

***Proceedings of the Sixth Meeting of the  
Midwestern High-Level Radioactive Waste Committee***

The Great Southern Hotel  
Columbus, Ohio

November 19-20, 1992

---

**Thursday, November 19: Committee Business Session**

Lisa Sattler called the committee business session to order at approximately 1:30 p.m. After general introductions and after reviewing the agenda and the briefing materials, Ms. Sattler introduced Rick Hand, the new participating committee member from Illinois, and Ryc Lyden and Tom Lange, alternates from Minnesota and Missouri, respectively. She also asked members to send alternates in their place if they cannot attend meetings.

**Update of Project Activities**

DOE/CSG Cooperative Agreement. Mike McCabe reported on the status of the cooperative agreement between the U.S. Department of Energy (DOE) and the Midwestern Office of the Council of State Governments (CSG-MW), which is entering its fourth year. Mr. McCabe noted the committee is a major component of the Midwestern High-Level Radioactive Waste Transportation Project in that it facilitates communication between the Midwestern states with regard to the transport of radioactive waste. Mr. McCabe distributed copies of the proposed Scope of Work for FY 1993 and noted that the proposal had not yet been approved. He encouraged committee members to submit ideas for future projects.

Status of Deliverables. Ms. Sattler reviewed the status of deliverables from the previous year's scope of work. The *Handbook of High-Level Radioactive Waste Transportation* was distributed October 30 to over 400 people, including Midwestern governors, legislative leaders, and legislators serving on transportation committees. Ms. Sattler asked committee members to let her know if they wished to distribute the *Handbook* to other people within their states. She said she will distribute copies to new legislators once committee appointments have been made. Elissa Turner remarked that she was pleased with the *Handbook*. David Crose expressed interest in mailing the *Handbook* to all the legislators in Indiana. Bob Owen asked if staff wanted the committee members to distribute the *Handbook* within their states. Mr. McCabe replied that, depending on the FY 1993 budget, CSG-MW may be able to produce additional copies if the committee so desired. He then thanked everyone who submitted comments on the draft of the *Handbook*, and noted the extent to which the committee staff depends on external comments.

The *Midwestern High-Level Radioactive Waste Transportation Primer* is being updated in four parts over the course of a year. Ms. Sattler said she distributed the draft of the first section for comment on November 5, and noted that the deadline for submitting comments was Friday, December 11. The draft of the report on interim storage (a holdover from last year's scope of work) is almost complete. Ms. Sattler said she hoped to have the draft ready for comment by the end of 1992. In addition, she said she has added a number of resources to the reference library and would be mailing out an updated *Index of Available Resources* toward the end of November.

Staff Reports. Ms. Sattler then reported on two meetings she attended since the May committee meeting. She toured the Idaho National Engineering Laboratory (INEL) and observed the TRANSAX '92 exercise while attending a meeting of the Southern States Energy Board (SSEB) TRU Waste Working Group (Pocatello, Idaho). She commented that the TRANSAX exercise was probably very useful for the people participating, however it was not particularly suited to observation. She mentioned that the CSG-MW reference library has a videotape of TRANSAX '90 and offered to loan the tape to anyone who wished to

view it. She also attended a meeting of the Western Interstate Energy Board (WIEB) High-Level Waste Committee in Denver. Ms. Sattler commented that she found the presentations on interim storage, including a tour of the Fort St. Vrain independent spent fuel storage installation, to be very useful in writing the report on interim storage.

### **Roundtable Discussion of Midwestern State Developments**

Ms. Sattler asked committee members to brief the group on recent events taking place in their states.

Ohio: Mr. Owen reported that Perry Nuclear Power Plant was in the process of developing additional storage for LLW generated at the site. The Davis-Besse plant added to its LLW storage capacity several years ago. Both plants have adequate storage capacity for HLW. Mr. Owen mentioned that the operators of the Davis-Besse plant had looked into dry cask storage.

Ohio is the host state for the Midwestern LLW Compact. At the request of the governor and the general assembly, a blue ribbon commission has been established to set criteria for site selection, and to address issues related to facility development and regulation. The commission is to recommend legislation for facility siting to the governor and the general assembly. The target date for this report had been December, however it has been postponed until early 1993. Approximately 15 public hearings are scheduled to take place throughout the state, more than likely starting in December. Larissa Gilham noted with regard to the LLW hearings that the public seems to be questioning why disposal of LLW is being addressed when HLW is a more pressing problem. She commented that the public did seem to be interested in HLW transportation, with people especially concerned over the lack of experience and training on the part of local public safety officials (e.g., volunteer fire departments). Ms. Gilham also noted that a proposal had been made to use the Fernald site as a facility for LLW disposal. Mr. Owen has reviewed the site characterization report. He said his agency had a few concerns, among them the fact that the southern part of the site overlies an aquifer. A suggestion has been made to relocate the proposed facility to the northern end of the site.

Kansas: Frank Moussa reported that the Wolf Creek Nuclear Power Plant is licensed until 2015, has adequate storage capacity for HLW, and has LLW storage capability until 2005. He said Kansas is still trying to update its transportation corridor data (the state has been using data from a study conducted in 1975). Mr. Moussa noted that his office hopes to use money from the state's HMTUSA planning grant to update the corridor data.

Illinois: Mr. Hand reported that spent fuel storage pools in Illinois are projected to run out of space in 2009. He said the Morris facility has some space reserved for strategic purposes. He also noted that two shipments of spent fuel had passed through Illinois without any incidents. One shipment came from a college in Missouri, and one left the Dresden nuclear plant headed for experimental usage in Chalk River, Canada. Mr. Hand said most activity with regard to HLW is on hold until there is a clear indication of what will happen with the Yucca Mountain site. Mr. Hand remarked that over 400 shipments of HLW had passed through Illinois over the years, with few special occurrences. He said one of the biggest problems had involved state troopers stopping trucks with mechanical deficiencies.

Indiana: Mr. Crose commented that no nuclear facilities are located in Indiana, but the state is a pathway for shipments coming from or going to Illinois or Michigan. A task force had been established for designating routes for all classes of hazardous materials. Mr. Crose said the state was going to seek approval to use HMTUSA planning and training money for the task force.

Iowa: Don Flater reported that Iowa generally has HLW shipments coming from Nebraska and Illinois, however there had not been any for quite a while. He said past shipments had been without any surprises, except for one incident in which a man jumped a train for a ride and was immediately apprehended by armed guards. He commented on the lack of interest in the shipments, which concerns him because interstate 80 is and will be an important route.

Mr. Flater described a recent exercise regarding the public health and safety implications of a possible failure of the Wahee Dam (north of Pierre, SD, on the Missouri River). The scenario involved the dam breaking due to erosion, including the failure of an upriver earthen dam. According to the scenario, water would cover the road heading to Fort Calhoun Nuclear Power Station, and presumably would flood any dry storage facility constructed at the site. Mr. Flater said this exercise indicates the importance of looking at the vulnerability of HLW and LLW storage facilities developed at nuclear power facilities alongside rivers. Ms. Turner asked if a plant's emergency response plan would cover this contingency. Mr. Flater said that the utility had not been prepared for the possibility of flooding due to the Wahee dam breaking. Mr. Flater also noted that his state has only one nuclear plant, however responders must be prepared for incidents associated with two plants in Nebraska and Illinois.

Nebraska: Harold Borchert began by commenting that he had not been aware of the Wahee dam scenario and its impact on Fort Calhoun. He said his office had been asked by the governor to look at the possibility of licensing a long-term (30 years) interim storage facility for LLW. In the process, he has tried to determine whether the U.S. NRC or the state of Nebraska has the regulatory responsibility over material at the point of generation (inside the nuclear plant). He has received two different responses from different people at NRC. It seems clear that the federal government has authority for the exclusion area around the facility, and that the state can license offsite storage facilities; however, there is some question as to who has authority over the owner-controlled area.

Mr. Borchert said small generators will be hurt by higher LLW disposal fees more than utilities. He noted that currently utilities are not allowed to receive waste generated by another party. Mr. Moussa said he was aware that some activists from the state of Kansas had traveled to Nebraska to promote the option of having utilities accept LLW from other generators. Mr. Borchert said he had heard the same thing. Mr. Flater said licensing and brokerage would become issues if utilities accept waste from off-site. He noted that some groups were hoping to transfer waste from the point of generation to a reprocessing center, and then return the waste to the point of origin. Mr. Flater noted this cannot be done without the shipper being licensed to receive the processed waste.

Mr. Borchert said 30 rail shipments of spent fuel had come from the Cooper Station. One car on a train coming into the facility jumped the track. The cask was not dislodged from the railcar, however his office was notified within 10 minutes of the occurrence. The incident did not show up in the news media. Only one question was asked regarding the potential for public exposure if the train travelled through Lincoln on its way to Iowa.

Mr. Borchert noted that the state patrol is the lead agency to receive notification of HLW shipments. There was a movement several years ago to require notification of other agencies within the state, but the legislature rejected the idea. Ms. Turner asked if the initiative had involved only high-level waste, and Mr. Borchert replied that it encompassed all shipments. Ms. Turner commented that such notification did not seem to follow NRC's regulations regarding prenotification. Mr. Borchert said a provision allows the governor to notify other agencies on a need-to-know basis. Mr. Flater added that the Disaster Services Agency in Iowa receives notification of shipments and then notifies his office. Under NRC regulations, he cannot release the information for ten days, however having the information gives his office time to prepare for any incident that might occur. Mr. Crose added that the Indiana State Police receives notification of shipments and automatically notifies his office.

Mr. McCabe asked Mr. Borchert and Mr. Flater to what they attribute the lack of media attention regarding shipments of HLW. Mr. Borchert said it was most likely because past shipments had been without incident. He commented that training first responders on HLW routes was difficult because of a high degree of apathy. The attitude seemed to be that the nuclear plants had been operating for 15-20 years without any incidents. Mr. Flater commented that the time of the year matters a great deal, since farmers cannot take time out of their work during the fall harvest. Mr. Borchert agreed and said this may be a problem because most of the responders are volunteers, and if an incident occurs in the fall, many will not answer the call. He also said he has heard people in the potential corridor for transporting LLW say that if there is an accident involving radioactive material, they will not respond at all. Mr. Crose said this was also the general attitude among local responders in Indiana -- namely that the state should

handle such incidents instead of expecting local people to respond. Mr. Borchert said this attitude may create bigger problems as 1998 approaches.

[At this point, the group broke into a discussion of risk communication and public perception of risk.]

Mr. Borchert stressed the importance of risk communication and the ability to articulate concepts of risk to potential responders. He mentioned Peter Sandman at Rutgers University, who portrays risk as a combination of hazard and outrage. Ms. Turner asked Mr. Borchert if he thought the public would have confidence in the ability of state agencies to respond if they were aware of how well organized the agencies are. Mr. Borchert agreed this would be a step in the right direction. He commented, though, that while he was working in the state of Kansas, a truck had spilled yellowcake all over the highway. The first responders arrived less than 15 minutes after the incident, yet they were chastised by the news media and the public for not responding more quickly. Mr. Flater commented that if it were possible to convince the news media not to glorify incidents involving radioactive waste, there would be less concern. Ms. Turner thought there must be some way to develop realistic expectations in the public. Dwain Baer agreed, and said the media should learn to exercise responsible journalism.

Mr. Flater commented that he sees the situation as involving two groups: 1) children, who must be educated so they understand what radiation is and the hazards involved, and 2) older people, who are afraid of radioactivity and will in all likelihood never change that opinion. It concerns him that no effort is being made at the federal or state level to educate children about radiation. Ms. Turner said DOE is working on educational programs, ranging from addressing the general public to working to guarantee a pool of skilled scientists and engineers will be available in the future. Mr. Flater asked if DOE was working in conjunction with the Department of Education. Ms. Turner said she was not sure, but that she knew DOE was working directly with schools to develop curricula. She described a meeting in which participants looked at materials developed by a teacher. Aimed at younger children, these materials included a board game focusing on how to transport nuclear waste. Ms. Turner offered to speak with some of the people working on education and arrange to have them speak to the committee if there was interest in the issue.

Mr. Flater described a video tape, produced by the National Children's Theater, that was presented two years ago at a national radon meeting. His office purchased the tape, which comes with a script and can be taken to the schools for role-playing exercises with children. He noted that the tape was essentially a tool to get teachers started. Ms. Turner said her understanding is that teachers are generally willing to use prefabricated lesson plans, so the goal is to create quality materials and get them into the hands of the right people. Mr. Flater said he had heard North Carolina had a campaign to educate teachers regarding radioactivity. Ms. Turner noted that it is also important to remember that children have access to their parents and can therefore influence adults. Mr. Flater asked Ms. Sattler to call him for information on the video tape, and Mr. Lyden asked Ms. Sattler to pass this information on to the people at the meeting once she obtains it.

Ms. Gilham mentioned that some people in Columbus who worked in the field of nuclear engineering had volunteered to help teachers develop programs such as the ones being discussed. Mr. Owen said the state board of education asked the general assembly to compile a report on how to improve math and science education in secondary schools. The report has been filed, and Mr. Owen will work with the board to identify what should be included in educational materials. He said it is common for science textbooks to include a chapter on nuclear processes at the end, which means the students seldom cover it because they always run out of time. Ms. Turner said she also has heard of a program in which students in high schools were assigned the task of developing emergency response plans. Ms. Sattler asked where the program had taken place. Ms. Turner and Jozette Booth offered to follow up on this issue and pass the information on to Ms. Sattler.

Ms. Gilham said the museum of science and industry in Columbus has a hands-on program with science projects for children of all ages. The Ohio Radioactive Material Users Group has been invited to participate in a project on nuclear energy and radiation with the museum. So far the project is in the tentative planning stages.

Mr. Hand asked what vehicle people were using to get into the schools. In Illinois, the only thing the Illinois Department of Nuclear Safety (IDNS) has been able to work on are sciences fairs and similar devices. Mr. Hand said his office has had no luck in getting teachers to use the materials it develops. He said the IDNS has gone to the state board of education and the PTA, but they have been told there is already too much material to cover in the schools. Mr. Borchert said his office has been able to get into a number of schools with the radon issue, mainly because Nebraska has the third largest radon problem in the country. They have been asked to develop an education program for this January. Kearny State University has a research program that brings science teachers together to discuss radiation issues and health physics for two days, including a tour of a nuclear plant. Ms. Gilham commented that people often are reluctant to tour nuclear power plants because they fear it might be dangerous.

Mr. Baer said people have a very negative impression of the incident at Three Mile Island, yet Unit 1 is one of the best running units in the U.S. and Pennsylvania in general has a very good record with regard to nuclear power. Mr. Lyden brought up the fact that people often receive mixed signals. As an example, he cited an incident in which nuclear weapons fell off a B-52 over Spain. People were told there was no safety problem, yet all the while officials on the scene wore Tyvek suits. He commented that being so safety conscious can actually make the situation look worse than it is. As an example, Mr. Moussa said in his state, the health physics people have been asked to wear booties, gloves, and self-contained breathing equipment. He speculated that the public must wonder why responders wear this gear if the situation is not hazardous.

Mr. Lyden said he had run across three cardboard boxes that had been used in a training exercise years earlier. Someone had copied labels saying "radioactive" and pasted them on the side. The boxes were left sitting on a shelf, where they were discovered by a cleaning lady. Mr. Lyden said soon afterwards people in the building began complaining of headaches and finding dead bugs. Some lawsuits were filed, and the NRC began looking into the matter. Ms. Turner said people like to be frightened because it adds excitement to their lives. Mr. Lyden said his office is now looking into ways to identify props as strictly mock ups to avoid a similar incident.

Minnesota: Mr. Lyden said before becoming the state radiological officer, he worked for six years at the county level with a 36-member response team (one of three in the state). As part of his job, he turned an 8-page training document into a 175-page manual. Mr. Lyden reported that an air craft had come in through Duluth with part of the skin missing from the wing. Since a technetium-99 source was on the craft, the local civil defense director was called in. He declared the situation to be safe. Mr. Lyden had to monitor the technetium source, which was inside a cabin measuring 5-6 cubic feet. The officials on the scene would not let Mr. Lyden inside the plane because the cargo included millions of dollars in cash. He expressed some concern over the capability of the team that responded to the incident.

Mr. Lyden said he created a database to store information on hundreds of different isotopes so that duty officers can get information on a specific isotope in case of an incident. The officer simply has to type in the name to call up a screen showing whether the material is an alpha, beta, or gamma emitter (including an explanation of what alpha, beta, and gamma mean), what monitoring instruments to use, what health effects to anticipate, etc. He mentioned that he had a laptop computer with the database on it, and offered to show the program to anyone who was interested. Mr. Moussa said Louisiana State University had similar software available for the FEMA course. The LSU software is not copyrighted and can therefore be copied.

Minnesota is looking into forming regional hazardous materials response teams. The Minnesota Department of Health used to have field teams that conducted emergency response exercises at the state level for power plants. Department officials decided it was too risky to continue these exercises, so the Emergency Management agency hired two different fire departments to work with them. Mr. Lyden said this situation is working out better than when they worked with the health department because fire fighters are more response oriented.

The Northern States Power Company (NSP) has asked for permission to have 48 dry cask containers stored at the Prairie Island nuclear plant. NSP asked the Minnesota Public Utilities Commission for a

permit for temporary storage. The commission's judge said he could not consider storage to be temporary because there was no place to send the waste to for permanent disposal. As a result, the issue would have to go to the Minnesota Legislature. The Minnesota Public Utilities Commission eventually approved 17 casks, which, if used, would give the plant storage until 2000. To date, construction has been limited to laying a concrete slab out at the site. NSP estimates January 1994 as the tentative date of operation of the storage facility.

The Prairie Island Sioux tribe is fighting construction of the storage facility, which will not be on Sioux property. The one road leading to the power plant is on Sioux land, and the tribe has threatened to block the route when the utility begins bringing in casks. Mr. Lyden offered to distribute copies of an article from a Minnesota newspaper and a statement by John Kerr regarding the Prairie Island dry storage facility. Mr. Lyden also noted that the Prairie Island Indian Community applied for an MRS grant. The leadership of the community has stated that in the "highly unlikely eventuality that an MRS facility is constructed" on their site, they would sell the property and move.

NSP is currently looking at relicensing the Monticello plant, but is holding off to see what will happen with the federal waste management program. Mr. Borchert asked about the dose limitation controversy with regard to cask storage at Prairie Island. Mr. Lyden said he had heard something, but he did not know the whole story. He suggested Mr. Kerr would have more information. Ms. Sattler asked Mr. Borchert for some clarification, and he replied that the state of Minnesota was trying to impose an extremely low dose level on the cask storage facility at Prairie Island. He was not sure who was behind the initiative or what the rationale was, but the national health physics society was concerned about states trying to prevent construction of storage facilities by imposing dose levels that would be impossible to meet. Mr. Lyden indicated that the Prairie Island Sioux may be responsible for initiating the efforts to limit dose rates.

Missouri: Mr. Lange has been working closely with LLW generators to ensure capability for on-site storage in anticipation of the loss of access to the existing sites. Access will remain available until June of 1994, however the price will rise considerably.

Shipments of HLW have taken place through and from Missouri. Some shipments headed east from research reactors at the University of Missouri-Columbia. The Callaway Nuclear Plant (the only nuclear facility in Missouri) shipped some spent fuel to Chalk River, Canada. Mr. Lange also thought some waste from the Cooper Station in Nebraska had passed through Missouri by truck. Mr. Borchert commented that he was not aware of any shipments from Cooper.

In other developments, Missouri recently elected a new governor -- Mel Carnahan, the first democrat in 12 years. He will take office January 11. Mr. Lange noted that there had been almost a clean sweep of high offices in Missouri, with the Democrats taking most of them.

Ms. Sattler opened the floor to anyone who wished to comment on events in their states.

Ms. Gilham said Commonwealth Edison Company (IL) has indicated it may store its LLW for two years without losing capacity rather than pay higher fees charged for disposal at the Barnwell site in South Carolina. Commonwealth Edison operates 12 reactors in the Midwest, thus keeping its LLW from Barnwell may reduce the facility's revenues, which may in turn lead the South Carolina Legislature to vote to close the facility. Mr. Hand said he was aware Commonwealth Edison had started a huge shipping campaign to move as much of its LLW as possible to Barnwell before the fees increase. Mr. Flater speculated as to what the utility would do when it eventually had to dispose of its LLW. Mr. Hand said he thinks the assumption is that by the time disposal becomes necessary, Illinois will have selected a site for its LLW disposal facility.

Ms. Gilham said the Perry plant (OH) encountered a problem with commissioners when the utility applied for a permit for a LLW facility. Ohio belongs to the Building Officials Congress of America (BOCA), and recently revised its building code to conform with BOCA's standards. As of September 1, "radioactive material" is now defined in the building code as any material which by itself or with another

material emits spontaneous ionizing radiation. All materials fitting the new definition must be stored in a high-hazard building. Mr. Gilham said the code grandfathers in existing structures, however any new buildings or additions to existing ones must comply with the new code. Mr. Owen is currently looking into the ramifications of the new code. Ms. Gilham wondered what other states are doing, since some of them are presumably in the same relationship with BOCA or a similar group.

Mr. Borchert asked about the rationale behind the code, given the fact that smoke detectors contain radioactive materials and are in many buildings. Mr. Baer said Ohio environmentalists have distinguished between good and bad radiation, with good radiation including smoke detectors and materials coming from hospitals, colleges, and some industry, while nuclear power plants produce the bad radiation.

### **New Committee Business**

Appointment of Committee Chairman: Ms. Sattler reminded the committee that they had discussed electing a chairman at the last meeting and agreed it would be a good idea for several reasons. First, having a chairman would formalize the comment process. Second, the committee has an opportunity to send more people to occasional DOE meetings -- the chairman would either be that extra person or would appoint someone to represent the committee. Third, a chairman would be able to give the group direction in setting the agenda for meetings and suggesting projects for future scopes of work. Ms. Sattler noted that since the last meeting, Mr. Borchert had expressed his willingness to serve as chairman. She asked if anyone else was interested in the office and, there being no response, she called a voice vote to elect Mr. Borchert as chairman. The vote was unanimous in favor of the motion.

Adoption of Resolutions Process: Ms. Sattler said she and Mr. McCabe had received inquiries as to the formal procedure for submitting comments through the committee to DOE and other groups. She said there is no set procedure. Mr. McCabe said the committee had commented on a few measures in the past, but the comments on the Draft Mission Plan Amendment (November 1991) marked the only time the committee had prepared the comments. Ms. Sattler asked if there was interest in establishing a formal procedure. She said staff could continue to monitor the *Federal Register* and other opportunities for comment and then draft comments for committee approval. Mr. Moussa asked if the committee had by-laws and if a formal comment procedure would be included in them. Mr. McCabe said the committee had discussed the matter of by-laws at the first meeting and had rejected the idea. He mentioned that the committee could always revisit the issue if it wished.

Mr. McCabe then reviewed the committee's past with regard to commenting: The committee staff have submitted comments on behalf of the committee in the form of letters signed by staff. Now the staff can add weight to these comments by having the committee chairman sign them. Mr. McCabe noted that the committee can also direct formal policy statements to DOE and other groups. He also mentioned that the committee may be able to add legislative or gubernatorial voices to statements of policy through the Council of State Governments.

Ms. Sattler suggested having the staff continue to be responsible for drafting comments. Future committee meetings will include time to discuss proposed comments and/or policies. If necessary, the committee can also operate through the mail or through conference calls. She asked the committee members to feel free to contact the staff if they have suggestions for comments. Ms. Gilham asked if the committee had commented on anything announced in the *Federal Register*, and Ms. Sattler replied that she had been watching for opportunities to comment but had not yet found anything pressing. Mr. McCabe mentioned that individual committee members have submitted comments on behalf of their states and that they might want to consider presenting those comments for consideration by the committee.

Mr. Borchert agreed that it would be a good idea to discuss comments at committee meetings, but stressed the need to conduct business through the mail or conference calls if time is limited. Ms. Sattler mentioned that at the committee business session on Friday, there would be an opportunity to discuss everything the group would hear on cask development and testing, and at that time the committee would be able to discuss whether or not to draft a policy statement on the issue.

Having decided to continue with the same process for commenting as used in the past, Ms. Sattler submitted a proposal for the committee to review. The proposal addressed a suggestion made at the May meeting of the Transportation Coordination Group (TCG) to hold a Director's Forum on transportation and to do so in conjunction with a future TCG meeting. Ms. Sattler explained that to date only one Director's Forum had been held (in Chicago), the subject being early site suitability of Yucca Mountain. She noted that the purpose of the Director's Forum was to provide interested parties an opportunity to voice their concerns to the Director of OCRWM.

Ms. Turner provided the group with some background information on the TCG. She said the extensive planning that goes into the meetings of the group limits their frequency to one every 9 months or so. She added that the group brings together people who work in the field of radioactive waste transportation to inform them of the issues and get their input in the development of DOE policy. She said the TCG dates back to 1986-87 and was one of the first outreach efforts developed by OCRWM. The group works on both institutional and technical issues.

Ms. Turner said the agenda for the next meeting is still being developed. She acknowledged there had been criticism concerning attendance at the last meeting -- namely, that DOE staff and contractors far outnumbered state and local representatives. She said DOE is trying to find a way to fund more participants. Ms. Turner said she suggested bringing all the cooperative agreement groups to the meeting, but DOE's budget is too limited for such an effort. Mr. McCabe said he has been representing the committee at TCG meetings and he is not satisfied with this level of participation. He said he has arranged for the committee to send additional people to these meetings as the travel budget allows.

Returning to the Director's Forum, Ms. Sattler noted the national scope of transportation as compared to disposal, and said one way to reach the greatest number of people would be to combine a Director's Forum on transportation with the individual meetings of the various regional groups that address transportation issues. She asked Ms. Turner if the attendance at previous TCG meetings had been as skewed as it was at the last meeting, and Ms. Turner replied it was her impression that the attendance at the 1990 meeting more closely reflected the interested parties. She also noted that the Western region is often heavily represented because its representatives have more money. Ms. Turner commented, though, that OCRWM feels it is very important to have the input of Midwestern, Southern, and Eastern states on transportation issues, since they will be corridor states. Ms. Sattler agreed, and said a good start would be to adopt the strategy of holding several Director's Forums on transportation in conjunction with regional meetings. Ms. Sattler asked the committee to approve the proposal and submit it for inclusion in the final TCG minutes. Ms. Turner suggested also sending it to the Director of OCRWM. She said she would look into this option in light of the possibility of the Clinton Administration appointing a new director.

Mr. Hand expressed support for the proposal. Mr. Lange asked who heads the TCG. Ms. Turner said the group is very loosely organized, and that DOE is in charge of the agenda and sponsors the meetings, but she implied that no one really heads the group. Mr. Lange then asked how many times the TCG had met. Ms. Turner said about 12 times. Mr. McCabe mentioned that Mr. Halstead, who would be speaking at Friday's session, had been participating in TCG from the beginning and would be the person to speak to for information about the group.

In response to Mr. Lange's question about the first Director's Forum, Ms. Turner said to her knowledge the meeting was not very well attended, but that may have been because the issue was fairly technical. Ms. Sattler noted that attendance was probably much lower than it would have been if the meeting had been located in Nevada, given the fact that the topic was the siting of the repository. Ms. Turner said this issue had been raised. Mr. Lange asked what the format of the meeting had been. Ms. Turner said about 35 people sat around a horseshoe-shaped table with the director at one end, and they all discussed the study on early site suitability. Mr. Lange asked if attendance was by invitation only and, if so, who had been invited. Ms. Turner replied that she did not know who had been invited, but that she would get that information for the committee. Someone asked if a representative from Illinois had attended the meeting, and Ms. Turner said she would find out.

Mr. Crose said he thought the committee should become more involved in transportation because of the impact it will have on the Midwestern states. He expressed concern that only 24 out of 95 people attending the last TCG meeting were from state or local government. Mr. McCabe said he did not want to sound critical of the people DOE sent to the meeting, because the skewed representation really does seem to be a matter of funding. He also noted that a few people at the meeting represented several states, so theoretically the representation was much more broad. He said that the staff's discomfort with the representation is that committee principals are in a more appropriate position to present their state's views.

Mr. Borchert commented that the committee would have to receive meeting agendas for DOE meetings well in advance so it can discuss the issues to be addressed. Ms. Turner said briefing packets are sent out 2-4 weeks in advance. She asked Ms. Sattler to provide her with a list of committee members to add to the TCG mailing list. She also said one option for funding more people may be to hold the meeting in Washington, DC -- the obvious advantage being a savings on travel expenses for DOE staff and contractors. She said having a meeting in Washington also may increase state attendance since people may be able to get "double duty" out of the trip. Mr. Borchert reiterated his concern over sufficient lead time, and Ms. Turner said they generally send out the agenda 6 weeks before the meeting. She mentioned that they are currently trying to figure out when to have the next TCG, with March or April likely candidates. She suggested OCRWM could send out an early notice so people can mark their calendars.

Ms. Sattler asked if there was support for the proposal and, receiving the committee's support, she said she would draft a letter for Mr. Borchert to sign.

Future Projects and Next Meeting: Ms. Sattler noted that the committee had traditionally met in May and November. She asked for suggestions for a future site, and noted that the committee was probably not restricted to holding its meetings within the region if, for instance, they wished to visit a particular site. Ms. Turner concurred. Mr. Flater said a May meeting would have to be held during the first week because the CRCPD has its annual meeting in the latter half of May.

Mr. Crose offered Indianapolis as a meeting site, especially since May is race month. Ms. Sattler mentioned the possibility of going to Virginia to tour the Surry site, since the plant has an on-site dry cask storage facility. Mr. Hand commented that he has access to the Morris facility, and Mr. Borchert said the committee had visited that facility a few meetings back. Ms. Sattler suggested Argonne National Laboratories as a possibility as well.

Ms. Sattler then asked for recommendations for meeting topics. She said risk perception and communication seemed to be an issue of great interest among committee members. Ms. Gilham said her office had run a workshop in September with the help of the Technical Assistance to States program at INEL. She said they had heard some excellent speakers, including Caroline Stowe from North Carolina and Karen Chess from Rutgers.

Mr. Hand asked if the committee addressed the changes in Title 49 HM-181 regulations regarding transportation. Mr. McCabe said the committee had a DOT speaker discuss this at a previous meeting, and that if there were sufficient interest the issue could be addressed again.

Mr. Flater said on January 1, 1994, the NRC's new dose limits will take effect, with large reductions, e.g., to 100 mrem from 500 mrem. He asked how the new doses would affect transportation, since all the agreement states are required to drop their dose rates at the same time. Ms. Turner said she thought this would be something NRC would discuss with agreement states, but that this group could look at the issue as well. Mr. Flater said he has not heard this question raised yet at agreement states meetings.

Ms. Sattler said the staff would work on dates, topics, and locations for the next meeting. Mr. Borchert said a good site would be the WIPP site. Ms. Turner said there are tours of the facility, but getting there might be a problem, since it is far from any major cities. Ms. Turner said she had taken a tour of Yucca Mountain and that there currently is not much to see.

Ms. Sattler asked if anyone had gone to the International High-Level Waste Management Conference in Las Vegas. Ms. Turner said it would be a good idea to go there for a meeting, but it may strain DOE's budget if too many regional groups decided to go at the same time. She mentioned there is a fee to participate in the conference, which runs 3 to 4 days. She said she would check the contracts to make sure the committee can go outside the region. Mr. McCabe noted that there appeared to be precedence for doing so.

Ms. Sattler adjourned the meeting for the day at 4:00.

### **Friday, November 20: Shipping Cask Development**

Mr. Borchert called the meeting to order at 8:30 a.m. After general introductions, he introduced the first speaker, Ms. Turner from OCRWM.

### **OCRWM Transportation Program Update**

Ms. Turner briefly discussed the four different components of the Civilian Radioactive Waste Management Program:

- 1) Cask system development: To be discussed by Mr. Bill Lake later in the day.
- 2) Support systems and operations planning: Utilities submit delivery commitment schedules (DCSs) identifying the amount and locations of the spent fuel the utility hopes to ship in a given year. To date, based on DCSs, DOE has determined preliminary 1998 shipping sites to include 13 different sites in 8 states: California, Idaho, Wisconsin, Illinois, New York, New Jersey, Connecticut, and Massachusetts. The utility proposes the shipping mode, and DOE must approve or disapprove within 90 days of receipt. A final delivery schedule is submitted 12 months before delivery and must specify the exact shipping mode to be used.
- 3) Economic and systems studies: This component includes the Facility Interface Capability Assessment (FICA), which assessed utility cask handling capabilities, and the Near-Site Transportation Infrastructure study (NSTI), a study of potential road, rail and barge access to 75 reactor sites and 1 storage site (Morris, IL).
- 4) Institutional: Ms. Turner reviewed §180(c) of NWPA for the group. She quoted from the act, then explained that OCRWM has been trying to determine the exact meaning of this directive. In January 1992, OCRWM published a Draft Strategy of how it will develop and implement §180(c) policy. Only four groups commented on the Draft Strategy (WIEB, Inyo County, CA, New Mexico, and EED). The final version is essentially the same document that went out in draft. It includes a definition of affected Indian Tribe and an appendix listing the comments received and OCRWM's response. In addition, since releasing the Draft Strategy, OCRWM has made a policy decision that state and tribal jurisdictions through which OCRWM ships waste will be eligible for §180(c) assistance whether or not they are hosting a disposal or storage site. This issue was raised by the state of Nevada, which expressed concern that, because it is a host state and has a number of benefits already coming from DOE, it might not be eligible for funding under §180(c).

Ms. Turner said OCRWM is currently working on an options paper for developing §180(c) and encouraged the committee to submit comments on the draft outline for the paper. The outline presents five groups of options for distributing funds. Ms. Turner said OCRWM had hoped to have a draft paper to take to the TEC meeting in San Francisco, however it appeared they would only be presenting the draft outline for discussion. Mr. McCabe asked Ms. Turner to briefly explain the role of the TEC group. She explained that two programs (EM and OCRWM) had come together to form a state, tribal, and local transportation external coordination group to look at all the issues that affect transportation, including emergency response. The working group was designed to be an emergency response group, but DOE added safe, routine transportation because of the §180(c) requirements. Originally, OCRWM had wanted

to convene a §180(c) working group, but they discovered that most of the people that would be invited to participate in that group would also be working with the EM group, so DOE combined the two. The TEC group has met once in New Orleans, and is scheduled to meet in San Francisco in December. Ms. Turner said she would discuss the first meeting in more detail later in her presentation.

Ms. Turner then reviewed the major §180(c) funding options, including the benefits and potential issues associated with each. Piggy-backing onto established federal agency mechanisms (e.g. FEMA or DOT) is one option; however, there is no single comprehensive mechanism available and massive inconsistencies exist between the programs, especially with regard to Indian Tribes. Another option would be to distribute funds through cooperative agreements with state, tribal, and private organizations (e.g. the Council of State Governments). This approach would allow OCRWM to expand on already existing relationships and would provide room for flexibility to cover both safe routine transportation and emergency response. Unfortunately, there is some question as to the legality of this method, particularly whether or not OCRWM is authorized to pass funds to non-state or tribal governments.

A third option would be to develop a coordinated grant program within DOE, independent of other federal programs. Potential problems with this approach include the legality of mingling nuclear waste funds with other money, the administrative burden of developing internal capability, and duplication of effort. OCRWM could develop a program of its own, however this approach would have the same benefits and issues as the DOE-wide program, except that co-mingling of funds would not be an issue. Lastly, a mixture of the preceding options would allow a great deal of flexibility and may better address the needs of tribes. Having a custom-made program would create a huge administrative burden for OCRWM, though.

In response to a question by John Vincent, Ms. Turner said OCRWM intended to issue the final §180(c) policy in a rulemaking. Mr. Vincent said EEI had commented that OCRWM should allow for flexibility in administering funds, which EEI felt could not be accomplished if the policy was published through a rulemaking process. Ms. Turner said DOE staff believed they could write a policy with flexibility built in; in addition, there will be an annual review to see how the policy is working. She commented that one problem with writing the policy is the difference between the states in terms of their mechanisms and requirements. The mixed group of options seems to be the most likely of meeting success, but it also is the most difficult to administer. She noted that flexibility has consistently been one of the main issues of the commenters. In response to a question about deadlines, Ms. Turner replied that the final strategy did list major milestones. She asked if the committee had received copies of the Draft Strategy, and Ms. Sattler replied that copies had been distributed at the last meeting. Ms. Turner said once the committee members are added to the mailing list, they will receive the new strategy. She cautioned that some of the milestones are contingent upon MRS deadlines.

Mr. Miernyk asked what the role of the TEC working group would be in developing and implementing §180(c) policy. Ms. Turner said TEC will be asked to consider all five option groups in the development process, but implementation was so far down the line that she did not feel comfortable answering that aspect of the question.

Ms. Turner continued her presentation with a review of TEC activities. A total of 17 groups were represented at the first meeting, held March 31-April 1 in New Orleans. The invited groups are listed in the final §180(c) strategy. At the first meeting, the group identified major issues to be discussed at future meetings: general planning, public information and education, training, needs assessment and technical assistance, emergency management, compliance and enforcement.

The next meeting is scheduled for December 8-9 in San Francisco. Ms. Turner noted that meeting materials, including work plans, would be sent to all participants prior to the meeting. As recommended at the last TEC meeting, the membership of the group was expanded to include the American College of Emergency Physicians, the Emergency Nurses Association, and the National Association of Counties. Ms. Turner said members of the TEC receive funding from DOE to participate, however the meetings are open to all who wish to attend. DOE especially wants to encourage state organizations to send representatives, because representation at the regional level often results in some of the details being left

out. Mr. McCabe said the Midwestern High-Level Radioactive Waste Committee would be sending a committee member as well as a staff person to the next TEC meeting. Ms. Turner encouraged everyone to attend the meeting.

Ms. Turner briefly discussed the HMTUSA grant program. The final rule, which became effective October 19, allows planning grants to be used to assess local response capabilities, conduct exercises and drills, and provide staff for planning. Training grants may be used to assess employees who need training, to provide tuition, travel expenses, and per-diem to personnel, to conduct drills, exercises and tests of emergency plans, to monitor training and administer examinations, and to actually train staff. Funds are reimbursable, however arrangements can be made to receive funds in advance. A national curriculum is expected to be completed in June/July 1993. Grant application kits were due to be distributed in November, and would be due back February 1. OCRWM expects to award the first grants in March 1993.

In response to a question from Mr. Owen, Ms. Turner said DOT was the agency in charge of administering the grants. Mr. Moussa added that the governor of each state was to designate an agency to be the recipient of the HMTUSA grant money. He said the Emergency Management Department had been designated as the lead agency in both Missouri and Kansas. Mr. Crose added that the HMTUSA program in Indiana was tied into the state's SERC program, and 75% of the funding had to be passed through to local governments. Mr. Moussa said EPA had recently listed the designated representative from each state. In response to a question about whether the HMTUSA and §180(c) grant program were tied together, Ms. Turner replied they were not.

Ms. Turner said DOE has been monitoring the development of HMTUSA to try to make sure that the part of the act related to radioactive waste does not get swallowed up by the rest. HMTUSA is on a very tight Congressionally-mandated schedule, which does not necessarily accommodate the needs of the nuclear waste program. Ms. Turner said HMTUSA will set precedents but is not a substitute for §180(c). Mr. Moussa commented on the 75% pass-through. Under the planning guidance, this money has to go to the LEPC. Under the training guidance, however, the use of the word "benefits" implies states can keep that 75% and provide the training themselves. Mr. Moussa thinks many of the states will opt for this interpretation.

Ms. Turner said DOE is reserving the option of piggy-backing onto the HMTUSA grant program. Mr. Moussa said the HMTUSA money was initially predicted to be about \$13 million nationally, and now it has dropped to \$8 million. Ms. Turner added that the §180(c) money would be directed only to about 30 or 35 corridor states. Jim Miernyk said he thought the final rule mentioned allocation criteria would be published at a later date. Ms. Turner said OCRWM has not yet decided how to allocate the money. Mr. Moussa said each state already has an allocation, and that the formula involves §302 of SARA (extreme hazardous substance facilities), §304 (data on spills), and the size of the state's population. He commented that states with poor data wound up hurting themselves in terms of the allocation they received.

There was some disagreement over the matter of HMTUSA allocations, but Mr. Moussa and Mr. Crose maintained that their states had already received their allocation. Mr. Crose said a meeting of SARA Title III administrators addressed the matter. Ms. Turner said she was not involved with the HMTUSA coordinating committee, but to her knowledge the coordinating group is working on the allocation criteria. Mr. Moussa repeated that the allocations had already been made for both training and planning, and that the formula had been created by DOE, DOT, and EPA. Ms. Turner said she would try to get more information on the matter and pass it on to Ms. Sattler for general distribution.

Ms. Turner continued her presentation by saying that the institutional program was currently working on the development of routing criteria policy. A workshop at the last TCG meeting focussed on this issue. OCRWM is now in the process of preparing a strawman routing process based on the TCG input and will present the options for discussion at the next TCG meeting. The next meeting will probably be held in the spring. Ms. Turner said participants had commented that OCRWM should 1) make sure the appropriate people are invited to participate in the TEC working group, 2) include potential MRS state and tribal

hosts in TCG, and 3) hold the TCG meetings more regularly and frequently. Ms. Turner said OCRWM had hoped to hold TCG meetings twice each year, however logistically it does not seem to be possible.

Ms. Turner concluded her presentation with an update on the uniform inspection procedures being developed by CVSA for states to use for NWPA shipments. The procedures are designed to prevent having each state inspect shipments using different procedures. CVSA held a pilot class in August 1992 with participants from most of the WIPP states. Participants in the class commented on the CVSA's procedures, and in response the course was shortened from 4.5 days to 3 days. A revised set of procedures will be ready for the CSVA/DOE project training subcommittee meeting coming up in January. Another training course will be held February 23-25 in Woodburn, Oregon. When WIPP shipments are ready, classes will be scheduled to support the shipment schedule. Initially OCRWM assumed the WIPP shipping campaign would have started by this time and the classes would be scheduled around the shipments. Delays in the WIPP program have worked against this plan, however. It is possible to schedule training sessions in conjunction with other DOE shipments, however there is some concern that applying WIPP standards to other DOE shipments would not work well.

Mr. Borchert expressed concern over the uncertainty of the 1998 date. State agencies plan their budgets three years in advance, and it is difficult to project things out when there is so much uncertainty on the federal level. He said it will take his state 3-4 years to implement the process and programs concerning emergency response, and expressed his concern that DOE will not provide enough lead time to make the appropriate budget requests. Ms. Turner said DOE is committed to beginning §180(c) assistance three years in advance of shipments. Mr. Borchert said that was encouraging. Ms. Turner said the timeline now, assuming a 1998 shipping date, is to have a system in place and provide funds by 1995. Mr. Borchert said state agencies in Nebraska can receive grants but they still need the approval of the legislature to do so. Mr. Flater said that his state did not have the same problem with regard to federal grants, but hiring people entails its own process and takes a long time.

Ms. Turner said these comments indicated why it is so important for DOE to have states represented at the federal meetings, because each participant knows his or her own system. She stressed that this kind of information is essential for DOE to develop a flexible and workable program. Mr. Flater commented on all the talk of downsizing in his state. He said even if the federal government gives the state money, state leaders have political reasons for not wanting to increase the size of the government. He said an option would be to contract out, but doing so does not eliminate the problem of getting the money in a timely manner.

Mr. Borchert said another problem is bringing the legislators up to speed on issues. He said he has to start essentially 5 years ahead of time to get things accomplished. Mr. Lange seconded Mr. Borchert's earlier concern about coordinating between agencies, because Missouri has three separate agencies working on these issues. He then asked how much money had been authorized for §180(c) grants. Ms. Turner said no amount had been specified in the legislation and DOE was still looking at the matter. She consulted with Bill Teer, who indicated that a figure of \$5 million had been talked about. Ms. Turner explained that while the \$8 million in HMTUSA money was earmarked for all 50 states, the §180(c) money would be concentrated on the corridor states affected in the first year. She said the program was so embryonic that this issue really had not been discussed in detail. Mr. Lange pointed out that until a destination site had been selected, all the corridor states could not be identified. Ms. Turner said each affected state would still receive a larger portion of the §180(c) money than it would HMTUSA money.

In response to a question from Mr. Miernyk, Mr. Teer said Humboldt Bay (CA) had submitted a DCS.

Mr. Borchert passed out a sign-up sheet for anyone interested in receiving a copy of the *Handbook of High-Level Radioactive Waste Transportation*. He asked interested committee members to speak with him later about the possibility of attending the TEC meeting in San Francisco. Mr. Borchert then introduced the next speaker, Mr. Lake from OCRWM.

### ***Program Overview***

Mr. Lake said he would first discuss cask design and then review OCRWM's cask program. He said only about 10% of the weight of the cask is made up of the payload. He discussed the structure and composition of fuel assemblies and passed out a one-ninth section of a PWR assembly for display. He then described the characteristics of spent and fresh fuel, and noted that irradiated fuel hardware is a large source of gamma radiation. Cooling time significantly reduces the emission of gamma and thermal radiation -- after five years, the fuel emits 20% of the radiation it did after 150 days. Cooling time does not have the same effect on neutron radiation.

Mr. Lake mentioned the NRC regulations pertaining to containment, shielding, and the maintenance of subcriticality. He described the tests that must be performed to verify a cask's ability to withstand both normal operating conditions and hypothetical accident conditions (the latter being performed sequentially). He commented that NRC regulations cover all types of packages and not all the requirements actually affect shipping casks (e.g., external pressure and water spray). With regard to hypothetical accident conditions, Mr. Lake said the cask is expected to be damaged, but it must still be able to meet containment, shielding, and subcriticality requirements.

He noted the importance of impact limiters in protecting the ends of the cask, one of which has a lid and the other an irregular surface. He then discussed the differences between target hardness for the drop tests. Mr. Moussa asked what materials are used for testing impacts on an "unyielding surface" and Mr. Lake replied that concrete covered with steel armorplate is used as an "essentially unyielding" surface capable of minimizing both the motion of the system and absorption of energy.

Mr. Lake then described the fire test and applicable regulations. He said the temperature at the center of the fire could reach 1100 °C, but noted that 800 °C is NRC's fire specification. He explained that the 800 °C represent an average of temperatures at various positions within the fire. He described casks as high capacity, medium resistance with regard to heat absorption.

Mr. Lake went on to describe the materials used to make casks. Hydrogen-containing materials, such as water and polymers, provide neutron shielding. Boron can also be added to improve neutron shielding. The bulk of the cask's weight comes from the material used to provide gamma shielding, primarily lead, depleted uranium (DU), or iron. He said one way to keep the weight and expense of the cask down is to place the more dense materials towards the center so less material is used. Impact limiters are commonly fabricated from wood, foam, or honeycomb material, while seals are elastomeric (e.g., rubber). Mr. Lake also discussed the effects of stress and strain on the various materials. He passed around samples of high and low ductility materials that had been subjected to different stresses.

Mr. Lake began his discussion of OCRWM's cask development program by reviewing the general goals of the program. First, the program assures public health and safety by working within NRC regulations. Second, such measures as developing high-capacity casks enhances the efficiency of the program. Third, OCRWM works to satisfy the physical needs of the federal waste management system. For instance, the program must interface with commercial reactors and federal facilities. Mr. Lake admitted that OCRWM could do a better job interfacing with reactors, and he mentioned that the independent management review group had looked into this matter. He also noted the difficulty of interfacing with federal facilities when they have not yet been designed. Fourth OCRWM must meet schedules. Mr. Lake acknowledged that meeting a goal of 1998 would be tough to achieve. Finally, the program must address public concerns.

Mr. Lake said a 2-phase cask program had been developed to help meet the program schedule. Near-term transportation needs will be addressed by using existing cask technology to fabricate casks that have already received NRC approval or to design new casks. He said only one of the approved casks would be easy to duplicate. Over the long term, OCRWM would continue its efforts to increase the capacity of casks, specifically increasing truck cask capacity by a factor of 4, rail/barge by 2-3. Currently, the first phase is nearing the RFP stage, and OCRWM expects to award contracts some time in 1994. The department is currently reassessing the high-capacity designs developed as part of phase 2, and it expects to submit the LWT design for NRC review in 1994. The rail/barge design may have to wait until late 1995 at the earliest.

Mr. Lake then discussed the analysis and testing of casks. He said casks are designed by analysis, followed by engineering tests to fill in the gaps in knowledge. Lastly, model tests verify design analysis. He cited several reasons for design verification tests using full scale casks. First, although full scale testing is not required for spent fuel casks, it can expedite NRC certification. Mr. Lake noted that full scale testing is required for TRUPACT II containers (partly as a result of state concerns). Second, model tests verify only the structural design of the casks -- they do not address thermal design and only qualitatively address containment design. Full scale testing would clearly address all three design factors. Third, full scale testing may work to enhance public confidence in the safety of the containers, whereas testing scale models does not seem to have the same effect. Mr. Lake cautioned, though, that any full scale testing would have to be carefully planned to avoid having to redo tests if it turns out another test would have been more appropriate.

Mr. Hand asked if OCRWM had looked at how increasing the capacity of rail/barge casks would affect the ability of utilities to move casks from the receiving area to the fuel floor. Mr. Lake said the increase in capacity would be accomplished in part through the need for less gamma shielding, since the IF-300 (existing rail/barge cask) was designed to carry fuel that was 5-6 times hotter than what would be shipped in high-capacity casks. He said doubling cask capacity would not significantly increase the weight of the cask. He also mentioned that the FICA study had looked at this question, however the study was going on at the same time cask designs were being developed. Part of the reassessment of the designs involves getting the FICA information to the cask manufacturers.

Mr. Miernyk asked what NRC-licensed cask could be fabricated for use at this time. Mr. Lake said the NAC-LWT was a standard truck cask with a capacity of 1 PWR/2 BWR. Mr. Miernyk then asked Mr. Lake to comment on an article that referred to the existing commercial cask fleet as insufficient to meet the demands of the first five years of federal waste management operations. Mr. Lake said the new-design casks will be used as soon as they are ready, and said the statement did not consider the case of adding new casks to the existing fleet. With new phase-1 casks, OCRWM hopes to get a little higher capacity than the existing ones -- e.g., the lower heat may allow a jump of 1 to 2 PWR assemblies per truck cask.

Mr. Miernyk then asked about criticality and the structural design of casks. Mr. Lake said the main thing a cask provides is containment, and keeping things from leaking out is a tighter requirement than keep things from getting in. Criticality safety is provided by the structure of the fuel basket and by neutron poisons in the basket. In addition, the absence of water is important -- as long as water is not part of the system, there is no real chance of criticality taking place. He said the calculations for criticality already have margins in them, and that these were worst-case calculations, unlike those for thermal and structural designs. He also noted that maintaining criticality is different from designing for thermal and structural loadings, because while these two vary by degrees, criticality either happens or it does not.

Ms. Sattler said the minutes of the WIEB High-Level Waste Committee meeting (held in April 1992) cite Mr. Lake as saying DOE would respond to the GAO report on OCRWM's cask design program. She asked if the department had responded and, if not, when it plans to do so. Mr. Lake said GAO comments and recommendations are always tracked and DOE has to report back to GAO on a regular basis. Ms. Sattler asked if these reports were publicly available, and Mr. Lake said both GAO and DOE have open files in that regard.

Susan Hiatt asked if any dual-purpose casks are currently under NRC review for licensing. Mr. Lake referred the question to Mr. Chuck MacDonald, who said Nuclear Assurance Corporation (NAC) has a storage/transportation cask under review. He said other concepts are in place, including modules. NUHOMS, for instance, has a fuel basket that is placed in a concrete bunker and later can be placed in a shipping cask for transport. Mr. Lake said the dual-purpose concept is probably not hard to do, but no one has done it yet. Mr. MacDonald said that Rancho Seco would probably be the first utility to move towards it. He said the utility had not yet submitted an application, but the concept is being actively pursued. In response to a question from Mr. Halstead, Mr. MacDonald said NAC was close to following through on NRC review of its dual-purpose cask.

Mr. Borchert asked what impact the new 10 CFR 20 regulations will have on cask designs. Mr. Lake said DOE has had its cask contractors look at the matter, and they found it really did not appear to have an impact for their casks.

Mr. Borchert then introduced Mr. MacDonald from the U.S. Nuclear Regulatory Commission.

### ***Regulatory Requirements***

Mr. MacDonald passed around a section of a full-scale unirradiated BWR fuel rod containing some simulated pellets. He said NRC's goal is to protect public health and safety by making sure casks provide adequate shielding and containment and maintain subcriticality.

Mr. MacDonald said both NRC and DOT deal with the transport of radioactive waste. NRC works on the packaging of fissile material and materials with higher levels of radioactivity. In addition, it has physical protection requirements or safeguards. NRC also has overall quality assurance requirements that apply to the transportation program. DOT works on packaging for the low-level materials and has all the requirements that involve driver and vehicle requirements. DOT has control over hazard communications requirements, e.g., what information goes on the shipping papers and on the vehicles, and what information will be immediately available to people responding to incidents in transportation. NRC has incorporated DOT requirements into its regulations. FEMA is also involved in that it provides emergency response planning and training at the federal level.

Mr. MacDonald noted that cask design, fabrication, and use all interact. One section of NRC's regulations is devoted to reviewing cask applications and issuing design approvals. So far, NRC has approved 185 package designs, and the commission takes about 100 actions a year regarding new packages, amendments, or renewals. NRC has issued about 400 quality assurance program plans to its licensees, 50 of which cover design and fabrication and the remainder primarily for use. Two years ago, NRC had more quality assurance program plans, however the commission is now under full-cost recovery, so licensees must pay a fee for the plans. NRC conducts about 10 inspections per year specifically to observe cask fabrication.

NRC also looks at the maintenance of the package. The lifetime of the cask is noted on the certificate of compliance, but not on the package itself. For each use of a package, a person must determine that the package is appropriate to use for the specific contents and that it is in unimpaired physical condition. Five regional offices oversee field inspections. In all, NRC conducts about 1400 inspections each year.

Under 10 CFR Part 71, NRC's requirements for shipping casks cover application for package approval, package approval standards, package tests, operating controls and procedures, and quality assurance. Mr. MacDonald discussed the hypothetical accident conditions, noting that they must take place in sequence: free drop, puncture, thermal, immersion. He said these hypothetical accident conditions probably draw the most attention yet they also have the least impact on the public, since NRC spends a great deal of time on the normal conditions (e.g., dissipating the energy that goes into the package).

Mr. MacDonald discussed several transportation studies. In 1972, NRC conducted an environmental survey of transportation to and from nuclear facilities to implement NEPA requirements. From 1975 to 1977, when NRC was part of the old AEC, the commission looked at shipments made up to that point (2.2 million packages being shipped per year) and determined that the existing standards and requirements were adequate for the protection of public health and safety. Lawrence Livermore National Laboratories conducted the study. They looked at hundreds of thousands of real accidents to see how a cask would respond if it just met the NRC requirements. Mr. MacDonald pointed out that there will be accidents with these casks, so it is important to assess what the impact will be. Minor functional damage is expected to occur every 40 million miles, and every 80 million shipment miles one accident is expected to result in a radiological hazard slightly exceeding NRC limits (80 million miles is the projected number of miles required to move all the fuel accumulated now to a storage site or repository).

Mr. MacDonald discussed proposed changes to the regulations and associated issues. In response to 1985 IAEA recommendations for safe transport of radioactive material, changes have been proposed for 10 CFR 71. Changes are also being made in A1/A2 values, which determine the amount of radioactivity that can go into a package that does not meet the accident conditions (if the level is above, the material must go into a type B package). Fissile classes 1, 2, and 3 are being replaced by the designation "fissile packages," which is comparable to what we now know as fissile class 2. Crush tests will be applied to lower weight packages, such as those used primarily for shipping plutonium. The test involves dropping the package onto a hard surface and also dropping a weight on the package. Irradiated fuel packages will have to endure immersion in several hundred meters of water without any in-leakage.

Mr. MacDonald then reviewed four regulatory issues and noted that compatibility was a fifth, overarching issue. First, there is no doubt that when fuel comes out of the reactor it is less reactive than when it went in, yet the question remains of demonstrating the amount of fuel burnup. Second, fracture toughness is of great importance, so NRC is continually looking for high-quality material. Third, the IAEA feels there is no need for requirements on seagoing vessels, but NRC disagrees. Lastly, NRC is grappling with the issue of system certification, which primarily involves declaring a system to be safe even if it does not meet any specific standards.

Mr. Flater asked Mr. MacDonald if he felt the new 10 CFR Part 20 will have any impact on cask design as it relates to the OCRWM program. Mr. MacDonald replied he did not think it will because the dose release limits that apply are based upon accident conditions, and the new part 20 (which is driven by international ICRP 60-61) will not have an impact on that part of the design. Mr. Flater asked Mr. MacDonald to clarify whether in using the term "compatibility" he meant compatibility as it relates to agreement states or as it relates to general, overall issues. Mr. MacDonald said compatibility should always be an issue. As far as Part 71 is concerned, agreement states are not compatible. They do not have the overall quality assurance plan that the NRC has, so if they come under NRC's jurisdiction, this may create an issue. Mr. Flater agreed, and said several licensees in his state have asked why NRC is licensing state entities when the state presumably has that authority. Mr. MacDonald said whether or not the facility is in an agreement state, the NRC would be involved if the licensee is at a federal facility. Mr. Flater stressed the importance of the federal and state governments agreeing on a definition of compatibility. He commented that it seemed every time a new regulation came out, a new definition of compatibility applied. He then said NRC would be more successful working with states if it sells new regulations as a health and safety issue. Mr. MacDonald agreed, and said reaching consensus was a very difficult problem.

Mr. Miernyk asked if NRC had any interest in revisiting the modal study to redefine some of the assumptions. Mr. MacDonald said he thought time could be spent in much better ways if the goal is to improve safety. He said other people may be looking at the modal study, but NRC was satisfied with it.

Mr. Borchert again introduced Mr. Lake, who spoke on the new-generation fuel casks.

### ***Design and Features of High-Capacity Truck and Rail/Barge Casks***

Mr. Lake said DOE issued the RFP for new casks in 1986 and received 47 proposals from about 17 different companies. Several different cask types were covered by the RFP -- LWT, rail/barge, OWT, dual-purpose (both the latter two have not been pursued under contract). Out of the submissions, five contracts were awarded in 1988, two of them LWT and three rail/barge. By 1991, DOE had decided to focus on just two casks, mainly because of funding and different priorities in the program. Currently the department is pursuing General Atomic's LWT casks (actually, two very similar casks for BWR and PWR fuel) and Babcock & Wilcox's BR-100 Rail/Barge Cask. The new casks will be designed to NRC standards but with higher capacities, which leads to fewer shipments and lower costs. DOE also believes they will reduce risks.

Mr. Lake discussed the differences and similarities between new and current technology casks. Existing casks have already been approved by NRC. Two are LWT and one is a rail/barge cask which actually is a little lighter than the BR-100 (100 tons). Both truck casks are about 25 tons, both have capacities of 1

PWR/2 BWR. The NLI 1/2 takes fuel that has been cooled a little over 6 months, whereas DOE's new casks will carry fuel cooled for 5 to 10 years. The NLI cask uses half lead, half DU to just meet gamma shielding requirements. DOE's new cask designs use solid polymers for neutron shielding, whereas existing casks use water. Water has some advantages in that it transfers heat more easily than polymers. Both LWT casks have a circular cross-section. The IF-300 rail/ barge cask weighs 70 tons and holds 7 PWR/18 BWR assemblies. Mr. Lake thinks this figure has actually been reduced to accommodate channels on the BWR fuel, so it is now 17. Gamma shielding is all DU because of sizing considerations. Water is used for neutron shielding and the cask has a circular cross-section.

Mr. Lake then reviewed the features of the GA truck casks. The reason for having two separate cask bodies is to take further advantage of the characteristics of PWR and BWR fuel. For the same age and burnup limits, the PWR cask would need thicker shielding. The BWR cask, in turn, needs to be longer. It makes more sense to have two separate bodies, provided there are a sufficient number of each type of shipments to make it economical. Cooling time is optimized at around 10 years under specific burnup conditions, but DOE is also working on specifications for 5 year cooled fuel to satisfy the terms of the standard contract. Both casks use DU for gamma shielding, and polymers with 1% boron for neutron shielding. Both have a square cross-section. The GA-4 is 14-15 feet long, and the GA-9 is 10 to 12 inches longer. Impact limiters on the ends are made of aluminum honeycomb, which is lighter than balsa or foams typically used today. The inner stainless steel lining of the casks provides structure, not containment. DU gamma shield is surrounded by another layer of stainless steel that does provide containment. The dimensions of these layers differ with the type of fuel -- e.g., the gamma shielding for PWR is 2.63 inches thick, compared to 2.45 inches for BWR.

The BR-100 rail/ barge cask has a circular cross section, weighs 100 tons and is designed to hold 16 PWR/37 BWR, although this figure might be changing to 21/37. The rail/ barge cask has the same design points with the same minimum age as the truck casks. The fuel baskets are made of borated aluminum plates to provide criticality control and are attached with stainless steel. The containment vessel (stainless steel) is right outside the basket system. The BR-100 uses lead for gamma shielding (efficiency is not as important with rail/ barge transport as it is for truck transport, which has stricter weight limits). The neutron shield is made of a borated concrete system that has been used in Europe for a number of years. One advantage of this system is that it is not as affected by heating and fire conditions as other materials, and adding a system of copper fins would maximize heat transfer. A thick outer steel shell protects the borated concrete and everything else inside. Lastly, the impact limiters are made of wood with a thin steel shell to hold the limiters in place.

Mr. Lake said higher capacities are achieved by optimizing cask design, primarily with regard to fuel age. Based on the fuel being cooled for 10 years rather than 120 days, using DU shield rather than lead, building separate PWR/BWR casks, and using a square rather than circular cross section, Mr. Lake estimated a savings of 10-11 tons on an otherwise 37-ton truck cask. About 59% of the weight savings would be derived from designing for older fuel. More efficient shielding yields a savings of 18%, while separate bodies contribute 14%. The cross section makes up the remaining 9%.

Another way DOE is hoping to cut costs and increase capacities is to consider burnup credit for PWR fuel. Currently, subcriticality calculations and demonstrations are simplified by assuming the reactivity of the fuel being shipped to be equivalent to fresh fuel. Using burnup credit requires a great deal of work, though. The so-called end effects must be determined -- that is, differences in burnup occur along the length of the rod, and one cannot simplify to an average across the entire rod. One factor to consider is the fact that not all the reduced reactivity needs to be credited -- rather, cask designs can take advantage of as much as burnup credit as is necessary to simplify the design to allow closer spacing.

Mr. Lake pointed out that DOE must be able to demonstrate casks are loaded properly. He said some of the fuel to be shipped falls fairly close to the "loading curve," and this is of concern to both DOE and NRC. The agencies have agreed in principle on the method of attacking the problem: developing a fairly simple measurement technique which would utilize the reactor fuel records. Each assembly would be measured in the early days of the program to verify the fuel records. One thing to avoid is developing an elaborate

measuring process that ties up the reactor system for weeks. The system being considered for use would have a minimum intrusion on reactor operations.

Mr. Lake reviewed the matter of regulatory compliance. The NRC rules are very general with regard to containment. NRC's guidance to its licensees endorses American National Standards Institute (ANSI) standard N14.5, which is what DOE is using for its designs. Shielding is another issue. Mr. Lake said since existing casks were built for 120 day cooled fuel, the dose rate measurements for 5-10 year cooled fuel will be just about zero because the cask is clearly over-designed. DOE is trying to design its new casks right up to the standards, which have margins built into them. This approach has created some concern on the part of the public, with people worrying that the doses will too high. Mr. Lake said the answer to this potential problem is to measure the dose before shipping, which is already a requirement. He said the utilities are also concerned about this design feature, because they do not want to load a cask and then have to spend time removing fuel if the dose measurement exceeds the required rate. Mr. Lake said the utility concern is a little harder to address, and DOE is trying to do that through the development of some sort of shielding benchmark using field data from Idaho.

Mr. Lake then discussed weight limits. The legal-weight limit for trucks is 80,000 lbs (40 tons) without a special permit. The LWT cask is very close to 26 tons, leaving only 14 tons for the trailer and truck. DOE is designing a special trailer for these shipments and also is looking into identifying a suitable tractor. Since the new trailer is designed to be lightweight, DOE wants to test it over road conditions with an accelerated life test simulating 200,000 to 250,000 miles. Mr. Owen asked if there would be a 25-ton weight on the truck, and Mr. Lake replied there would be and it would be distributed in a way that resembles the cask system. The rail cask faces a 100-ton limit, based primarily on utility hook loads. Mr. Lake said no matter how much cask capacity increases, the payload will still make up only a very small fraction of the overall weight of the shipment (3-7.5% for current casks, 12% for new designs).

In conclusion, Mr. Lake said he definitely believed DOE was going to achieve higher capacities with the new casks while still maintaining the same safety standards. Weight savings do not affect the structural or thermal systems -- all they do is reduce gamma shielding by being tailored to older fuel and to the shape of the fuel, none of which takes away from cask integrity.

### ***Independent Management Review Group's Report on OCRWM's Cask Development Program***

Mr. Borchert introduced Mr. John Vincent of GPU Nuclear and EEI/UWASTE.

[A transcript of Mr. Vincent's presentation is attached.]

Mr. Miernyk said he was pleased to see that many of the concerns raised by EEI/UWASTE were similar to the comments submitted by WIEB. He asked if the utilities are satisfied with model testing or if they feel full scale tests should be conducted. Mr. Vincent said his colleagues on the review group are engineers and understand the suitability of using scale models. He thinks the issue of full scale testing is related more to public perception than engineering. One of the problems associated with full scale testing is the question of where to stop. Casks are expensive, and requiring a number of different tests, each using a new cask, can get very expensive without providing any additional information that adds to protecting public health and safety. Mr. Miernyk asked if there are enough changes in the new cask designs -- e.g., the use of significantly different materials -- to merit considering full scale testing for more than public acceptance purposes. Mr. Vincent said he did not think so because the materials being used in the new casks have been used in other applications.

Ms. Gilham asked Mr. Vincent if the unresolved issues he had referred to were documented elsewhere. Mr. Vincent said the reviews of both the preliminary design reports and the drafts of the final design reports (for the GA and BR-100 casks) contained this information in great detail. OCRWM has copies of the reports.

Mr. Halstead commented on the similarity between the conclusions reached by the independent review group and the state of Nevada. Nevada had looked quite critically at the preliminary design reports. The

three people assigned to the task represented a range of ideological positions and perspectives. The three consultants independently came up with very similar criticisms, particularly regarding the BR-100 rail/barge cask. Mr. Halstead said his faith in the system had been restored by DOE's decision to convene a review group, although he felt the group was not as "independent" as it might have been. The state of Nevada is anxiously waiting to see how DOE follows up on the report. He said Nevada can be less diplomatic than the utilities, e.g., they think the rail cask ought to go back to the drawing board. He said the state's concerns are different from the utilities, who are focusing on the need for a high-capacity truck cask. Nevada feels the majority of the shipments should be by rail, so if a rail spur cannot be built out to Yucca Mountain, the site would be eliminated from consideration as a repository site.

Mr. Vincent clarified his earlier remarks. The IMRG told DOE not to continue with the current BR-100 design contained in the draft of the final design report. Since that time, the IMRG has heard presentations from B&W including additional information about the design concepts and how the designs would be changed to correct the items that had been identified as flawed in the original. Some of the B&W work was convincing, so the IMRG gave DOE the option of going ahead with the BR-100 cask if B&W can show from a schedule and cost perspective that the redesign effort might be appropriate. He stressed, though, that the current design was not acceptable.

Mr. Halstead said the state of Nevada is hoping the report creates an opportunity for rethinking some of the larger issues in the cask program. For instance, some debates are going on about what the waste package materials at Yucca Mountain would be and what the implications are for maintaining the appropriate temperature at the repository horizon, which in turn has implications for the order in which utilities ship their fuel.

Mr. Halstead asked who was on the IMRG. Mr. Vincent said he was the only utility person and therefore was the person most concerned about costs. Mr. Ray Lambert at EPRI in California has a great deal of technical skill and knowledge. Mr. Vincent said his impression was that most of the people participating in the review were extremely forthright and honest in their appraisal of the system. In closing, he commented that this document is to a large extent retrospective in that it looks back at things that transpired, in most instances, a year or two ago. He said during that time, there has been an attitudinal shift at DOE on the storage and transportation side, and things have gotten much better with regard to how tasks are performed to meet program goals.

Mr. MacDonald said the NRC was offered the opportunity to review the design reports and declined because at some point the commission will have to review the package certification. NRC will have preliminary meetings with the applicants (GA and B&W) prior to the certification review process to make sure the applicants fully understand what is required.

Mr. Lake commented that DOE created the IMRG because the department realized there were problems with the cask designs. He said many groups commented on the designs and still have not received a formal response, but the department has tried to respond informally. The fact that even DOE's internal comments had not been resolved or adequately addressed was the motivation for forming the review group. Mr. Lake thought the group had helped DOE a great deal, and that one side benefit is a restructuring of the way DOE now handles the cask program. Another very important step is making sure the contractors monitor and track comments made by industry, regional groups, and other interested parties.

Mr. Borchert introduced Mr. Halstead, from the Nevada Nuclear Waste Project Office.

### ***Comments on Cask Testing and Development***

Mr. Halstead distributed copies of his presentation, which summarized what the state of Nevada has recommended to DOE over the years as a "super-safe transportation system" for HLW based on available technologies and what the state believes to be reasonable costs. He stressed that he associated the issue of cask testing with public confidence and public acceptance of shipments. From all the public opinion survey work that the state has done, and from other work conducted in the western states, it is clear that

there are some real problems with public lack of confidence in nuclear waste transportation or, looked at another way, public perception of risk. He stated his belief that many of those concerns do have some technical basis.

Mr. Halstead said while Nevadans do not want the repository to be built in their state, they want to make sure DOE develops a transportation system that *deserves* public confidence whether it actually gets approval from the general public or not. The experience in planning for the WIPP shipments demonstrates that when shipping containers are subjected to full scale testing, or when a very strict set of protocols is developed for hiring, training, and monitoring drivers, the attitudes of the "official public" clearly change. Mr. Halstead noted that dealing with the general public is very different from working with the "official public," which includes people such as state officials and first responders. He said his advocacy of full scale testing stems from his belief that doing so would allow DOE to say it had earned public confidence, although he admitted doing the right thing does not necessarily mean getting public confidence.

Mr. Halstead reviewed the state of Nevada's position on testing. First, testing is just one aspect of the larger issue of cask development. The state's position is that some of the mistakes made in the DOE cask program might not have been made if DOE had a better process for taking input from the stakeholders. Mr. Halstead said he was glad to hear DOE is rethinking how to work with stakeholders. Specific areas for stakeholder input are the development of cask testing protocols and the selection of test facilities and personnel, since public confidence is not likely to improve significantly if DOE decides on its own how to approach cask testing. Mr. Halstead pointed to the way the state of New Mexico was involved in developing the test program for the TRUPACT containers at Sandia. The state of Nevada is also seeking a DOE commitment to full scale physical testing of cask prototypes prior to NRC certification -- i.e., actually taking a prototype through the four regulatory tests in sequence. The state is not arguing for a change in the NRC's regulations, although it has pursued this course in the past.

A fourth issue involves determining the standards to which casks should be tested. Mr. Halstead said he had great respect for the work that NRC and Lawrence Livermore put into the modal study; however, notwithstanding this respect, the state of Nevada thinks there are sufficient differences between the cask designs DOE is developing and the ones assumed in the modal study to warrant reexamination of the study's conclusions. Specifically, the modal study's focus on cask shell failure is too narrow -- greater attention should be paid to strains on the cask that would not necessarily rip a hole in the shell but could cause a less dramatic failure in the bolts or the seals. The state has also investigated a number of real accidents that would have created greater impact forces and/or greater thermal loadings than what was considered in the modal study. Mr. Halstead said the state of Nevada and WIEB had signalled their willingness to be part of a cooperative reexamination of these issues in the modal study.

Fifth, the state is interested in an evaluation of the potential benefits of testing a production model cask, which was the first position on cask testing the state of Nevada developed. Mr. Halstead said this suggestion had been kept alive because it is difficult to back off from something that originally looked like the best idea. One of the arguments for testing a production model cask as opposed to a prototype is the fact that the prototype will be hand-made with a great deal of attention. As a result, the cask will not give an accurate indication of how, for instance, the 47th cask of a run of 186 will perform. One problem with this approach is that destructively testing casks after already becoming committed to a design and manufacturing several casks raises obvious questions about what happens if problems are uncovered in testing. Because of this problem, the state now feels it is best to test early and try to find the flaws before becoming committed to a cask design and fabrication process.

Mr. Halstead said while it may resolve many issues, full scale testing cannot settle all the controversies surrounding nuclear waste transportation. He thinks the key is public confidence, and testing is one part of a hardware development program that allows DOE to earn (rather than just assert) public confidence. There also are some technical benefits -- e.g., finding out if a specific cask design actually meets the NRC requirements. Perhaps more importantly, full scale testing is the "ultimate QA test." Mr. Halstead thinks there is great value in generating this kind of test data, such as obtaining good benchmark codes for a variety of worst case scenario simulations. He agreed it would be impossible to test for every conceivable

insult that might be presented to a cask in operation, but he thinks people often overlook the value of full scale testing in providing a better basis for looking at a number of different scenarios.

Mr. Halstead said one thing testing cannot do is definitively prove the ability of a cask to survive a worst case accident or sabotage incident. It also will not change the need for other types of regulation -- e.g., even if a cask is successfully tested, the state of Nevada will continue to support highway routing regulations to keep truck shipments away from highly populated areas. Full scale testing also will not change the state's position that the safest and most effective mode would be shipping in dedicated trains rather than general service freight trains. Nor will full scale testing address all the concerns about human factors and the need for continuous attention both during the fabrication process and operations to prevent human error that might undermine the integrity of even the best cask designs. Mr. Halstead stressed the important point is to put the cask testing issue in its perspective. The state of Nevada strongly supports full scale testing, but it still is only one part of a super-safe transportation system.

Mr. Halstead then made a few remarks about the upcoming videos. A real controversy has been going on in Nevada over the use of the Sandia crash test films that were done in the late 1970s. The state thinks DOE improperly uses the films by showing them at its public information center in Las Vegas and at public meetings to assert that casks are safe because casks were tested at Sandia in the past. The state has always said that it appreciates the test program conducted at Sandia and acknowledges that a great deal of beneficial information came out of those tests.

The most heated conflict over the use of the films has occurred since September 1991 when the American Nuclear Energy Council (ANEC) started a massive public relations campaign to generate support for the repository program. ANEC hired a public relations firm to put together television ads for broadcast in Nevada. The news documentary coming up gets in to the way those ads have used and misused the Sandia test results.

The third video, commissioned by the Central Electricity Generating Board of Britain, shows both the demonstration tests and the regulatory tests conducted in Britain on a shipping cask for Magnox reactor fuel. The fuel and the cask are different from the kind used in the U.S., however Mr. Halstead feels the film is still useful. The state of Nevada commissioned Lindsay Audin to prepare a critique of the way the Sandia films were being used. The report discussed the approach taken in *Operation Smash Hit* as having much more technical integrity and being much more educational than the Sandia films as they are currently used.

Lastly, Mr. Halstead said Nevada's concern and involvement with the test film issue stems from its experience with the cooperative planning between the Western states and DOE's EM people in planning for the TRU shipments to WIPP. He said one of the most effective training tools for that program is a video prepared by the state of Idaho. One of the most convincing aspects of the video is footage of a TRUPACT container being dropped over and over again and going through a fire test. Mr. Halstead said it is a very powerful tool, particularly in terms of the ER community in that it gives them an accurate portrayal of the thought that went into the development of the package. He hopes DOE will eventually agree to full scale testing of the packages being designed for the MRS and repository shipments.

Ms. Sattler said there had been a mixup in the process of copying Mr. Halstead's handout, and she would make sure all participants received a complete copy in the mail.

**Cask Testing Films**

After viewing *Accident Safe*, someone asked what happened to the locomotive used in the tests. Mr. Sanders replied that they had finally gotten rid of all the equipment used in the tests about three years ago because it was an environmental hazard to keep it on site. Mr. Sanders said as far as he was concerned, the film contained the complete record of the tests. Mr. Halstead commented that the state of Nevada's critique of DOE's use of the cask testing films found fault with the 4-minute loop of outtakes, not the 14-minute film. He also said the real objection to the ANEC ads is that they combine clips from the Sandia films, from *Operation Smash Hit*, and from films of scale model tests into 48 seconds of ads. Mr. Sanders stressed that the film states the reason for the tests -- to test the predictions made by computer models used in the testing of scale models of casks -- and that what happens with the films now is out of Sandia's control.

Mr. MacDonald commented that before Operation Smash Hit, people in the U.K. pointed to the Sandia cask tests as evidence that the U.S. cared more about its casks than the U.K. Operation Smash Hit was developed in response to this criticism. Greenpeace raised some objections to the tests, however after a second video was made, Greenpeace backed down. Mr. MacDonald said full scale tests generate new information about the casks. He also pointed out that the casks tested at Sandia are not current generation and would not be used today.

Mr. Halstead said one of the things he liked about the British film is that it shows footage of both the regulatory drop tests and the demonstration test. He noted that, although the film did not call attention to the fact, the cask actually experienced at least twice the impact from one of the drop tests (onto an unyielding target) as it did when hit by the train. Mr. Halstead said he was concerned about the use of these dramatic demonstration tests, which are great from a public relations standpoint but fall short in terms of showing regulatory compliance. Mr. MacDonald commented that when the Sandia tests were conducted, the industry showed NRC the footage of the tests and asserted the films would free them from having to perform any more demonstrations. NRC disagreed and said the cask manufacturers still had to demonstrate compliance with the regulations.

The second film consisted of a series of news segments from a Nevada television station. After viewing the film, Mr. Sanders pointed out that the news crew had twisted the truth to some extent. Mr. Halstead said he thinks it is a sad commentary on the state of things in Nevada, and said the Nevada TV station conducted the investigation shown in the film only in response to the furor over the ANEC commercials. He commented that ANEC bought the opening and closing minutes of *Monday Night Football* for the whole season, in addition to buying the middle (highest ratings) spot, for the better part of a season, of *Wheel of Fortune*, which is the highest rated show in Nevada. According to what the state has been told, ANEC committed \$9 million over a 3-5 year period to develop these ads and to buy airtime. Mr. Halstead noted that a great deal of testing could be done with less money. He said for four years his organization has included in its budget proposal a request for \$55,000 to do a 22-minute video which would provide an objective overview of all the safety issues, but his organization does not have enough money.

Mr. Halstead also pointed out what he thought to be one of the key issues in the second film -- namely, the interview with two Sandia scientists in which each said he considered the casks to be safe. He noted that the scientists did not base their opinions on the cask tests. Ms. Turner expressed concern that people would view these news segments and hear the message that someone is lying to them about the safety of the casks or the significance of the films. She said the average person would not distinguish between Sandia, DOE, and ANEC. She mentioned that the question of responsible journalism had come up before during this meeting, and noted the media often has very good points to make but twisting the information can really skew the outcome. Mr. Halstead noted that Carl Gertz (director of the repository program in Nevada) is not happy to have the ANEC media campaign as the backdrop for every week's news coverage since September of last year. He would rather have the focus be on the debate between Nevada and the DOE over technical issues.

Someone asked if ANEC was still running ads, and Mr. Halstead said the ads now focus on storage and disposal. He mentioned that statewide polling conducted three months after the ads started running revealed incredible recognition -- over 70% statewide. About one-third of the people in the state live in areas that do not receive Las Vegas TV by cable, so it was close to 100% recognition in areas that had Las Vegas TV. About 52% said the ads had no impact on them at all, 34% said the ads made them more negative towards DOE, while 15% said they made them more positive. Mr. Halstead cited these results as evidence ANEC is not getting much positive bang for its buck. He also agreed it is very difficult to get the media to report the facts accurately.

Discussion ensued over the news segment showing penetration of the cask through an act of sabotage. Mr. Lake said this situation was studied extensively not only at Sandia but by NRC. Mr. Halstead commented that he had never seen the sabotage photos before, and Mr. Sanders said they had been classified. Mr. MacDonald said when NRC prepared the environmental impact statement in 1975, there was some question as to whether or not casks were vulnerable to sabotage. Physical protection requirements were developed in response, and now NRC requires, for instance, armed guards for shipments travelling through heavily populated areas. Mr. MacDonald said two sets of experiments were conducted, at Sandia and at Bechtel Memorial Institute in Columbus (the latter sponsored by NRC). The tests revealed that cask penetration is possible, but the consequences would be low -- essentially less than one latent cancer fatality. He stressed that these tests were conducted in the interest of public health and safety and to answer questions the NRC felt needed answers. Mr. Halstead said he feels fairly secure about DOE's ability to design, build, and operate casks and maintain safety in the accident environment, but he is concerned about the possibility of sabotage.

Mr. Borchert said before viewing the third film, it would be interesting to take a straw poll about how the committee feels about full scale testing versus model testing. He mentioned that Ms. Sattler would probably be contacting committee members in the coming weeks, but it would be good to discuss the matter before the meeting breaks up. He started off the discussion by saying that he had the opportunity to look at some films put together by Peter Sandman, who is a risk communicator at Rutgers University. Professor Sandman feels the public does not trust or believe engineers, and as a result he thinks it is futile to tell the public the system is safe and expect them to believe it. Mr. Borchert said his years of experience in health physics has convinced him that comparing doses to x-rays it tantamount to comparing apples and oranges.

Mr. Borchert stated his belief in Professor Sandman's view that the public must be involved in making decisions. He cited the situation with siting LLW disposal facilities in Illinois, California, and Nebraska as examples that "selling" is not working. He then stressed the need to do something different in the process -- e.g., start talking about health assessments or educating people. He again mentioned a science teachers' workshop conducted by one of Nebraska's universities, in which high school teachers discussed radon issues for two days. Partly in response to earlier questions about how much testing will satisfy the people, Mr. Borchert said there is a great deal of resistance to full scale testing but it is an issue that must be addressed.

Mr. MacDonald warned that full scale testing would not blow away public opposition. He suspected Peter Sandman would have said there also needs to be a system of accountability -- people want to be in control. Mr. MacDonald stressed the importance of looking at whether or not a question is reasonable to ask -- in other words, is there anything to learn and, if so, is it worth the price? He said he believed not every question needs an answer.

Mr. Borchert asked the committee members if they would like to think about the matter of full scale testing and wait until Ms. Sattler contacted them before discussing the issue. Mr. McCabe mentioned, by the way of background, that the committee had gone on record in the past in favor of full scale cask testing. One of the reason the committee did so was that some of the legislative members were of the opinion that even if new technical data is not generated, such testing would be valuable from a public confidence perspective. Mr. Sanders said full scale testing would certainly yield new technical data; the question is whether it is technically *necessary* to get the information.

Mr. Flater asked what exactly is meant by full scale testing. He expressed concern over having to conduct repeated tests in the event something goes wrong with the first one. He wondered when someone would stand back and say "enough is enough." Mr. Flater said as regulators, the committee members had to take a stand and do something. He said he wanted answers to questions regarding the type of testing, how to select the casks, what is an acceptable risk, etc. Mr. Borchert said when these questions are answered, experts need to be able to articulate this information to the public.

Mr. Flater said he knew he would be as concerned as the people of Nevada if the repository were going to be built in Iowa. Someone pointed out that a great deal of the waste will be travelling on I-80 in Iowa. Mr. Flater said he was aware of this, but that so far the citizens in Iowa were not overly excited about the shipments. Thirty-four trains had gone across the lower part of the state without incident. Mr. Borchert said he saw the shipments mentioned on the news only once or twice. Mr. Flater said the state of Illinois had wanted to check the train when it crossed the bridge in Burlington to make sure it was not contaminated. Mr. Baer commented that one problem with getting the public involved is expecting the public to be capable of making analytical decisions when newspapers, for instance, are written at the level of 8th grade readers. He stressed the importance of having professionals make the decisions regarding criteria for testing and communicate the information to the public.

Mr. Halstead commented on some social science research conducted by the New Mexico Public Affairs Institute. The institute used both surveys and focus groups to try to get a handle on what people think are important factors to include in a transportation program in order to address their concerns over risks. Mr. Halstead noted that factors such as driver training and certification appear to be important.

With regard to the issue of credibility, Mr. Halstead commented that according to the surveys conducted by the state of Nevada, government engineers scored lower in terms of public confidence than university engineers. Someone asked what level of confidence people showed in utilities. Mr. Halstead said there are no nuclear utilities in Nevada. Mr. Vincent said, as a result of owning Three Mile Island, GPU had absolutely no credibility in the late 1970s. Now the situation is different, however. Mr. Baer pointed out that TMI Unit 1 is one of the best operating units in the country, and that the entire state of Pennsylvania has a good record for operation of nuclear reactors.

Ms. Gilham asked Ms. Hiatt if she would like to comment on the proceedings, since she represents a public citizens group. Ms. Hiatt commented that part of the hostility toward the government is fueled by the fact that the public is powerless. She feels the best remedy is to give the public some power over decisions. She recognizes the difficulty inherent in this approach, especially in working with people who are not familiar with technical issues. She noted, though, that if people feel they have no say in the matter, there will be a great deal more distrust and hostility than if they are involved in making the decisions. She also pointed out that she was aware there are certain radical groups whose purpose is to foment skepticism, distrust, and hostility towards the government. She warned that these people are probably not going to be reached by any public education or involvement program. She also said the trick would be to reach the mainstream people who have not already been brainwashed before the radicals reach them.

Someone asked Ms. Hiatt how she felt about what she had been hearing at this meeting. She said her impression was that this was a very useful, honest, and open meeting and discussion of the issues. She warned that her perspective is probably not typical of that of the general public, because she has been working on this issue for 12 years with NRC and other elements of state government.

Ms. Sattler announced she would be showing *Operation Smash Hit* if anyone was interested. She then adjourned the meeting around 4:00 p.m.