

May 15, 2002

MEMORANDUM TO: Edward L. Williamson
Special Counsel for NRC Acquisitions
Office of General Counsel

THRU: Jack Rosenthal, Chief *Original signed by J. Rosenthal*
Safety Margins and Systems Analysis Branch
Division of Systems Analysis and Regulatory Effectiveness
Office of Nuclear Regulatory Research

FROM: Frank Odar
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SUBJECT: FURTHER INFORMATION ON EXAMINATION OF CONFLICT OF
INTEREST

This memorandum responds your questions seeking additional information on conflict of interest issue examined in the memorandum from Farouk Eltawila, RES to Donald Hassell, OGC, dated April 18, 2002. It also summarizes our discussions in our meetings which took place on April 25, 2002 and May 7, 2002 and provides additional background information on PIRT process on TRISO particles.

Pre-PIRT and PIRT Meetings on TRISO Particles

PIRT stands for "Phenomena Identification and Ranking Table." The purpose of holding PIRT meeting(s) is to identify and rank various phenomena and issues involved in a very specific topic. These particular meetings will be held to identify and rank various phenomena and issues related to the performance of TRISO fuel particles. The process of PIRT will be described by the Los Alamos National Laboratory (LANL) in a letter which will be sent to invited participants and reiterated at the meeting. There will be two sets of meetings: Pre-PIRT and PIRT. Similar processes will be followed in both meetings. Participants in the pre-PIRT meeting will be the NRC staff, NRC/DOE contractors and the public. Participants in the PIRT meeting will be international guests and industry representatives.

At the pre-PIRT meeting, the NRC staff will make presentation(s) with handouts identifying important phenomena, issues and raising some questions from the staff's point of view. These phenomena, issues and questions as well as other phenomena and issues that participants

might think important, will be discussed at the meeting(s). After the meeting the participants will prepare written input addressing different phenomena and issues and ranking them. Public will be given opportunity to comment and provide written input. All handouts and written inputs will be included in a NUREG/CR report. If there is a consensus on some issues, these will be consolidated by LANL as part of the report.

TRISO particle is a very small particle. It is about 1.0 mm in diameter. Several thousands of them are dispersed in a matrix of graphite which forms a fuel element. At the kernel of the particle, about 0.5 mm in diameter, there is a uranium compound. This compound is covered with buffered carbon, pyrolytic carbon, silicon carbide and pyrolytic carbon layers. Fission products produced from the burnup are deposited in the buffered layer. Silicon carbide layer contains the fission products inside the particle. This is the first main barrier preventing fission product release. The focus of the meetings is to identify and rank the phenomena, issues and parameters which may be important in breaching this or other barriers which may result in release of fission products to the coolant.

The question of a potential conflict of interest was to be examined because some of the DOE contractors would be paid by NRC funds while the same contractors may be supported to do the same type of research by DOE. You raised three questions:

Question 1: Will the DOE contractor's experts be providing advice and recommendation to the NRC that is in the same or similar matter that they have provided to DOE under their own agreement with DOE?

Question 2: Will the DOE contractor's experts in participating in the PIRT Meetings concerning TRISO fuel as part of their assistance to NRC be required to evaluate their own services or products?

Question 3: In the first paragraph of the RES to OGC memo dated April 18, 2002, RES memo makes the conclusion that "The work is generic; therefore there should not be a conflict of interest." What is perceived "conflict of interest" that RES is referring to in this sentence? And what is the basis for the conclusion that the work is "generic?"

Here are answers to these questions:

Answer to Question 1:

The participant from LANL will ensure that the PIRT process is followed during the meetings and will provide the report on these meetings. LANL does not conduct any similar activity involving TRISO fuel particles for DOE.

Participants from the Sandia National Laboratories (SNL) are involved in severe accident code development. Their involvement in this meeting is required because of their expertise in code development. We need to know after a certain process is identified, whether or not this process can be modeled in our computer codes. SNL does not conduct any similar activity involving TRISO fuel particles for DOE.

Participants from the Oak Ridge National Laboratory (ORNL) are considered experts on TRISO fuel particles. After analyzing the nature of their research for DOE and comparing their potential contributions to NRC through our contracts, we conclude that there is no similarity between the DOE and NRC research since findings from DOE work are not applicable to our licensing activities. Discussion of the matter is as follows:

ORNL is involved with the international Gas Turbine Modular Helium Reactor (GT-MHR) program where DOE participates. GT-MHR is a plutonium burner reactor. The purpose of the program is to replace the existing Tomska plutonium production reactor at Seversk, Russia. DOE has integrated this effort into the existing framework of the Joint Steering Committee. ORNL provides DOE with advice on very wide range of questions beyond safety and licensing issues. They give advice also on programmatic issues.

ORNL is also involved with AAA Fuel Technology and Reactor Based Transmutation programs related to coated particle technology. Research and development in this area are performed to demonstrate feasibility of using coated particles for transmutation applications. In these applications there is no specific focus on uranium. Right now, they are working on minor actinides. The design of fuel is evolving; but, ORNL expects that it will definitely look different from U-fuel.

Hence, ORNL is not working on the same issues as NRC does. TRISO particles in Plutonium burner reactor are different from those to be used in commercial power reactors. Coated particles to be used in transmutation applications are also different from those to be used in commercial reactors. We conclude that there is no similarity between DOE and NRC research work since findings on TRISO particles in plutonium burner reactor or TRISO particles used in transmutation applications cannot be used for licensing of commercial reactors.

Answer to Question 2:

During the PIRT meetings and after the meetings, DOE contractors will never be asked, nor are they required, to evaluate their own products or services in response to PIRT. Evaluation of contractor's performance, their products or service is the responsibility of the NRC staff. As explained in the memorandum from RES to OGC dated April 18, 2002, after conducting PIRT meetings, the NRC staff analyzes and evaluates results of the meetings and make recommendations in a separate NUREG report.

Answer to Question 3:

Based on answers to questions 1 and 2, there is no conflict of interest in participation of DOE contractors in these PIRT meetings. TRISO coated fuel particles have been used in an operating reactor "Ft. St. Vrain" which has been licensed, operated and shutdown. TRISO coated particles have been used in the fuel design of proposed reactors such as GT-MHR, GASSAR and PBMR. It is considered an improved design over BISO particles which were used in earlier reactors. TRISO coated particles are not specific to a specific design. It will

probably be used in all future gas cooled reactors unless a better fuel design is discovered. Because of its applicability to all future gas cooled reactors, our research involving TRISO coated fuel particles is "generic." The knowledge that can be obtained from our research work may benefit the whole country by providing necessary information for licensibility of gas cooled reactors. This research is not considered benefitting a specific company or a nuclear vendor.

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