

ACNW-0130A

MINUTES OF THE MEETING  
ACRS/ACNW JOINT WORKING GROUP  
MAY 11, 1999

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**MINUTES OF THE MEETING OF THE  
ACRS/ACNW JOINT WORKING GROUP  
MAY 11, 1999  
ROCKVILLE, MARYLAND**

The U. S. Nuclear Regulatory Commission (NRC) Joint Working Group of the Advisory Committee on Reactor Safeguards (ACRS) and the Advisory Committee on Nuclear Waste (ACNW) held its first meeting on May 11, 1999, at Two White Flint North, Room T-2 B 3, 11545 Rockville Pike, Rockville, Maryland. The purpose of this meeting was to provide a forum for attendees to discuss and take appropriate action on the items listed in the agenda (Appendix II). The entire meeting was open to the public.

A transcript of the meeting is available in the NRC's Public Document Room at the Gelman Building, 2120 L Street, NW, Washington, DC 205550001. Copies of the transcript are available for purchase from Ann Riley & Associates, Ltd., 1025 Connecticut Avenue, NW, Suite 1014, Washington, DC 20036. Transcripts are also available for downloading from, or reviewing on, the Internet at <http://www.nrc.gov/ACRSACNW>.

ACRS/ACNW Working Group Meeting  
May 11, 1999

### ATTENDEES

Joint Working Group members who attended this meeting were Dr. B. John Garrick, ACNW, Joint Working Group Co-Chairman, Dr. Thomas S. Kress, ACRS, Joint Working Group Co-Chairman, Dr. George Apostolakis, ACRS and Dr. George Hornberger, ACNW. Dr. Charles Fairhurst, ACNW, and Dr. Raymond Wymer, ACNW, also attended. For a list of other attendees, see Appendix III.

#### 1. Opening Remarks

(Richard Major was the Designated Federal Official for this meeting)

Dr. B. John Garrick convened the meeting at 8:31 a.m. on May 11, 1999, and explained that the purpose of the meeting was to discuss the NRC Staff's proposed framework for risk-informed regulation in the Office of Nuclear Material Safety and Safeguards.

#### 2. PRESENTATION BY THE OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS ON A FRAMEWORK FOR RISK-INFORMED REGULATION

Dr. Carl Paperiello, Director of the Office of Nuclear Material Safety and Safeguards (NMSS), provided a status summary of risk-informed regulation in NMSS. He stated that, under the Atomic Energy Act, more than 40 different kinds of non-reactor activities, devices and systems are regulated through approximately 20,000 licensees. Most of the

regulation of nuclear materials is done through the Agreement States Program, in which the NRC relinquishes its regulatory authority to Agreement States who establish programs that are adequate and compatible. Exceptions to Agreement State regulation are the disposal of high level waste, greater than Class C wastes, spent fuel storage, transportation, and fuel-cycle facilities. Dr. Apostolakis asked how the adequacy of state regulatory programs was determined and maintained. Dr. Paperiello replied that state programs were reviewed and evaluated by the NRC every two to four years.

Dr. Paperiello noted that the characteristics of nuclear material applications differed significantly from one another. The complexity varies from simple devices using low activity sealed sources to large fuel cycle facilities or the geologic repository for high level waste. Material applications also differ significantly from reactors. Material applications tend to be less complex, have less sophisticated safety systems, and rely more heavily on human actions to assure safety. Dr. Kress asked if certain materials or activities were exempted from regulation. Dr. Paperiello responded there was a list of things exempted from regulation, such as smoke detectors and luminous dial watches.

There was a brief discussion among Drs. Paperiello, Apostolakis and Garrick on terminology. Dr. Paperiello suggested that there should be a distinction between the terms "risk assessment" and "PRA," with PRA being one technique for doing risk assessment. Dr. Apostolakis argued that the term PRA was more general, and referred to a conceptual

approach that is applied differently in different circumstances, say reactors and high level waste repositories. Drs. Garrick and Apostolakis agreed that clarifying the terminology should be one of the early issues for the Joint Working Group.

Dr. Paperiello stated that the Commission has directed NMSS to develop a framework for the use of risk analysis in decision making. He sees the next step in that process as establishing safety goals for material applications. An essential part of such safety goals is defining the population, or "target," to which they would apply. Dr. Paperiello indicated that he was in the process of establishing a group within NMSS to deal with risk assessment.

Dr. Kress suggested that establishing acceptance limits on regulatory objectives would be the first step in developing safety goals for materials applications. He noted that a common metric should be used for all the different applications, and suggested cost/benefit as a candidate. Dr. Apostolakis held that cost/benefit would be inappropriate in certain circumstances, and that acceptance values might be different for voluntary risks than for involuntary risks. He then asked Dr. Paperiello what was driving the move toward risk-informed regulation in the materials area. Dr. Paperiello replied that it was a combination of circumstances, including the direction toward risk-informed regulation taken on the reactor side, and the need for more quantitative risk information in areas such as high level waste disposal. He went on to question why, logically, different levels of risk

were tolerated for different activities. Dr. Garrick suggested that there should be some logical relationship between reactor safety goals and safety goals for materials applications. Dr. Apostolakis pointed out that numerical values are only one aspect of risk, and that risk is multidimensional. Different numerical values may be chosen because of other considerations, such as controllability or the voluntary/involuntary aspect of risk. Dr. Garrick cautioned that attention should be given to the experience with the reactor safety goals so as to avoid the same mistakes. He pointed out that the reactor safety goals themselves have not been implemented, and that instead core damage frequency has come into use. He further noted that a safety goal is a single attribute concept and may not capture all aspects of risk.

Following Dr. Paperiello's presentation, Mr. Seth Coplan presented the framework for risk-informed regulation in NMSS. He noted that his presentation was based on the Commission paper SECY-99-100, which in turn had its origins in the Commission's strategic planning process in 1996 and 1997. One result of the strategic plan development was a Staff Requirements Memorandum from the Commission that, in part, directed the NMSS staff to review materials regulations to identify areas that could be made amenable to risk-informed or performance-based approaches and to develop a framework for using risk technology in materials regulations. Historically, risk assessment applications have been developed within NMSS to address specific problem areas. Examples include

performance assessment for high level waste repositories and integrated safety assessments for fuel cycle facilities.

Mr. Coplan explained that the activities regulated by NMSS can be divided into four categories:

- Activities that involve long term commitment of a site or facility to the presence of nuclear material at planned, acceptable levels (e.g., high level waste disposal)
- Activities that involve the use of engineered casks to isolate nuclear material (e.g., transportation and storage)
- Activities that involve chemical or physical processing (e.g., fuel fabrication)
- Activities that involve the use of sealed or unsealed byproduct material in a variety of industrial and medical applications.

He identified the risk assessment methods that have been developed or adapted to these four groups as performance assessment (high level waste disposal), probabilistic risk assessment and integrated safety analysis (transportation and storage), integrated safety analysis (nuclear material processing) and hazard/barrier analysis (use of byproduct

material). Dr. Garrick pointed out that a profound difference between materials applications and reactors is that the major risks in materials applications derive from operations, while in reactors the major risks come from accident conditions.

Dr. Garrick questioned whether stakeholders, such as the Agreement States, should have been brought into the process of developing the framework earlier. Mr. Coplan replied that the Agreement States had been offered an opportunity to participate, but they elected to wait until the implementation phase.

Mr. Coplan described the framework for risk-informed regulation of materials applications as being similar to the reactor framework. There are four parts. The first is to identify all areas in NMSS where risk-informed regulation is a possibility. The second is to ensure that considerations underlying current regulations are thoroughly understood, and are only altered after careful consideration. The third is an evaluation of elements that risk considerations could improve. The fourth part is integration of existing deterministic considerations and new risk considerations. The implementation of this framework involves a five step process: (1) identify specific regulatory applications, (2) decide how to modify current regulations, (3) make appropriate changes to regulations and guidance documents, (4) staff training in new regulations and guidance, and (5) develop or adapt needed tools.

Dr. Apostolakis questioned whether the staff was involving other stakeholders, including the Joint Working Group, sufficiently early in the process. Mr. Coplan replied that the model the staff had in mind for its interaction with the Joint Working Group was the same process that was used recently in the development of risk-informed guidance by the reactor regulatory staff and the ACRS.

Dr. Hornberger asked if the staff was confident that risk-informed considerations would not simply become another layer of regulation on top of existing requirements. Mr. Coplan answered that the guidance in the PRA policy statement included the issue of burden reduction, and that goal should be kept in mind throughout the process. Dr. Garrick suggested that it would be helpful to the Joint Working Group to know the staff's opinion as to what are the top 10 risk issues associated with materials handling.

### 3. DISCUSSION OF PROCEDURAL MATTERS AND FUTURE ACTIVITIES

Dr. Garrick asked the working group members for their thoughts on how the working group should proceed. Dr. Kress responded that the risk triplet needed to be addressed for all types of material regulation. He suggested that high level principles should be developed to guide review of proposed regulatory changes, and that such principles needed to include risk acceptance criteria and consideration of uncertainties. He further suggested that the common metric on risk acceptance criteria might be risk/benefit, and that

uncertainties might be dealt with in some way by defense in depth. Dr. Apostolakis suggested that the staff take the lead in developing the high level principles. Dr. Hornberger noted that some thought needed to be given to how the licensees used risk considerations and how the NRC would relate risk assessments to particular regulations. Dr. Garrick observed that materials applications lacked a common risk focal point, such as core damage frequency in reactor applications. He restated his belief that the Joint Working Group needed the benefit of the staff's identification of the significant risk issues.

Dr. Apostolakis recommended that the Joint Working Group write a letter to the Commission recommending that the staff develop a set of high level principles. Other recommendations could be to ensure that the language used in the NMSS effort is consistent with the white paper on risk-informed and performance-based regulation, and to identify aspects of risk, such as controllability, that should influence decisions. Dr. Garrick suggested that the letter could provide Joint Working Group comments on SECY-99-100.

The Joint Working Group next turned to discussion of how the group would conduct its business. Dr. Apostolakis explained that the Policies and Procedures Subcommittee of the ACRS had objected to the idea that the Joint Working Group should itself write letters to the Commission. The preferred approach was for the Joint Working Group to decide if a particular issue should be the responsibility of the ACRS, the ACNW or both. The Joint Working Group would then develop a report for consideration by the ACRS, ACNW or

both, as appropriate. There was general agreement among working group members that situations requiring the NRC staff to brief the Joint Working Group and both full committees should be avoided. Dr. Apostolakis suggested that he and Dr. Kress report to the ACRS on the Joint Working Group's plan to draft a letter and outline the content so the full committee would be aware of what to expect at the July or September meeting.

At Dr. Garrick's suggestion, the discussion returned to the content of the proposed letter. Dr. Hornberger proposed that the first decision was whether to recommend principles or recommend that the staff think about what the principles should be. Dr. Garrick then summarized the points to be included in the letter as (1) a recommendation that the staff develop high level principles, including an example, (2) comments on SECY-99-100, and (3) some discussion of risk assessment methods with an illustration of the continuity of the methods from one category of risk to another. Dr. Apostolakis suggested adding a point on the need for quantitative objectives or safety goals.

Dr. Kress suggested that Dr. Garrick be designated to draft the letter, and Drs. Apostolakis and Hornberger agreed. Dr. Garrick acceded to this suggestion.

The meeting was then adjourned at 11:43 a.m.