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ACNW-0126

**MINUTES OF THE 105TH ACNW MEETING
DECEMBER 15-17, 1998**

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By B. John Garrick
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**CERTIFIED MINUTES OF THE 105TH MEETING OF THE
ADVISORY COMMITTEE ON NUCLEAR WASTE
DECEMBER 15-17, 1998
Rockville, Maryland**

The U.S. Nuclear Regulatory Commission (NRC) Advisory Committee on Nuclear Waste (ACNW) held its 105th meeting December 15-17, 1998, at Two White Flint North, Room T-2B3, 11545 Rockville Pike, Rockville, Maryland. The purpose of this meeting was to provide a forum for attendees to discuss and take appropriate action on the items listed in the agenda (Appendix II). The entire meeting was open to public attendance.

A transcript of selected portions of the meeting is available in the NRC's Public Document Room at the Gelman Building, 2120 L Street, NW, Washington, DC 20555. Copies of the transcript are available for purchase from Ann Riley & Associates, Ltd., 1250 I Street, NW, Suite 300, Washington, DC 20005. Transcripts are also available for downloading from, or reviewing on, the Internet at <http://www.nrc.gov/ACRSACNW>.

ATTENDEES

ACNW members who attended this meeting included Dr. B. John Garrick, ACNW Chairman, Dr. Charles Fairhurst, Dr. Raymond G. Wymer, and Dr. George M. Hornberger. For a list of other attendees, see Appendix III.

1. CHAIRMAN'S REPORT (Open)

[Mr. Richard Major was the Designated Federal Official for this portion of the meeting.]

Dr. B. John Garrick convened the meeting at 8:35 a.m. and explained the purpose of this session. He noted the following items he believed to be of interest:

- A. Chairman Jackson has accepted a position as the 18th president of Rensselaer Polytechnic Institute. Her term as president will begin following completion of her term as Chairman of the NRC in June 1999.
- B. Frank Miraglia, current Deputy Director, Office of Nuclear Reactor Regulation (NRR), will succeed retiring Hugh Thompson as Deputy Executive Director for Regulatory Programs.
- C. Malcolm Knapp, previously Deputy Director, Office of Nuclear Material Safety and Safeguards (NMSS), has become Deputy Executive Director of Regulatory Effectiveness. This position has been vacant since William Travers became Executive Director for Operations on October 19, 1998.

- D. Martin Virgilio will succeed Dr. Knapp as the new Deputy Director of NMSS effective December 14, 1998. Mr. Virgilio had been Executive Assistant and Director of the Office of the Chairman since March 1997. He also served as a Deputy Division Director in the Office of Nuclear Reactor Regulation (NRR).
- E. Michael Weber, now Deputy Director, Division of Waste Management (DWM), NMSS, will replace Mr. Virgilio on Chairman Jackson's staff.
- F. Chairman Jackson also announced the retirement of Carlton Stoiber, Director, Office of International Programs, since April 1993; his successor has not yet been named.

II. MEETING WITH THE JOHN GREEVES, NRC'S DIRECTOR, DIVISION OF WASTE MANAGEMENT, OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS (NMSS) (OPEN)

[Richard Major was the Designated Federal Official for this portion of the meeting.]

John Greeves, Director of the Division of Waste Management (DWM), Office of Nuclear Material Safety and Safeguards (NMSS), accompanied by Martin J. Virgilio the new Deputy Director of NMSS, after noting several recent management changes in his division, discussed the current activities of the Department of Energy (DOE) and NRC relative to Yucca Mountain. He also commented on recent developments that could affect several low-level waste (LLW) disposal sites (i.e., Barnwell and Envirocare). Mr. Greeves discussed various aspects of decisions related to the shipment of the Trojan reactor pressure vessel and noted the forthcoming Commission briefing on decommissioning criteria for the West Valley site in western New York State. He also described the activities of the Decommissioning Management Board and the potential clearance rule. He closed his comments by noting the following areas that he believed the Committee could contribute to during the forthcoming year:

- (1) Evaluating the forthcoming EPA standard for Yucca Mountain (40 CFR Part 197)
- (2) Finalizing the NRC's proposed rule for Yucca Mountain (10 CFR Part 63)
- (3) Resolving the Key Technical Issues (KTIs)
- (4) Reviewing of and commenting on the DOE Viability Assessment (VA) for Yucca Mountain
- (5) Reviewing of and commenting on DOE's draft license application
- (6) Reviewing, from a preclosure issue perspective, the Yucca Mountain review plan and performance assessment (PA)
- (7) Reviewing of and commenting on the Yucca Mountain draft Environmental Impact Statement (DEIS) [due to be issued in Fiscal Year (FY) 2000]
- (8) Reviewing the Waste Confidence Options paper

Mr. Greeves closed by responding to several questions related to the Yucca Mountain project [PA, VA, engineered barrier system (EBS)], DEIS, Issue Resolution Status Reports (IRSRs), etc.] and indicated that he, along with several members of his staff, would attend the February meeting of the ACNW, at which time they would present their views on DOE's VA.

III. OVERVIEW OF FY 1999 NRC STAFF PROGRAMS (Open)

[Howard Larson was the Designated Federal Official for this portion of the meeting.]

Representatives from NMSS, NRR, and the Spent Fuel Project Office (SFPO) presented an overview of the following four Fiscal Year (FY) 1999 programs: the high-level waste (HLW) repository program, the NMSS and NRR decommissioning programs, and the proposed activities for the Spent Fuel Program Office.

Michael Bell, Branch Chief in DWM, NMSS, presented the related FY 1998 accomplishments and FY 1999 goals and measures. He particularly noted that in regards to the KTIs for the HLW repository, during FY 1999 the target for DWM is to resolve five subissues: (1) rate of shallow infiltration, (2) rate of deep percolation, (3) physical and chemical systems affecting radionuclide transport, (4) consequences of igneous activity, and (5) design for seismic events and fault disruption.

Dr. Bell reviewed the major schedule milestones for the HLW repository, KTI priorities, and resource requirements and closed his presentation with the following list of proposed future ACNW interactions with the DWM HLW program staff:

- (1) review of the DOE Viability Assessment (VA) document (February-March 1999)
- (2) evaluation of public comments on the proposed HLW implementing rule (10 CFR Part 63). Scheduled for May 1999
- (3) update on the most recent Issue Resolution Status Reports
- (4) report on the status of the importance analysis/total system performance assessment code post-processor effort
- (5) NRC staff comments on the proposed Environmental Protection Agency (EPA) Yucca Mountain Standard (10 CFR Part 197) and on DOE's Draft Environmental Impact Statement (tentative)

The Committee noted that with the limited number of ACNW meetings available in FY 1999, there is a need to have a plan to ensure that these discussions are scheduled in such a way that Committee advice is provided in a timely manner. The NRC staff and the ACNW will work together to accomplish this objective.

John Hickey, Branch Chief in DWM, NMSS, discussed the NRC materials facilities decommissioning program. He noted that of the 5800 fuel cycle and materials facilities, while each year there are several hundred routine license terminations, there are also several rather lengthy and complex decommissionings, e.g., the West Valley Demonstration Project and the 36 sites covered by the Site Decommissioning Management Plan (SDMP). After briefly reviewing the background of the NRC decommissioning program from 1988 to present and after summarizing the eight steps in the decommissioning process leading up to license termination, Mr. Hickey outlined the NMSS responsibilities at both materials and reactor facilities. Of particular note is the fact that NMSS assumes responsibility for reactor facility regulatory oversight and project management after the spent fuel is permanently transferred from the spent fuel pool.

Mr. Hickey then described the functions of the recently established Decommissioning Board and presented staff activities with regard to the development of decommissioning and license termination guidance and criteria. He indicated that included among the principal activities planned for FY 1999 are the removal of three sites from the SDMP, the initiation of clearance rulemaking activities, the continuance of the decommissioning pilot program at five volunteer materials facilities, the continuing involvement in the West Valley Demonstration Project, and continued support to the Interagency Steering Committee on Radiation Standards.

Mr. Hickey noted the following topics proposed for future staff interactions with the Committee:

- (1) development of the License Termination Rule
 - briefing on issues requiring resolution
 - review and comment on the drafts of several SRP modules
- (2) review of and comment on a proposed "clearance" rule
- (3) proposed staff decontamination and decommissioning (D&D) process improvements

A Committee Member suggested that the current debate between the Environmental Protection Agency (EPA) and the NRC regarding the acceptability of a 15-mrem (with a concurrent 4-mrem groundwater protection value) vis-a-vis the NRC 25-mrem all-pathways standard be quickly resolved.

After introductory comments by Michael Masnick, the following presentations were given:

- (1) An overview and brief history of reactor decommissioning (Ron Burrows, Project Manager, NRR)

- (2) A discussion of the current reactor decommissioning process (Michael Webb, Project Manager, NMSS)
- (3) License termination plan requirements and process to be followed insofar as the termination of reactor licenses (Clayton Pittiglio, Project Manager, NMSS)
- (4) An updated report on the status of nuclear power reactor decommissionings (Phillip Ray, Project Manager, NRR)
- (5) A listing of guidance and process improvements planned for the next several years (Richard Dudley, Sr. Project Manager, NRR)

In response to a question from Dr. Garrick as to the most challenging issues faced by NRR with regard to reactor facility decommissioning, it was stated that the development of the process represents the major challenge in that the regulations were not initially written to most efficiently accommodate the task of decommissioning.

The Committee indicated an interest in receiving a listing and tentative schedule of items for which NRR desired ACNW review and comments, and/or concurrence.

Susan Shankman, Deputy Director, SFPO, NMSS, presented the SFPO's approach to licensing reviews. She gave a brief history of the creation of the SFPO and discussed, in general, its responsibilities. She graphically presented the current status of the nuclear power industry's spent fuel storage problem, noting that there were 12 operating Independent Spent Fuel Storage Installations (ISFSIs) and approximately 20 more sites with potential, near-term, ISFSIs. She also noted that the current SFPO workload consisted of some 20 cases.

In order to effectively deal with such a workload, the SFPO inserted both discipline and improvements into the review process, making it more stable and predictable. Ms. Shankman noted that in the past 6 months—the period for which these changes have been in effect—the SFPO has never failed to meet a schedule.

Ms. Shankman noted six rulemaking initiatives currently in process which are intended to modify 10 CFR Part 72 in such a manner as to reduce the regulatory burden. She closed this part of her presentation with a listing of some of the many accomplishments of the SFPO during 1998.

She then reviewed the status of the application by Portland General Electric to ship, in one piece, the Trojan reactor pressure vessel (RPV) from the reactor site down the Columbia River across a section of the Hanford site to the U.S. Ecology disposal facility.

She noted that the agency had several "lessons learned" from participating in this shipment, e.g.:

- (1) The exemption approval decision should be risk informed.
- (2) Current regulations do not specifically address large components—guidance is needed.
- (3) Engage others in the process early and often (including stakeholders and the public).
- (4) There is no definition of acceptable level for risk-informed decisions in transportation.

Dr. Garrick observed that the evaluation of a lesser risk from the accepted mode of shipment of the Trojan RPV would seem to perhaps apply to many other RPV shipments during a reactor decontamination and decommissioning. Ms. Shankman stated that, where possible, SFPO would attempt to reach a similar conclusion, but noted that one of the major inputs in making such a decision final is the willingness of the disposal site to accept such a package.

She noted that at this time the SFPO did not foresee any topics that it had planned for FY 1999 as requiring ACNW review.

IV. COMPARISON OF DandD AND RESRAD COMPUTER CODES USED IN DECOMMISSIONING ANALYSIS

[Mr. Howard Larson was the Designated Federal Official for this part of the meeting.]

Ms. Cheryl Trottier, RES, presented the initial results of the DandD and RESRAD models comparison currently underway. Following her presentation, Mr. Ralph Cady, RES, provided a status report on the Sandia Environmental Decision Support System (SEDSS).

Ms. Trottier noted that the purpose of the comparison of the two codes was to provide information regarding the differences and similarities between the models, *not* to determine which model is better. The results of the comparison will be used to provide guidance (in applicable regulatory guides and standard review plans) regarding what model attributes are important for specific site conditions. She discussed the six tasks established for the comparison and then presented the results thus far (which were noted as being available on the Web).

The models are to be evaluated over the next 2 years. At the conclusion of the evaluation period a decision may be made as to whether to continue to have two models. The DandD code was intended to be used for screening, it being believed that such a code could be of use to licensees by minimizing the amount of additional information required. Ms. Trottier stated that one of the reasons for embarking on the development of the DandD code was to develop a code that specifically met NRC's needs.

Committee Members questioned whether the applicability of DandD would be wide-spread, or whether it would only be useful at a limited number of sites. It was noted, in response, that there will probably be more sites that require a site-specific code and that the number of sites that would pass a DandD screening may be fairly small. One of the desired outcomes of the public workshops is to verify this assumption.

Dr. R. Abu-Eid, NMSS, stated that currently the screening default table has only been developed for beta and gamma emitters. A default value table for alpha emitters is still under development.

Mr. Cady stated that the goal of the SEDSS project is to provide a flexible framework for integrating a general collection of discipline-specific computer codes. Such a framework could enable the staff to perform appropriate stochastic analyses of D&D or LLW problems. He noted that the SEDSS concept could be particularly valuable when using complex codes. Since its inception, SEDSS has been supported by EPA and DOE, as well as by the NRC. However, thus far this year, these two agencies have failed to provide financial support, thereby jeopardizing the continuance of SEDSS development. The NRC staff intends to meet with DOE and EPA in the near future to explore needs, expectations, and support for SEDSS, given the current budgetary constraints. Both the NRC and EPA desire that SEDSS be enhanced by the inclusion of multidimensional ground-water flow and the NRC is investigating the feasibility of enhancements to support simulation of mechanistic-sorption processes.

The Committee thanked both speakers, noting its intention to follow the results of the DandD/RESRAD code model comparisons, particularly as they apply to the development of staff documents for both internal and licensee guidance. Dr. Garrick also stated an interest in hearing about the ultimate resolution, and potential utility, of the SEDSS effort.

V. DEPARTMENT OF ENERGY'S TOTAL SYSTEMS PERFORMANCE ASSESSMENT

[Dr. Andrew Campbell was the Designated Federal Official for this part of the meeting.]

Repository Safety Strategy

The first speaker was Jack Bailey, Director, Regulatory and Licensing, for DOE's management and operating (M&O) contractor who provided an overview of Revision 2 to DOE's Repository Safety Strategy (RSS). He discussed attributes of system performance, the postclosure safety case, and the role of the RSS in the site recommendations (SR) and the license application (LA). The RSS constitutes DOE's plan for completing the postclosure safety case by providing a framework for organizing and integrating site, design, and performance assessment information.

He described how the RSS evolved because of new site information and insights from Total System Performance Assessment (TSPA) analyses. He described the current version in terms of four key attributes of natural and engineered system performance:

- (1) limited water contacting the waste packages (WPs)
- (2) long waste package lifetimes
- (3) slow rates of radionuclide release
- (4) concentration reduction of radionuclides during transport

In Revision 2 of the RSS, 19 principal factors are used to identify information needed for the postclosure safety case. Mr. Bailey discussed the RSS evolution using the seepage issue as an example. He said that the bases of the RSS are that most radionuclides are not mobile, that water will transport a few radionuclides, that natural features limit water movement, and that the site is a predictable, stable environment. The elements of the safety case include the postclosure assessment, design margin and defense in depth (DID), disruptive processes, insights from analogs, and the performance confirmation plan.

Mr. Bailey discussed the DOE contractor's systematic evaluation of the principal factors so that they can understand required performance, identify those principal factors that affect system performance, and conduct sensitivity studies and uncertainty analyses. He described how the 19 principal factors correspond to the four RSS attributes. The first key attribute of the RSS (limited water contacting waste packages) is addressed by six of the 19 principal factors (all having to do with water getting to the waste package). The second key attribute of the RSS (long waste package lifetime) is addressed by three of the principal factors (chemistry on the WP, inner and outer barrier integrity). The third key attribute (low release rates from breached WPs) corresponds to six principal factors (seepage into the WP, cladding integrity, dissolution, solubility of neptunium, formation of colloids, and transport) out of the WP. The fourth key attribute (reducing radionuclide concentrations during transport) is addressed by the principal factors dealing with transport in the unsaturated zone (UZ) and saturated zone (SZ), dilution at the pumping well, and "biosphere dilution." He discussed the significance of uncertainty for each principal factor and DOE's evaluation of numerical values of high, medium or low impacts to assign priorities for the 19 factors. Dr. Garrick asked if this was done at different time frames? Mr. Bailey replied that the approach is to evaluate the factors at three different time frames—10,000, 100,000 and 1,000,000 years. Mr. Bailey discussed potential design options, such as backfill, drip shields, and ceramic coatings and described how they evaluated the impact of these options on seepage importance. He showed results from three performance assessment (PA) cases: the base case, drip shields, and ceramic coatings.

Mr. Bailey said that the postclosure safety case will include expected repository performance, provide for margin and DID, consider disruptive processes, incorporate analog information and contain a performance confirmation plan. He said that the major focus of the LA will be the postclosure safety case because most radionuclides decay or are immobile. Safety issues concern evaluation of the mobile radionuclides. Mr. Bailey said that postclosure safety case will be complete when the remaining uncertainties are mitigated through design options. He added that the remaining work (prior to submission of the LA) focuses on the highest priority items. They will update the TSPA models using improved process models and design alternatives. He

described how they will address design margin to deal with variability in material properties. They will use DID to identify barriers important to the safety case and their contribution to performance. Disruptive processes will be addressed by updating the analyses and completing documentation of volcanism, seismic hazard, and human intrusion. They will also conduct more work on the consequences of postclosure nuclear criticality. In the area of natural and man-made analogs they will compile and review information on solubility, colloids, retardation, infiltration, and materials behavior. The performance confirmation plan will take into account the design for LA and specify monitoring, testing, and analyses needed to address uncertainties. In summary, he briefly described how they will evaluate system importance and importance of uncertainties for each component or subsystem for the SR and LA. He noted that changes in design will affect the importance or sensitivity of the different principal factors.

Questions:

Chairman Garrick noted the topdown view of the four key attributes and asked if they are able to quantify the role of each attribute, and what measures they use to determine which are more important. There was a discussion of the changes in the focus of the HLW program and whether the engineered system was now getting more focus than the natural system. Mr. Bailey discussed some of the changes but said he didn't believe one was getting more attention than the other. He also discussed some of the changes to the RSS in the last 5 years. In answer to a question from Dr. Wymer, he said that the performance period may stretch to 300 years and that a conventional approach (e.g., design basis events, worker safety, stability) will be used for the preclosure safety case. Dr. Fairhurst noted that the three main barriers are the engineered system, the geologic system, and the biosphere. He inquired about strategies to deal with the biosphere. Mr. Bailey replied that the Environmental Protection Agency (EPA) is in charge of developing a standard and that there are several approaches to dealing with the biosphere. DOE chose a particular approach for the VA, but the regulators (EPA and NRC) will be specifying the approach for LA. Dr. Steindler asked about the limitations of an iterative approach for evaluating different design alternatives. Mr. Bailey said that an alternative design based upon analysis with a flawed tool would not be acceptable, but that one must recognize that the tool may not be perfect and so they need to be aware of the limitations. Chairman Garrick asked about the basis of the 19 factors. Mr. Bailey said that they used an iterative, 2-week session to identify processes that impact the movement of a drop of water through the mountain, mobilization of radionuclides, and transport to the critical group. Chairman Garrick asked about mapping of principal factors to KTIs, the role of the IRSRs, and if there are any holes? Mr. Bailey said that they have done this mapping and there are some differences. He added that the IRSRs are a fine piece of work because they point out what NRC thinks is important and DOE uses them a great deal to help focus its work. Chairman Garrick noted the variability and size of the whole repository and asked about the representation of different areas using a mechanistic degradation model. Mr. Bailey replied that DOE is representing different regions of the repository with associated natural characteristics in their model. Drs. Wymer and Hornberger asked about the hypothesis that the water table may rise up to the level of the waste

and whether DOE's work on disruptive events includes work on the issue of hydrothermal fluids potentially intruding into the waste. Mr. Bailey said that they are planning some work in this area. Dr. Fairhurst raised issues concerning humidity in the repository and the degradation of the WPs. Dr. Holly Dockery replied that humidity is a concern for the corrosion allowance material, but not an issue for alloy-22. She added that the alloy-22 degradation rate is one of the top two issues identified in sensitivity studies. Dr. Campbell asked about conceptual model uncertainty and how DOE deals with the analysis of alternative conceptual models (e.g., the hydrothermal fluids hypothesis). Mr. Bailey said that they currently screen out features events and processes that they do not think are important. The analysis of alternative models could be done separately to determine if they are important from a defense in depth perspective.

Total System Performance Assessment (TSPA) Overview

Dr. Abe Van Luik, Senior Technical Advisor, Performance Assessment, DOE Yucca Mountain Site Characterization Office, discussed the major features of the repository system that are evaluated by TSPA-VA, including climate, infiltration, UZ flow, seepage into the drifts, the thermohydrologic environment, near-field geochemical environment, waste package (WP) degradation, cladding and waste form degradation, mobilization and engineered barrier system (EBS) transport, UZ transport, saturated zone SZ transport and dilution, and biosphere transport. He described the relationship between these model components, the four attributes and 19 principal factors of the RSS, and the NRC's ten KTIs. He discussed improvements that they are making in the climate models. One change is that the unrealistic "superpluvials" in their VA model will be replaced with a long-term average climate that is more variable.

Dr. Van Luik discussed the results in terms of the deterministic base case, the probabilistic base case, and comparative analyses. He said that DOE's deterministic analysis ("expected-value case") uses a single, mean input value for each parameter. The deterministic base case is not used for regulatory compliance but to illustrate repository performance. Evaluation of the output from a probabilistic treatment of the model input parameters is done as part of their probabilistic base case. Dr. Van Luik discussed the results for the deterministic base case. He said that DOE assumes that a single juvenile failure (out of more than ~7,000 WPs) and 14-17 corrosion failures occur in the first 10,000 years. Dr. Campbell asked if the single juvenile failure was a representation rather than an actual estimate. Dr. Van Luik said that they had estimated between 0 and 10 juvenile failures with a mean near 1.

Dr. Van Luik said that an increase in infiltration at 5,000 years to long-term average values leads to a higher water flux with more WPs failing due to corrosion, and generates the doses for the 10,000 year period. In the first 10,000 years technetium-99 is a key radionuclide because of its mobility (high solubility and low sorption). He described the approach for modeling WP failure and release from failed patches by advective and diffusive water flow. He discussed how different regions of the repository are modeled and noted that region five has the highest water flux and the largest releases of the six regions. He discussed the modeling approach for the

unsaturated and saturated zones. He also discussed different "breakthrough" times for the three different climate regimes modeled. In answer to a question from Dr. Hornberger, Dr. Van Luik said that in the SZ sensitivity studies the breakthrough times are based on a constant source at the UZ/SZ interface. In answer to a question from Dr. Garrick, Dr. Van Luik also discussed development of a more sophisticated SZ model based on more realistic approaches and data for the SR/LA. He noted that the conservative parameters in the DOE's current model include 20 meters per year water flow rates in the SZ and a dilution factor of 2.

Dr. Van Luik then discussed the probabilistic case that was developed using Monte Carlo analysis. He displayed "horsetail" diagrams showing the dose rate time histories for dozens of different "realizations" of the data. From these compilations DOE extracted the mean, median, and 95th and 5th percentiles of the curves to be consistent with NRC's methodology proposed in the draft 10 CFR Part 63 (Yucca Mountain) regulation. He noted that the mean doses change at different time frames (0.1 mrem/year at 10,000 years, 30 mrem/year at 100,000 years, and 200 mrem/year at 1,000,000 years). He added that the NRC chose the mean as the basis for compliance. Dr. Garrick asked if the issue is really contamination of the groundwater and biosphere rather than dose, since interdiction is an option for dose but more difficult for groundwater or the biosphere. Dr. Van Luik said that the contaminant ranges are within accepted values. The issue is what is the impact on the environment, but this is usually addressed in terms of dose by the NRC. He added that for EPA the issue is groundwater protection, but expressed concerns on how it may be implemented. He also said that groundwater contamination issues will be addressed in the environmental impact statement. Dr. Campbell asked about the particular mix of radionuclides contributing to dose in DOE's results and differences with NRC's results. Dr. Van Luik said that there are some differences because the two models use different parameter values.

Dr. Van Luik described the dominant radionuclides contributing to dose in the different time periods. For the 10,000-year period, technetium-99 dominates the dose, iodine-129 is next, carbon-14 contributes a very small amount, and others are negligible. In the 100,000 year period, neptunium-237 and technetium-99 are the two key radionuclides (with some contribution from iodine-129). In the 1,000,000-year period, neptunium-237 is the dominant radionuclide. Neptunium solubility is significantly higher in the model treatment than other actinides, such as Pu, which do not show up until very long time frames. Also, neptunium sorption is relatively low compared to other actinides.

Dr. Van Luik also discussed the impact of disruptive events as the third element of the postclosure safety case. The events considered include igneous activity, seismic activity, nuclear criticality, and human intrusion as the third element of the postclosure safety case. In DOE's analysis of igneous activity 5% of the realizations of an igneous intrusion into the repository caused direct release of radionuclides and 10% had the appropriate wind direction to cause doses in the Amargossa Valley. They also looked at an enhanced source term and the impacts on the groundwater path caused by magma intrusion into the repository. Dr. Roland

Barnard (Sandia National Laboratory) said that there are two time frames of concern, the initial hot period of the intrusion and the period after cooling of the magma. In the latter it is assumed that water returns to the system, resulting in enhanced WP corrosion and an altered source term for affected WPs. In the area of seismic activity, DOE's model calculates the number of WPs failed from rockfall over time and compares failures due to corrosion and rockfall to the total. They conclude that rockfall is a small effect on total cumulative probability. In the area of criticality, Dr. Van Luik said that there is a small effect for a single WP going critical. He noted that K-effective reaches a maximum before most WPs fail due to corrosion. Dr. Garrick asked if this was due to assumptions about geometry. Dr. Barnard said no, that decay changes the mix of nuclides after 100,000 years, decreasing the reactivity by 30%, so the likelihood of criticality decreases with time. Dr. Van Luik discussed DOE's analysis of the consequences of human intrusion at 10,000 years. Finally, he said that in their analyses 80% of the time the water table is raised 80 meters relative to the current climate but that they had not addressed the Szmansky hypothesis because they believe it is incredible.

Questions:

Dr. Steindler noted that the draft Part 63 regulation specifies 100 years after closure for the intrusion analysis and asked what the effect would be on DOE's analysis? Dr. Van Luik said that they have not really looked at this. He added that it is very unlikely that a drill bit used for Yucca Mountain rock would penetrate a WP at 100 years. Dr. Wymer asked if they looked at concentration processes for uranium and plutonium for the criticality analysis? Dr. Barnard discussed the analyses they did for criticality both inside the WP and outside it. Dr. Hornberger noted the imperfect database and asked how realistic is the analysis? Dr. Van Luik replied that an expert elicitation showed that because of uncertainties in the near field there is much uncertainty in the degradation rate of alloy-22. He said that this will be addressed in the database testing program to confirm the range of values in the analysis. One of the challenges, he added, is to have a firmer design for LA. Uncertainty will still be great by the time of construction authorization, but it will come down by the time of the amendment to begin putting waste in the repository.

Comparative Analysis to Determine Sensitivity of Uncertainty for Principal Factors

Dr. Holly Dockery presented the analysis of TSPA results to determine the most important uncertain parameters in the model. They conducted probabilistic and deterministic analyses using both a multiparameter regression approach and one-off sensitivity analyses. She added that heterogeneity and uncertainty are addressed in base case and comparative analyses. They looked at the main contributors to variance at different time periods. The sensitivity studies reported show that at all time frames (10,000, 100,000, and 1,000,000 years) seepage shows the highest correlation with dose. At very early time frames (<10,000 years), when only a few WPs are corroded, the most important uncertain variables (in addition to seepage) are the alloy-22 corrosion rate, the number of juvenile failures, and the saturated zone dilution factor. In the

100,000 year time frame, the next most important uncertainties (after seepage) are the corrosion rate and the variability in corrosion rate, and finally the number of juvenile failures. In the 1,000,000 year time frame the most important uncertain parameters are (in addition to seepage) saturated zone dilution factor, dose conversion factor for neptunium-237, and the alloy-22 corrosion rate. Because neptunium is solubility limited, the release rate is determined by the seepage rate of water into the WP. In a "modified parameter case" seepage and WP corrosion were set to their mean input values (and thus removed as variables from the sensitivity analysis). The most "important" variable parameters thus identified are SZ dilution, corrosion failures of the cladding, biosphere dose conversion factors (BDCFs), longitudinal dispersion in the saturated zone, mechanical failures of the cladding, and the fraction of alluvium in the SZ (due to sorption of neptunium in the alluvium). Dr. Dockery also discussed the benefits and limitations of regression analysis.

Dr. Dockery described a series of single value (one-off) sensitivity studies of the principal factors that showed up in the multiple regression analyses. This allowed them to evaluate uncertainty not captured in the probability distributions. They held all parameter values at the mean except one parameter. She discussed the one-off sensitivity studies for infiltration. Dr. Hornberger commented that the threefold increase in infiltration that they used is not linearly related to the percolation to the repository. Dr. Dockery said that they looked at fracture permeability and fracture aperture ranges and noted that the latter had the most effect on dose. An increased aperture results in a decreased release due to movement of contaminated water through the matrix. Dr. Van Luik discussed the range of infiltration values and the impact on seepage. Dr. Dockery discussed the results of varying the alloy-22 degradation rate. This produced a wide range in dose due to variations in the number of WPs failed. They also evaluated cladding degradation by varying the uncertainty 1-50 times. They also considered complete failure of the cladding at time zero and at 100,000 years. The result showed a 50-fold increase in dose if all the cladding is failed at early times. Dr. Hornberger commented that this indicates cladding is very important to preclude high doses in the analyses. Dr. Dockery said that the effect of varying neptunium solubility was about a 10-fold increase in the range of doses at 100,000 years. She discussed the saturated zone model and noted that there is not a lot of use in looking at the current stream-tube model when the later model will be much more complex. There was not a large effect on dose due to the narrow dilution range in the model. Dr. Dockery also discussed the benefits and limits of the one-off approach. She described the design option analyses that looked at the impacts of three options, backfill, drip shields, and ceramic coating. In summary she said the most significant factors affecting performance are the degradation of the waste package and the seepage into the drifts. She added that an unsaturated zone workshop in Albuquerque was looking at the drips and seepage issue.

Questions:

Dr. Garrick asked about design enhancements and modeling to support the choices. He also raised the issue of modifying the modeling structures to allow importance ranking and scenario analyses. Dr. Dockery said that a huge suite of alternatives is being run through the TSPA analyses. She added that they used some of the same analyses methods that were used for the Waste Isolation Pilot Plant (WIPP) PA. They will also present later in the meeting another method to look at individual contributors to performance. Dr. Steindler said that TSPA-VA is really a mix of bounding analysis and values as well as realistic cases. He asked what areas might change significantly in the next version of TSPA? Dr. Dockery said the next TSPA in April of 2000 would not have large changes. One area of change will be in handling uncertainty in the seepage model (e.g., how to calculate the way water gets into the WP) and the other will be in the saturated zone flow and transport model. Dr. Van Luik said that the RIP platform was selected because of built-in features that allow uncertainty analyses. He added that TSPA-VA has taught them much about what they need to do to have a more robust TSPA to go into LA. The water flux model is thought by some to be unrealistically conservative, but the licensing case cannot be completely realistic. Chairman Garrick and Dr. Dockery discussed conservative vs. realistic modeling issues, the use of mean values in parameter distributions, the transparency of results and supporting evidence, model improvements, and the sparsity of data points. Dr. Dockery also stated that they had learned much about the PA process and used the WIPP PA methods liberally.

Prioritization of Technical Work to Complete the Postclosure Safety Case:

Dr. Ernie Hardin (M&O) discussed the prioritization of technical work planned to be done before LA. He discussed the status of the five elements of the postclosure safety case: performance and evidence, design margin and DID, disruptive processes, insights from analogs, and performance confirmation. He discussed the approach and methods used to develop the priorities. The prioritization process assessed significance, current confidence, and the confidence goal for each of the 19 principal factors. They have taken the 19 principal factors and determined their significance to quantifying TSPA modeling uncertainties. Each factor is assigned a low, medium or high significance rating at three different time frames. He defined the "current confidence" as the degree of certainty that the current representation of a principal factor is "realistic" and captures the range of conditions important to performance. In the process they numerically assigned a current confidence value to each principal factor (from 1 to 7). Dr. Steindler asked about the models used to do iterative design changes? Dr. Hardin described the approach and models used. He said that the determination of "confidence" is based on "expert judgment". DOE also established a confidence goal for each factor. He defined the confidence goal as the level of confidence that is both feasible and desirable at the time of LA. Finally, they assigned a priority of work to address the uncertainties in the current "estimates." The three top priorities are seepage into drifts, integrity of corrosion-resistant WP barrier, and transport through the unsaturated zone. He provided details on the technical work

in these three areas. The next level of priorities is percolation, heat and excavation effects on flow, dripping on waste packages, chemistry on waste packages, cladding failure, and colloids. In summary, he said that the technical work needed for SR and LA has been identified using prioritization. They have implemented the prioritization in the DOE program plan. The prioritization considers postclosure performance and things such as cost and schedule, and they have applied their judgment in the use of the TSPA model. They think that prioritization is absolutely essential to focus the technical part of the program on needs for SR and LA. They also recognize that some technical work will continue beyond the LA as part of the performance confirmation program. The prioritization exercise is the successor to a couple other activities conducted since the 1989 Site Characterization Plan.

Questions:

Dr. Steindler asked about the chemical environment for neptunium. Dr. Hardin discussed some of the Eh values measured in older boreholes and noted an effect on neptunium but not on technetium chemistry. Dr. Steindler noted that the prioritization is done in part on the basis of cost and schedule, but the Atomic Safety and Licensing Board may be concerned with the necessity of having values based on technical need. Dr. Hardin said that they recognize there may be a need for more work in a specific area, but it may not be feasible. Dr. Fairhurst asked how much new data will be in the LA? Dr. Hardin said that some new data may not be in the draft SR/LA. Dr. Fairhurst asked about the effect of tunnel collapse, the stability of large voids, the impact on water flux calculations over long times, and the effect of the thermal pulse. Dr. Hardin discussed the single-heater test in the lower lithophysal strata at Yucca Mountain and said that they think the cooldown event will capture system response.

Dr. Wymer asked about secondary precipitation effects on neptunium solubility; effects on technetium mobility; whether radionuclides migrate to higher temperature regions; and the thermal effects on complex stability and redox chemistry. Dr. Hardin said that conditions in the WP are interesting but it is difficult to predict redox chemistry conditions. Dr. Garrick asked what they would do if they were not schedule driven? Dr. Hardin said that they would drill more boreholes in SZ and do more thermohydrology studies. Dr. Hornberger asked whether DOE would do anything different or just more of what they are currently doing. Dr. Hardin replied that is a valid observation. Dr. Campbell asked about the evaluation of backfill. Drs. Dockery, Hardin, and Van Luik discussed backfill and other issues. Dr. Hornberger asked if there were natural analogs to alloy 22. Dr. Hardin said that he was not sure if there are any natural analogs to alloy 22. Mr. Tim McCartin, NMSS, noted that he understood that the mineral Josephinite may be an analog and said he would get information on it.

Postclosure Defense in Depth

Mr. Jack Baily spoke on defense in depth. He discussed conservative vs. realistic models in TSPA and said that it is a subjective evaluation of where they stand. They decided to be either realistic or err on the conservative side of realism. He said that the TSPA has two areas of optimistic treatment: cladding and UZ zone transport based upon input from the TSPA-VA Peer Review Panel. He said that they don't want to mask system performance with approaches that are too conservative. He described the saturated zone model as very conservative and said more work may support a more realistic model of SZ transport. It may be adequate for the LA to demonstrate compliance, if they can adequately bound uncertainties without obscuring key aspects of model performance.

Mr. Bailey provided a general description of their view on DID. He said that they want to assure safety in the face of uncertainty. DID is an essential element of the postclosure safety case. He discussed the safety philosophy of multiple protective measures so that failure of one measure does not lead to system failure. They define DID in terms of multiple barriers, conservatism, redundancy, and diversity in system design. He added that quality assurance (QA) processes and other areas (e.g., emergency plans) are important parts of DID. He noted that the draft Part 63 no longer requires subsystem performance measures for principal barriers. Mr. Bailey said they plan on identifying the principal barriers and providing a transparent assessment of the contribution of each barrier. Their DID analyses will indicate system performance enhancement provided by multiple barriers and whether performance hinges on a single barrier system functioning as anticipated. In evaluating DID they identify the barriers, evaluate expected performance, evaluate threats to performance (e.g., common mode failures), and conduct analyses that allow neutralization of each barrier reflecting these threats. They then will compare performance with and without the barrier. He provided some preliminary examples of how they believe this approach could be implemented. He said in summary that the approach allows them to identify the principal barriers and illustrates redundancy of barriers and system resilience to threats.

Questions:

Dr. Hornberger noted that DID is poorly defined in terms of reactor probabilistic risk assessment (PRA) and it is not clear how DID can be applied to a waste repository. Mr. Jack Sorenson (ACRS staff) said that QA is part of DID in reactor PRAs. Dr. Fairhurst said he liked the approach and discussed some of the benefits of it. Dr. Steindler said that they are mixing the impact of design changes and the impact of Part 63 regulatory requirements. He asked what the use of this type of information is? Mr. Bailey discussed the rationale and process they used to develop this approach to DID. Dr. Wymer also said he liked the approach and noted the need to identify the performance of individual barriers. Dr. Campbell noted the similarities of DOE's DID approach to NRC's approach to importance measures. He asked about the need for this type of analysis in the context of Part 63 requirements. Mr. Bailey commented. Mr.

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McCartin, NMSS, stated that in drafting Part 63 they avoided any requirements for specific numerical analyses to demonstrate DID. He said that the draft rule only refers to the need to show that different barriers contribute to performance; it does not specify any requirements for this type of analysis. Dr. Norm Eisenberg, NMSS, commented on the similarities of the DID approach and NRC's approach to importance measures for waste repositories.

VI. EXECUTIVE SESSION (Open)

[Mr. Richard Major was the Designated Federal Official for this part of the meeting.]

The Committee agreed to delete the sentence "Either or both may be reelected to serve no more than one additional consecutive term at the discretion of the Committee" from the ACNW bylaws with regards to the election of the Committee Chairman and the Vice Chairman.

A. Future Meeting Agenda (Open)

Appendix IV summarizes the proposed items endorsed by the Committee for the 106th ACNW meeting, February 23-25, 1998.

B. Future Committee Activities (Open)

The 107th ACNW meeting is scheduled for March 16 and 17, 1999. The 108th ACNW meeting is scheduled for March 23-25, 1999.

**APPENDIX III: MEETING ATTENDEES
105TH ACNW MEETING
DECEMBER 15-17, 1998**

<u>ACNW STAFF</u>	<u>1st Day</u>	<u>2nd Day</u>	<u>3rd Day</u>
Dr. Andrew Campbell	<u>X</u>	<u>X</u>	<u>X</u>
Ms. Lynn Deering	<u>X</u>	<u>X</u>	<u>X</u>
Ms. Michele Kelton	<u>X</u>	<u>X</u>	<u>X</u>
Dr. John Larkins	<u>X</u>	<u>X</u>	<u>X</u>
Mr. Howard Larson	<u>X</u>	<u>X</u>	<u>X</u>
Mr. Richard Major	<u>X</u>	<u>X</u>	<u>X</u>
Ms. Mary Thomas	<u>X</u>	<u>X</u>	<u>X</u>

ATTENDEES FROM THE NUCLEAR REGULATORY COMMISSION

DECEMBER 15, 1998

J. Hickey	NMSS
N. Orlando	NMSS
S. Wastler	NMSS
R. Johnson	NMSS
B. Reamer	NMSS
P. Sobie	NMSS
T. Harris	NMSS
M. Bell	NMSS
M. Virgilio	NMSS
J. Holonich	NMSS
N. Eisenberg	NMSS
T. Kenyon	NRR
B. Huffman	NRR
D. Scaletti	NRR
M. Webb	NRR
D. Matthews	NRR
R. Cady	RES
P. Ray	NRR
R. Dudley	NRR

**APPENDIX III
105TH ACNW MEETING
DECEMBER 15-17, 1998**

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ATTENDEES FROM THE NUCLEAR REGULATORY COMMISSION (CONT'D)

DECEMBER 15, 1998 (Cont'd)

D. Wheeler	NRR
R. Burrows	NRR
M. Masnik	NRR
S. Shankman	NMSS
L. Kokajko	NMSS
C. Trottier	RES
G. Gnugnoli	NMSS
B. Eid	NMSS

DECEMBER 16, 1998

T. Ahn	NMSS
S. Wastler	NMSS
B. Leslie	NMSS
M. Nataraja	NMSS
J. Firth	NMSS
K. Chang	NMSS
C. McKenney	NMSS
J. Davis	NMSS
P. Justus	NMSS
J. Kotra	NMSS
D. Brooks	NMSS
J. Bradbury	NMSS
M. Lee	NMSS
G. Gnugnoli	NMSS
T. Carter	NMSS
T. McCartin	NMSS
R. Codell	NMSS
J. Costradi	NMSS
M Rose Byrne	NMSS
L. Hamdan	NMSS
M. Rahimi	NMSS

DECEMBER 17, 1998

R. Johnson	NMSS
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**APPENDIX III
105TH ACNW MEETING
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ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

DECEMBER 15, 1998

R. Wallace	USGS/HQ
L. Fairobent	The Environmental Company
D. Richardson	YMP/M&O
L. Bissell	Booz Allen/DOE
G. Adams	Wisconsin Electric
H. Elliot Chakoff	DOE-Idaho (consultant)
M. Beaumont	Consultant
M. David	Scientech Inc./ DOE-Idaho
M. Michewicz	DOE
H. B. Finger	Consultant
K. Singh	PA DEP (Department of Environ. Prot.)
C. Hanlon	DOE
A. van Luik	DOE
T. Hughes	PA Emergency Mgmt. Agency
R. Maiers	PA Bureau of Rad. Prot.

DECEMBER 16, 1998

H. Dockery	Sandia National Labs/ CRWMS M&O
R. Barnard	Sandia National Labs/CRWMS M&O
C. Hanlon	DOE
W. Matyskiela	Gamma Engineering
M. Scott	Duke Engineering/ CRWMS M&O
R. Wallace	USGS
D. Richardson	CRWMS/M&O
J. Bailey	CRWMS
K. Singh	PA Dept. Environ. Prot.
G. Adams	Wisconsin Electric
L. Bissell	Booz Allen/DOE
H. Elliot Chakoff	DOE - Idaho (consultant)
G. Roseboom	USGS
A. van Luik	DOE
J. Russell	CNWRA
E. Hardin	M&O/LLNL
M. Faud	Scientech Inc./DOE
P. LaPlante	CNWRA
T. Cotton	M&O

**APPENDIX III
105TH ACNW MEETING
DECEMBER 15-17, 1998**

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ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC (CONT'D)

DECEMBER 17, 1998

K. Singh	PA Dept. of Environ. Prot.
H. Elliot Chakoff	DOE-Idaho (consultant)
M. Scott	Duke Engineering
C. Hanlon	DOE

**NUCLEAR REGULATORY
COMMISSION**

ocket Nos. 50-254 and 50-265]

**Commonwealth Edison Co. and
MidAmerican Energy Co.; Quad Cities
Nuclear Power Station, Units 1 and 2;
Environmental Assessment and
Finding of No Significant Impact**

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of an order, approving under 10 CFR 50.80, the transfer of control of Facility Operating License Nos. DPR-29 and DPR-30, to the extent held by MidAmerican Energy Company (MidAmerican) for possession of the Quad Cities Nuclear Power Station, Units 1 and 2 (Quad Cities), located in Rock Island County, Illinois.

Environmental Assessment**Identification of the Proposed Action**

The proposed action would consent to the transfer of control of the licenses, with respect to MidAmerican's 25 percent ownership interest in Quad Cities, to the extent such transfer would be effected by a proposed corporate merger involving CalEnergy Company (CalEnergy) and MidAmerican Energy Holdings Company (MAHC), the parent of MidAmerican. Commonwealth Edison Company (ComEd) alone is licensed to operate, as well as possess Quad Cities and is not involved in the proposed merger. MidAmerican would continue to remain the minority owner and possession-only licensee of the facility.

The proposed action is in accordance with the application dated September 10, 1998, filed by CalEnergy and MidAmerican, accompanied by cover letters dated September 10, 1998, and supplemented by a letter dated September 16, 1998, and attachments thereto, from Roy P. Lessy, Jr., counsel for CalEnergy and MidAmerican.

The Need for the Proposed Action

The proposed action is needed to permit the consummation of the proposed corporate merger discussed above to the extent the merger will effect a transfer of control of the licenses.

**Environmental Impacts of the Proposed
Actions**

The Commission has completed its evaluation of the proposed merger and concludes that there will be no changes to Quad Cities or the environment as a result of this action. The transfer of control of the licenses to the extent effected by the merger between

MidAmerican and CalEnergy will not affect the numbers, qualifications, or organizational affiliation of the personnel who operate the facility, since ComEd is not involved in the proposed merger and will continue to be solely responsible for the operation of Quad Cities. No changes are being made with respect to any requirements governing plant operations or equipment.

The Commission has evaluated the environmental impact of the proposed action and has determined that the probability or consequences of accidents would not be increased by the proposed action and that post-accident radiological releases would not be greater than previously determined. Further, the Commission has determined that the proposed action would not affect routine radiological plant effluents and would not increase occupational radiological exposure. Accordingly, the Commission concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential non-radiological impacts, the proposed action would not affect non-radiological plant effluents and would have no other environmental impact. Therefore, the Commission concludes that there are no significant non-radiological environmental impacts associated with the proposed action.

Alternatives to the Proposed Action

Since the Commission has concluded that there are no significant environmental effects associated with the proposed action, any alternative with equal or greater environmental impact need not be evaluated.

The principal alternative would be to deny the requested approval. Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative actions are identical.

Alternative Use of Resources

The action does not involve the use of resources not previously considered in the Final Environmental Statement Related to Operation of Quad Cities Nuclear Power Station, Units 1 and 2, dated September 1972.

Agencies and Persons Consulted

In accordance with its stated policy, on September 30, 1998, the staff consulted with the Illinois State official, Mr. Frank Niziolek, Head, Reactor Safety Section, Division of Engineering, Illinois Department of Nuclear Safety, regarding the environmental impact of

the proposed action. The State official had no comments.

Finding of No Significant Impact

Based upon the foregoing environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to this action, see the request for approval dated September 10, 1998, accompanied by cover letters dated September 10, 1998, and supplemented by a letter dated September 16, 1998, and attachments thereto, from Roy P. Lessy, Jr., counsel for CalEnergy and MidAmerican, which are available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC, and at the public document room located at the Dixon Public Library, 221 Hennepin Avenue, Dixon, Illinois 61021.

Dated at Rockville, MD, this 4th day of November 1998.

For the Nuclear Regulatory Commission.
Stuart A. Richards,

Director, Project Directorate III-2, Division
of Reactor Projects—III/IV, Office of Nuclear
Reactor Regulation.

[FR Doc. 98-30255 Filed 11-10-98; 8:45 am]
BILLING CODE 7560-01-P

**NUCLEAR REGULATORY
COMMISSION***** Advisory Committee on Nuclear
Waste; Notice of Meeting**

The Advisory Committee on Nuclear Waste (ACNW) will hold its 105th meeting on December 15-17, 1998, Room T-2B3, 11545 Rockville Pike, Rockville, Maryland.

The entire meeting will be open to public attendance.

The schedule for this meeting is as follows:

Tuesday, December 15, 1998—8:30 a.m.
until 6:00 p.m.

Wednesday, December 16, 1998—8:30
a.m. until 6:00 p.m.

Thursday, December 17, 1998—8:30
a.m. until 4:00 p.m.

**A. Overviews of FY-99 NRC Staff
Programs**—The Committee will hear a number of briefings from the NRC staff on FY-99 waste related programs. These overviews will include decommissioning activities, the High Level Waste repository program, and

programs planned or underway in the spent fuel projects office.

B. Viability Assessment—The Committee will review the Department of Energy's Yucca Mountain viability assessment. This will include an overview of the Total System Performance Assessment and factors used in abstracting TSPA models, the repository safety strategy, performance allocation, and an overview of the license application plan.

C. Preparation of ACNW Reports—The Committee will discuss planned reports on the following topics: an ACNW self assessment; a 1999 Action Plan for the Committee; proposed importance measures for evaluating nuclear waste repository performance; issues related to regulatory guidance and a standard review plan for decommissioning; observations from the recent European technical exchange; and other topics discussed during this and previous meetings as the need arises.

D. Meeting with NRC's Director, Division of Waste Management, Office of Nuclear Material Safety and Safeguards—The Committee will meet with the Director to discuss recent developments within the division such as developments at the Yucca Mountain project, rules and guidance under development, available resources, and other items of mutual interest.

E. Prepare for the Next Meeting with the Commission—The Committee will begin preparations for its next public meeting with the Commission. Topics to be discussed will be selected and Committee assignments made.

F. Committee Activities/Future Agenda—The Committee will consider topics proposed for future consideration by the full Committee and Working Groups. The Committee will discuss ACNW-related activities of individual members.

G. Miscellaneous—The Committee will discuss miscellaneous matters related to the conduct of Committee activities and organizational activities and complete discussion of matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

Procedures for the conduct of and participation in ACNW meetings were published in the Federal Register on September 29, 1998 (63 FR 51967). In accordance with these procedures, oral or written statements may be presented by members of the public, electronic recordings will be permitted only during those portions of the meeting that are open to the public, and questions may be asked only by members of the Committee, its

consultants, and staff. Persons desiring to make oral statements should notify the Chief, Nuclear Waste Branch, Mr. Richard K. Major, as far in advance as practicable so that appropriate arrangements can be made to schedule the necessary time during the meeting for such statements. Use of still, motion picture, and television cameras during this meeting will be limited to selected portions of the meeting as determined by the ACNW Chairman. Information regarding the time to be set aside for taking pictures may be obtained by contacting the Chief, Nuclear Waste Branch, prior to the meeting. In view of the possibility that the schedule for ACNW meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should notify Mr. Major as to their particular needs.

Further information regarding topics to be discussed, whether the meeting has been canceled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefor can be obtained by contacting Mr. Richard K. Major, Chief, Nuclear Waste Branch (telephone 301/415-7366), between 8:00 a.m. and 5:00 p.m. EST.

ACNW meeting notices, meeting transcripts, and letter reports are now available for downloading or reviewing on the internet at <http://www.nrc.gov/ACRSACNW>.

The ACNW meeting dates for Calendar Year 1999 are provided below:

ACNW Meeting No.	1999 ACNW meeting date
106th	No Meeting in January. February 22-26, 1999 (San Antonio, Texas).
107th	March 23-25, 1999. No Meeting in April.
108th	May 11-13, 1999.
109th	June 15-17, 1999.
110th	July 19-21, 1999.
111th	No Meeting in August. September 14-17, 1999 (Amargosa Valley, Nevada).
112th	October 12-14, 1999.
113th	No Meeting in November. December 14-16, 1999.

Dated: November 5, 1998.

Andrew L. Bates,

Advisory Committee Management Officer.

[FR Doc. 98-30260 Filed 11-10-98; 8:45 am]

BILLING CODE 7530-01-P

NUCLEAR REGULATORY COMMISSION

Sunshine Act Meeting

AGENCY HOLDING THE MEETING: Nuclear Regulatory Commission.

DATE: Weeks of November 9, 16, 23, and 30, 1998.

PLACE: Commissioners' Conference Room, 11555 Rockville Pike, Rockville, Maryland.

STATUS: Public and Closed.

MATTERS TO BE CONSIDERED:

Week of November 9

Thursday, November 12

11:30 a.m.

Affirmation Session (Public Meeting) (if needed)

Friday, November 13

9:00 a.m.

*Meeting on NRC Response to Stakeholders' Concerns (Public Meeting) (Contact: Bill Hill, 301-415-1661/1969)

*Please Note: The room location for the Meeting on NRC Response to Stakeholders' Concerns, scheduled for Friday, November 13, is in the NRC auditorium, Bldg 2, NRC Headquarters, Rockville, Md.

Week of November 16—Tentative

Tuesday, November 17

11:30 a.m.

Affirmation Session (Public Meeting) (if needed)

Week of November 23—Tentative

Tuesday, November 24

9:00 a.m.

Briefing on fire Protection Issues (Public Meeting) (Contact: Steve West, 301-415-1220)

Wednesday, November 25

11:30 a.m.

Affirmation Session (Public Meeting) (if needed)

Week of November 30—Tentative

Monday, November 30

2:00 p.m.

Meeting of DC Cook (Public Meeting) (Contact: John Stang, 301-415-1345)

3:30 p.m.

Affirmation Session (Public Meeting) (if needed)

The schedule for Commission meetings is subject to change on short notice. To verify the status of meetings call (recording)—(301) 415-1292.

CONTACT PERSON FOR MORE INFORMATION: Bill Hill (301) 415-1661.

* * * * *

ADDITIONAL INFORMATION: By a vote of 5-0 on November 3, the Commission determined pursuant to U.S.C. 552b(e) and § 9.107(a) of the Commission's rules that "BRIEFING BY EXECUTIVE BRANCH" (Closed Ex.-1) be held on



APPENDIX II

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555-0001

December 8, 1998

SCHEDULE AND OUTLINE FOR DISCUSSION
105TH ACNW MEETING
DECEMBER 15-17, 1998

Tuesday, December 15, 1998, Two White Flint North, Room T-2B3, 11545 Rockville Pike, Rockville, Maryland

- | | | | |
|---------------|--|--|---|
| | 8:35 - 8:45 | | |
| 1) | 8:30 - 8:40 A.M. | <u>Opening Remarks by the ACNW Chairman (Open)</u> | |
| | | 1.1) | Opening Statement (BJG/RKM) |
| | | 1.2) | Items of Interest (BJG/RKM) |
| 2) | 8:40 - 9:10 A.M.
8:45 9:20 | <u>Meeting with John Greeves, NRC's Director, Division of Waste Management, Office of Nuclear Material Safety and Safeguards (Open) (BJG/RKM)</u> | |
| | | A current events discussion with the Director to discuss developments at Yucca Mountain, rules and guidance under development, resources, and other issues of mutual interest. | |
| | 9:20 | | |
| 3) | 9:10 - 2:15 P.M. | <u>Overview of FY99 NRC Staff Programs (Open) (RGW/HJL)</u> | |
| 9:20 - 10:20 | 9:10 - 10:00 A.M. | 3.1) | Overview of FY-99 High-Level Waste Repository Program |
| 10:20 - 10:35 | 10:00 - 10:15 A.M. | ***BREAK*** | |
| 10:35 - 11:20 | 10:15 - 11:15 A.M. | 3.2) | Overview of FY-99 Decommissioning Program (NMSS) |
| 11:20 - 12:11 | 11:15 - 12:15 P.M. | 3.3) | Overview of FY-99 Decommissioning Program (NRR) |
| | 12:11 - 1:20 | ***LUNCH*** | |
| | 12:15 - 1:15 P.M. | | |
| | 1:15 - 2:15 P.M. | 3.4) | Overview of FY-99 Spent Fuel Program Office, Programs |
| | 1:20 - 2:15 | a) | Status of PGE/Trojan Reactor Pressure Vessel Shipment |
| | | b) | DOE Oversight Activities |
| | | c) | SFPO Rulemakings |
| 4) | 2:15 - 3:15 P.M.
3:00 | <u>Comparison of DandD and ResRad Computer Codes Used in Decommissioning Analysis - Cheryl Trottier, RES</u> | |
| | 3:15 - 3:30 P.M. | ***BREAK*** | |
| | 3:00 - 3:20 | | |

Note:

Entire Meeting Open to Public.

- 5) ~~2:30-6:00 P.M.~~
3:55 6:30
- Preparation of ACNW Reports (Open)
Discuss possible reports on the following topics:
- 5.1) ACNW self assessment
 - 5.2) 1999 ACNW Action Plan
 - 5.3) Importance Measures for evaluating nuclear waste repository performance
 - 5.4) Decommissioning Standard Review Plan
 - 5.5) ACNW observations and comments stemming from the recent visit to Germany, September 14-18, 1998
 - 5.6) German Trip Report
- 6:30
~~6:00 P.M.~~ *****RECESS*****

Wednesday, December 16, 1998, Two White Flint North, Room T-2B3, 11545 Rockville Pike, Rockville, Maryland

- 6) ~~8:35 8:39~~
8:30 - 8:35 A.M. Opening Remarks by ACNW Chairman (Open) (BJG/RKM)
- 7) ~~8:35- 3:30 P.M.~~
8:40 DOE's Total Systems Performance Assessment (Open) (GMH/ACC)
- 7.1) Repository Safety Strategy
 - 7.2) Overview of Total Systems Performance Assessment
 - 7.3) Composite Analyses for TSPA Model Results
- (10:30 A.M. BREAK)
10:50 - 10:05
- 12:00 - 1:00 P.M. *****LUNCH*****
12:10 1:18
- 7.4) Prioritizing Technical Work
 - 7.5) Post Closure Defense In-depth (reducing uncertainty)
- 3:05 3:30
3:30 - 3:45 P.M. *****BREAK*****
- 8) ~~3:30-4:15~~
3:45 - 6:00 P.M. Continue preparation of ACNW Reports (as noted in item 5)
4:25-6:00 Discussion on 12/16/98 TSPA Presentations
- 6:00 P.M. **RECESS**
4:15- 4:25 Discussion on amending Bylaws

Thursday, December 17, 1998, Two White Flint North, Room T-2B3 11545 Rockville Pike, Rockville, Maryland

- 8:35 8:40
- 9) ~~8:30~~ - 8:35 A.M. Opening Remarks by ACNW Chairman (Open)(BJG/RKM)
- 10) ~~8:35~~ - 10:00 A.M. Committee Activities/Future Agenda (Open)(BJG/RKM)
- 10.1) Finalize Agenda for 106th ACNW Meeting, February 23-25, 1999
 - 10.2) Review Topics for Out months
 - 10.3) Review EDO response to recent Committee letters
 - 10.4) Recent and Planned Attendance at outside meetings
- 8:40 10:35 and
11:45 12:35
-
- 12/17 11:25 - 11:45

105TH ACNW MEETING

3

~~10:00~~ ~~10:45~~

~~10:00 - 10:45 A.M.~~ ***Break***

11) ~~10:15 - 11:30 A.M.~~

Preparation for Next Meeting with the Commission (Open)
(BJG/RKM)

12/16

~~3:20 - 3:55~~

11.1) Select topics to be discussed
11.2) Make Committee assignments

12) ~~11:30 - 3:00 P.M.~~

Continue Preparation of ACNW Reports as noted in item 5

~~12:25~~

~~3:00 P.M.~~

ADJOURN

- Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.
- Number of copies of the presentation materials to be provided to the ACNW - 40.

APPENDIX IV: FUTURE AGENDA

The Committee agreed to consider the following during the 106th ACNW Meeting, February 23–25, 1999:

- **Viability Assessment** — The Committee will continue its review of DOE's Yucca Mountain VA. Discussions with representatives of DOE and the NRC staff are anticipated. Committee members will discuss their own internal review of the VA.
- **Waste-Related Research** — The Committee will review nuclear waste-related research and technical assistance being performed for the NRC. The Committee will present the results of this review in a report due to the Commission in April 1999. Discussion with representatives of NRC's RES and NMSS is anticipated.
- **Repository Design** — The Committee will begin work on a white paper that addresses repository design issues for Yucca Mountain. The paper will focus on the results of thermal testing and modeling and how moisture contacts and affects the waste package. The Committee may also examine the significance of coupled effects, aspects of waste retrievability, repository ventilation, rock fall, and water dripping into drifts.
- **Meeting With Representatives From the Nuclear Energy Institute** — Representatives from the Nuclear Energy Institute will present their perspective on the upcoming year. Topics will focus on the U.S. HLW program and related legislation.
- **Preparation for the Next Meeting With the Commission** — The Committee will begin preparations for its next public meeting with the Commission. Specific topics for discussion will be finalized and reviewed.
- **Preparation of ACNW Reports** — The Committee will discuss planned reports, including reports on DOE's VA, NRC-supported waste-related research, a white paper on HLW repository issues at Yucca Mountain, and other topics discussed at this and previous meetings.

**APPENDIX V
LIST OF DOCUMENTS PROVIDED TO THE COMMITTEE**

[Note: Some documents listed below may have been provided or prepared for Committee use only. These documents must be reviewed prior to release to the public.]

MEETING HANDOUTS

**AGENDA
ITEM NO.**

DOCUMENTS

- | | |
|------------|--|
| 3 | <u>OVERVIEW OF FY 1999 NRC STAFF PROGRAMS</u> |
| 3.1 | Overview of FY99 HLW Repository Program <ol style="list-style-type: none">1. Overview of HLW FY99 Budget Priorities and Proposed ACNW Interactions, presented by Michael J. Bell, Acting Branch Chief, Performance Assessment and HLW Branch, NMSS, December 15, 1998 [Viewgraphs] |
| 3.2 | Overview FY99 Decommissioning Program - NMSS <ol style="list-style-type: none">2. Overview of NRC's Materials Decommissioning Program, presented by John Hickey, NMSS, December 15, 1998 [Viewgraphs] |
| 3.3 | Overview FY99 Decommissioning Program - NRR <ol style="list-style-type: none">3. Decommissioning Nuclear Power Reactor Briefing for ACNW, December 15, 1998 - Decommissioning Overview, presented by Ronald A. Burrows, Project Manager, Non-Power Reactor and Decommissioning Project Directorate, Division of Reactor Program Management, NRR [Viewgraphs]4. Reactor Decommissioning Process, December 15, 1998, presented by Michael Webb, Project Manager, Non-Power Reactor and Decommissioning Project Directorate, Division of Reactor Program Management, NRR [Viewgraphs] |

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DOCUMENTS

3.3 (Cont'd)

Overview FY99 Decommissioning Program - NRR

5. Presentation on License Termination Plan Requirements (10 CFR 50.82(a)(9) & 10 CFR Part 20, Subpart E) for Reactor Decommissioning, December 15, 1998, presented by C. L. Pittiglio, Division of Waste Management, NMSS [Viewgraphs]
6. Status of Decommissioning Nuclear Power Reactors, December 15, 1998, presented by Phillip M. Ray, Project Manager, Non-Power Reactor and Decommissioning Project Directorate, Division of Reactor Program Management, NRR [Viewgraphs]
7. Regulatory Guidance and Process Improvements, December 15, 1998, presented by Richard F. Dudley, Sr. Project Manager, Non-Power Reactor and Decommissioning Project Directorate, Division of Reactor Program Management, NRR [Viewgraphs]

3.4

Overview of FY99 Spent Fuel Program Office Programs

8. Approach to Licensing Reviews, presented by Susan F. Shankman, Deputy Director, Spent Fuel Project Office, NMSS [Viewgraphs]
9. Trojan Reactor Vessel Shipment Application, presented by Susan F. Shankman, Deputy Director, Spent Fuel Project Office, NMSS [Viewgraphs]

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COMPARISON OF DANDD AND RESRAD COMPUTER CODES USED IN DECOMMISSIONING ANALYSIS

10. Model Comparison, prepared by Christine Daily, Division of Regulatory Applications, RES, presented by Cheryl Trottier, Director, Division of Regulatory Applications, RES [Viewgraphs]
11. Status of NRC's Support of the Sandia Environmental Decision Support System (SEDSS), presented by Ralph Cady, RES, December 15, 1998 [Viewgraphs]

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DOE'S TOTAL SYSTEMS PERFORMANCE ASSESSMENT

12. Repository Safety Strategy: U. S. Department of Energy's Strategy After Closure of a Yucca Mountain Repository, YMP/96-01, Revision 2, December 1998 **[Handout]**
13. Repository Safety Strategy, presented by Jack N. Bailey, Director, Regulatory and Licensing, Management & Operating Contractor, December 16, 1998 **[Viewgraphs]**
14. Total System Performance Assessment Overview, presented by Abraham Van Luik, Senior Technical Advisory, Performance Assessment, Yucca Mountain Site Characterization Office, DOE, December 16, 1998 **[Viewgraphs]**
15. Comparative Analyses to Determine Sensitivity of Uncertainty for Principal Factors, presented by Holly A. Dockerty, Deputy Operations Manager, Performance Assessment, Management & Operating Contractor, December 16, 1998 **[Viewgraphs]**
16. Prioritization of Technical Work Needed to Complete the Postclosure Safety Case, presented by Ernest L. Hardin, Technical Lead, Near-Field Models, Management & Operating Contractor **[Viewgraphs]**
17. Postclosure Defense in Depth, presented by Jack N. Bailey, Director, Regulatory and Licensing, Management & Operating Contractor, December 16, 1998 **[Viewgraphs]**

Appendix V
105TH ACNW Meeting
December 15-17, 1998

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1. Schedule and Outline for Discussion, 105th ACNW Meeting, December 15-17, 1998, dated December 8, 1998
 2. Introductory Statement by the ACNW Chairman, undated
 3. Items of Current Interest, undated
 4. Introductory Statement by the ACNW Chairman, Second Day, undated
 5. Introductory Statement by the ACNW Chairman, Third Day, undated
- 2** **Meeting With the Director, Division of Waste Management, NMSS**
6. Status Report
- 3** **Overview of FY 1999 Staff Programs, Comparison of DandD and RESRAD Programs**
7. Status Report
Enclosures
 1. "Announcement of workshops on Draft Guidance on Radiological Criteria for License Termination," *Federal Register*, Vol. 63, No. 203, Wednesday, October 21, 1998
 2. "Final Agenda for December 1-2, 1998 Workshop: Public Workshop on Guidance for Implementing 10 CFR 20, Subpart E, Radiological Criteria for License Termination," (E-mail dated November 16, 1998 from Christine Daily)
 3. "Supplemental Information on the Final Rule on Radiological Criteria for License Termination," *Federal Register*, Vol. 63, No. 222, Wednesday, November 18, 1998 (Draft of this *Federal Register* Notice was provide via a Memorandum from H. J. Larson, ACNW Staff, to ACNW Members, dated November 17, 1998, attached)
 4. Viewgraphs by Christine Daily, Model Comparisons
- 5.2** **FY 1999 ACNW Action Plan**
8. Letter dated December 2, 1998 from Lynn Deering, ACNW Staff, to ACNW Members and Staff re proposed changes to ACNW Action Plan

MEETING NOTEBOOK CONTENTS (CONT'D)

Appendix V
105TH ACNW Meeting
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DOE's Total Systems Performance Assessment

9. Status Report

Enclosures

1. "Repository Safety Strategy: U.S. Department of Energy's Strategy to Protect Public Health and Safety After Closure of a Yucca Mountain Repository," Revision 1, January 1998
2. "Evolution of the Postclosure Repository Safety Strategy and Safety Case," viewgraphs presented by Dr. Jean Younker at the NRC/DOE Technical Exchange, September 16, 1998
3. "Plans for the Development of the TSPA for the Site Recommendation and License Application," viewgraphs presented by Dr. Holly Dockery at the NRC/DOE Technical Exchange, September 16, 1998
4. "Performance Allocation and Identification of Needed Information—The Path Forward to the Postclosure Safety Case," viewgraphs presented by Mr. Jack Bailey at the NRC/DOE Technical Exchange, September 16, 1998
5. "System Level Sensitivity Results and Alternative Conceptual Models in TPA 3.1," viewgraphs presented by R. B. Codell and M. R. Byrne at the 100th ACNW Meeting, April 22, 1998
6. "License Application Plan: Site Investigations," viewgraphs presented by Dr. Jean Younker and the NRC/DOE Technical Exchange, September 16, 1998
7. "License Application Plan: Design Overview," viewgraphs presented by Richard Snell at the NRC/DOE Technical Exchange, September 16, 1998
8. "Third Interim Report: Total System Performance Assessment Peer Review Panel," June 1998

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Committee Activities/Future Agenda

10. Enclosures

1. Set Agenda for the 106th ACNW Meeting, February 23–25, 1999
2. Set Agenda for Out Months Through March 1999
3. ACNW 1999 Meeting Calendar
4. EDO's List of Future Meeting Topics
5. OCRWM/M&O Meeting Status (11/30/98)
6. Reconciliation EDO Responses to ACNW Reports
7. Discuss Attendance at Past Outside Meetings and Plans to Attend

Appendix V
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Future Meetings

Past Meetings

- Sandia RES Review
- Ground Control and Drift Stability
- Nye County Ventilated Repository

Future Meeting

- NWTRB on Repository Design

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Preparation for Next Meeting With Commission

11. Tentatively Scheduled Topics