cc: H. Hagey
R. Gustave
S. Hudson
J. Halvorsen
PDR

ENCLOSURE

Safety Assurance Definitions

Category A (Vital) questions are those associated with major contributors to risk which could lead to changes having a direct and substantial impact on the health and safety of the public or on national policy regarding generation of power or utilization of by-product or special nuclear material. The answers to these questions could impact directly the licensing of proposed operations, or the regulation of existing operations, including termination or restart of licensed operations.

Category B (Important) questions are those associated with moderate contributors to risk, the answers to which help ensure continued safe operation, and which address potential safety issues. These questions are concerned with inspection and auditing of operations, analysis of operating experience, and evaluation of potential shortcomings of proposed and existing operations. The answers to these questions frequently result in regulatory changes.

Category C (Vigilant) questions are those which must be answered to confirm licensing decisions, improve NRC's capabilities to perform licensing and enforcement functions, offer important insights into the health impact and safety of operations or are exploratory in nature, seeking new knowledge and understanding. Independent assessment of safety concerns and the explorations of safety improvement are also addressed by these questions.

ENCLOSURE

SAFETY ASSURANCE QUESTION

Category A (Vital)

Strategic Plan Section 3
OPERATING REACTORS

Goal: Accident Prevention

A-1 What should the NRC require to ensure that a utility maintains its nuclear power plant in an adequate state of operational readiness, and how (and what) should NRC monitor to ensure that this is accomplished?

A-2 How should NRC determine what unacceptable vulnerabilities to accidents (due to factors such as external events, sabotage, aging, complex transients, multiple failure events, etc.) exist at individual plants and how they can be improved?

Goal: Accident Mitigation

A-3 What short term containment failure modes exist at individual plants and what is an acceptable accident mitigation capability for containments?

A-4 What is the best estimate of the course and consequence of the most likely severe accident scenarios and what should NRC do to improve accident management and emergency planning capabilities?

Goal: Generic Safety Issues

A-5 What information and action are needed for the timely resolution and implementation of requirements associated with Unresolved Safety Issues and high priority generic safety issues?

ENCLOSURE

Strategic Plan Section 4
OPERATIONAL READINESS

A-6 How can NRC determine whether the quality of construction and operations are adequate to assure compliance with regulatory requirements?

Strategic Plan Section 5
FUTURE REACTOR LICENSING

A-7 On what basis should the NRC grant an extension of an operating licensing for an existing nuclear power plant?

A-8 What severe accident prevention and mitigation capabilities should be required of future nuclear power plants?

A-9 What changes need to be made to regulations and what should be the requirements for certification of standard plant designs?

Strategic Plan Section 6
NUCLEAR MATERIALS

A-10 What controls should be used to prevent life threatening exposures to medical or industrial radioactive sources or materials in licensed operations?

A-11 What is the threat of hostile action against nuclear materials and facilities, and what is the best available technology for safeguarding such materials and facilities?

Strategic Plan Section 7
MANAGEMENT AND DISPOSAL OF NUCLEAR WASTE

A-12 What are the relevant issues and proper techniques to characterize and assure performance of the site and engineered barriers for high level waste disposal?

ENCLOSURE

Category B (Important)

Strategic Plan Section 3
OPERATING REACTORS

Goal: Accident Prevention

B-1 What additional knowledge concerning the response of nuclear reactors to complex operating events and accidents does the NRC require?

B-2 What additional knowledge concerning the behavior of materials in nuclear power environments does the NRC require?

B-3 How should NRC evaluate and disseminate operating experience information to contribute toward accident prevention?

B-4 What are the safety concerns and actions NRC should take regarding the aging of components, systems, and structures important to safety?

B-5 How should the safety goal policy be applied to existing reactors?

B-6 How can human factors, reactor controls, and artificial intelligence be improved to better assure safety in normal operations and anticipated operational occurrences?

Goal: Accident Mitigation

B-7 What long term containment failure modes exist and what should be done to address these?

Goal: Generic Safety Issues

B-8 What information and actions are needed for the timely resolution and implementation of requirements associated with medium priority generic safety issues?

Strategic Plan Section 4
OPERATIONAL READINESS

(No applicable questions)

Strategic Plan Section 5
FUTURE REACTOR LICENSING

B-9 What source terms should be considered in design, siting, and emergency planning?

B-10 What are the safety issues and what resolution is required to support the review and certification of standard plants (ALWR's)?

B-11 What information and actions are needed in support of the review of advanced reactors?

Strategic Plan Section 6
NUCLEAR MATERIALS

B-12 How should NRC assure adequate safety of nuclear materials in transportation and storage?

Strategic Plan Section 7
MANAGEMENT AND DISPOSAL OF NUCLEAR WASTE

B-13 How should nuclear power plants and fuel cycle facilities be decommissioned and disposed of?

B-14 What should be the level of radioactive contamination that is Below Regulatory Concern (BRC)?

B-15 What are the relevant issues and proper techniques to ensure adequate siting, licensing, and monitoring of LLW disposal facilities?

Category C (Vigilant)

Strategic Plan Section 3
OPERATING REACTORS

Goal: Accident Prevention

C-1 What confirmatory or exploratory research should the NRC pursue to confirm past licensing decisions, improve analytical tools, better characterize areas of potential concern, etc? (This would include items such as seismic monitoring and code improvement.)

C-2 How can the completeness and precision of probabilistic safety assessments be improved? What reliance can be placed in such assessments?

Goal: Generic Safety Issues

C-3 What improved techniques should be used by the NRC to identify and prioritize potential generic safety issues?

Strategic Plan 4
OPERATIONAL READINESS

(No applicable questions)

Strategic Plan Section 5
FUTURE REACTOR LICENSING

C-4 How should the regulatory structure be improved or developed for future regulation of existing and future plants?

ENCLOSURE

Strategic Plan Section 6
NUCLEAR MATERIALS

C-5 How should appropriate radiation protection standards for worker and the public be derived, measured, and implemented?

C-6 How can implementation of ALARA be improved?

C-7 What is the environmental impact of operating nuclear facilities and how can it be cost effectively mitigated?

Strategic Plan Section 7
MANAGEMENT AND DISPOSAL OF NUCLEAR WASTE

(No applicable questions)

OTHER ASSESSMENT ATTRIBUTES

USEFULNESS

HIGHLY USEFUL: The activity will clearly produce information needed to answer one or more safety assurance questions, and the information will be available consistent with established schedules.

VERY USEFUL: The activity is expected to produce information useful in answering one or more safety assurance questions, and the information is expected to be available on a timely basis.

USEFUL: The activity is expected to produce information bearing on resolving safety assurance questions.

ENCLOSURE

APPROPRIATENESS

HIGHLY APPROPRIATE: There are compelling reasons for the U.S. Government to undertake the activity. Furthermore, among government agencies NRC has the primary responsibility for this activity. Potential compelling reasons are:

(a) the research requires special skills not supported elsewhere,

(b) the research requires special facilities that no one else supports,

(c) the research is classified,

(d) the research provides independent information (e.g. to confirm licensing requirements, establish need and definition of new licensing requirements),

(e) the research is key to obtaining needed information from other countries.

VERY APPROPRIATE: It is appropriate for NRC to undertake the activity. Furthermore, there are no other organizations (industrial or governmental) with clear responsibility for the activity. Without NRC support, the activity would not be pursued.

APPROPRIATE: It is appropriate for NRC to fund the activity, however, either industry or another government agency shares responsibility for or will benefit from the activity, and could participate in funding the program.

RESOURCES

COST-TO-DATE: The cumulative costs spent on the activity prior to FY 88.

COST-TO-COMPLETE: The estimated costs required to bring the activity to completion.

FY 88 COSTS: The budgeted costs for the current fiscal year.

FY 89 COSTS: The estimated budget for the upcoming fiscal year.