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300ST ACRS MEETING
APRIL 11-13, 1985
WASHINGTON, DC





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PROPOSED MINUTES OF THE
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The 300th meeting of the Advisory Committee on Reactor Safeguards, held at 1717 H Street, N.W., Washington, D.C., was convened by Chairman D. A. Ward at 8:30 a.m., Thursday, April 11, 1985.

[Note: For a list of attendees, see Appendix I.]

Chairman D. A. Ward noted that existence of the published agenda for this meeting, and identified the items to be discussed. He noted that the meeting was being held in conformance with the Federal Advisory Committee Act and the Government in the Sunshine Act, Public Laws 92-463 and 94-409, respectively. He also noted that a transcript of some of the public portions of the meeting was being taken, and would be available in the NRC's Public Document Room at 1717 H Street, N.W., Washington, D.C.

[Note: Copies of the transcript taken at this meeting are also available for purchase from Ace-Federal Reporters, Inc., 444 North Capitol Street, Washington, D.C. 20001.]

I. Chairman's Report (Open)

[Note: R. F. Fraley was the Designated Federal Official for this portion of the meeting.]

Chairman D. A. Ward identified the members of the panel that will examine ACRS effectiveness. The Chairman of the panel is to be L. Manning Muntzing of Doub and Muntzing. Other members of the panel are John F. Ahearne, Vice President, Resources for the Future, Myer Bender, Querytech Inc., Herbert J. C. Kouts, Department of Nuclear Energy at Brookhaven National Laboratory, Edson G. Case (former NRC Staff member with the Office of Nuclear Regulatory Research), Homer J. Hagedorn, Arthur D. Little Inc. and John M. West, formerly with Combustion Engineering Inc. They expect to have a final report by August 1, 1985. He indicated that the proposed approach is to develop a scenario for nuclear power to the year 2000. A list of questions will be developed involving areas in which the ACRS should function. The panel intends to interview a broad cross-section of individuals including current and past ACRS members, NRC Commissioners, NRC Staff members, nuclear industry representatives, representatives of the national laboratories, members of organized intervenor groups, and Congressional Staff. He indicated that the panel is particularly interested in current individual ACRS members' concepts of the role of the ACRS.

II. General Electric Company Standardized Safety Analysis (GESSAR II) (Closed)

# DELETION 3

III. Nuclear Accident Source Term (Open)

[Note: G. R. Quittschreiber was the Designated Federal Official for this portion of the meeting.]

R. Wilson, Director of the American Physical Society (APS) Study Group that was assigned the task of evaluating radionuclide releases following a major accident in a nuclear power plant, explained the difficulty his Group had in culling the important information from a voluminous amount of reports and data. He indicated that there appeared to be great confusion on the subject of radionuclide source terms and the entire matter was also, of course, in a state of flux. He thought that many of the calculations were suspect. However, the APS Committee concluded in the end that the source term was, in general, smaller then previously reported. The Study Group found that considerable progress has been made since publication of the Reactor Safety Study in developing both the scientific basis and calculational basis for a particular source term. He pointed out that in a number of cases new calculations indicate that the quantity of radionuclides that could reach the environment are significantly lower than that calculated in the Reactor Safety Study. This reduction is due to three principal factors:

- Recognition that reactor containments are stronger than assumed in the Reactor Safety Study
- Inclusion in the updated model of previously neglected physical and chemical phenomena which lead to the retention of fission products in the primary system and in the containment
- Recognition of the fact that radionuclides are trapped more efficiently by supression pools or ice condenser systems than previously assumed

He indicated that more realistic modeling of the chemical and physical phenomena reduced the source term for most sequences from that calculated in the Reactor Safety Study. For some sequences, however, one mechanism that might increase the radionuclide release above those calculated in the Reactor Safety Study would be release of non-volatile radionuclides in core-concrete interaction. He suggested that it is important to complete the experiments now

underway in this critical area. He also pointed out that analyses performed in recent severe accident studies have not treated all types of reactors and all types of containments in equal detail. The Study Group took no position on the desirability of changes in emergency planning regulations. It was not in the scope of review for the Study Group to make that recommendation.

R. Wilson stated that one may not assume that the source term would always be a small fraction of that calculated in the Reactor Safety Study. As an example, he cited calculations from Sandia for a Mark I boiling water reactor that pointed to the release of lanthanum in greater amounts than contained in the Reactor Safety Study. While the iodine release may be one to two percent of that previously calculated, the critical amount for lanthanum, a rare earth element, is about one-tenth of a percent because of its high dose conversion factor. Until questions such as this are sorted out, the Study Group cannot make explicit predictions of the amounts of various radionuclides in the source term. R. Axtmann asked if the APS Group considered the influence of radiation in aerosol phenomena. The group's general conclusion was that radiation effects would not alter significantly any of their conclusions. Dr. Wilson indicated that the entire question of aerosol deposition within containment was too confused for the Study Group to want to comment very strongly about it. He mentioned the scenario where aerosols deposited in the upper plenum might be shaken loose by the mechanism of a steam explosion. While the Study Group thought that the probability of a steam explosion lifting the reactor vessel or breaking open the containment was quite small, they believe that a small steam explosion is not only possible but has a probability of approximately unity. This would strongly influence the amount of aerosol deposition in the containment.

W. Kerr asked if the APS Study Group identified accident scenarios in which the consequences are likely to be larger than the consequences calculated in WASH 1400. R. Wilson indicated that the Study Group is not willing to make an absolute statement on that issue. He indicated, for example, that the study group was unsure of the consequences of core-concrete interaction in a BWR Mark I containment with an early containment failure.

W. Kerr asked what the study group had identified as the most crucial uncertainties and the most important unknowns. R. Wilson cited that the most crucial one, core-concrete interaction may be moot for most of the BWR Mark II and Mark III containments since the molten core would fall into water if it melted through the vessel. There is the need to investigate the shaking loose of deposited aerosols, the effect of steam generator tube ruptures, and subsequent releases to the environment.

M. W. Carbon asked if there are any containments or reactors for which the Study Group can state with surety that the source term will be significantly less than that in WASH 1400. R. Wilson explained that the only containment for which such a statement can be made is the large dry PWR containment and then only with some

qualifications. M. W. Carbon asked how much lower the study group thinks the source term might be against the WASH 1400 numbers. R. Wilson indicated that the iodines might be on the order of one percent. For the lanthanides the number could be about one-tenth of one percent or a little less. For lanthanum it would be somewhat below that. He cautioned that one must be sure that the lanthanum is down to a tenth of one percent or less before one makes the assumption that the source term will be a factor of 100 smaller since the amount of lanthanum present is crucial. M. W. Carbon asked if there were other containments for which the Study Group could not make firm statements. R. Wilson indicated that they did not make firm statements about the BWR Mark I containment because of lack of information. However, from information garnered in the last six weeks it appears that the results for BWR Mark II and Mark III containments are going to be very different from the BWR Mark Is. He expressed concern regarding the sometimes claimed decontamination factors of $10^4$ for the suppression pool, believing that it is too optimistic. Suppression factors of 5-10 may be supportable but not the $10^4$ claimed by GE. He indicated that the Study Group has found the possibility of significant quantities of gas effectively bypassing the suppression pool. This was not considered in the General Electric (GE) calculations.

R. Wilson indicated that there was no question that additional experimentation needs to be undertaken to complete the source term work so that a reasonable set of decisions might be made for the next 20 years regarding the correct types of nuclear power plants to build. W. Kerr asked how long it might take to get the kinds of results thought appropriate by the Study Group. R. Wilson thought that probably in the next two years there would be much data out on the experiments now in progress and one would need an additional year to digest and analyze the results of those experiments.

W. Kerr inquired as to the quality of information that one might expect to get from computer codes in describing phenomena like the core-concrete interaction and the details of core slumping. R. Wilson thought that the core slumping problem would not be soluble through the use of computer codes. One has to take into account the possibility of steam explosions. The core-concrete interaction is an endothermic reaction which requires a considerable amount of available energy. It is very sensitive to temperature and there is considerable uncertainty in past experiments regarding temperature. Nevertheless, the Study Group is convinced that core-concrete interactions will take longer than previously predicted and can be well defined in computer models. R. Wilson thought there has been too much emphasis on the outputs of computer codes and too little emphasis on input data and assumptions. W. Kerr suggested that it might be well to try to understand the experiments before one inputs data into computer codes.

R. Wilson indicated that the core-concrete interaction problem becomes moot in the case of BWR Mark IIs and Mark IIIs because the core melt is trapped in the suppression pool. There is concern, however, regarding gases released in the core-concrete interaction

and the deposition rates of aerosols. A principal question is whether the containment fails when the core melts through the reactor vessel.

D. Okrent asked if the Study Group was able to determine which accident initiators have the capability for producing early containment failures. R. Wilson indicated that the Study Group had satisfied itself that the double-ended guillotine break was unlikely to lead to early containment failure. More likely are simply failures to isolate the containment when the accident occurs. D. Okrent asked if seismically induced accidents were considered. R. Wilson indicated that the Study Group did not take up this matter, but thought that earthquakes and sabotage should be considered.

IV. NRC Vendor Inspection Program (Open)

[Note: R. F. Fraley was the Designated Federal Official for this portion of the meeting.]

G. Zech, NRC Vendor Program Branch, presented an historical summary of the origin of the Vendor Program Branch (see Appendix V). He indicated that the initial interest in this group occurred in the late 1960's at the onset of concerns about certain quality assurance problems. This led to a two year trial program involving several fabricators. Oyster Creek was one plant where many QA problems came to the attention of the Commissioners and the industry and which resulted in the incorporation of quality assurance regulations in 10 CFR Part 50, Appendix B. The two year trial program was successful in that the number of defects was decreased. D. Okrent asked what the construction permit holders responsibility would be in this regard. G. Zech indicated that their responsibility is the ultimate responsibility through their license and Appendix B. They are to do programmatic source evaluations and implementation audits, although they may look at the same things as the Vendor Inspection Program audit. D. Okrent asked if the Appendix B standards had changed over the years. G. Zech indicated that they are changing now in that ANSI N-45.2 and its many daughter standards are being replaced by NQA-1, a quality assurance standard that the Staff is reviewing and will endorse in Regulatory Guide 1.28. D. Okrent noted and asked specifically why there has been an increase in interest in quality assurance practices since 1972. G. Zech explained that it is connected with the area of acceptable quality in concert with some level of acceptable practices in the nuclear industry. Of particular concern is the possibility of the application of different concepts for use in the next generation of nuclear plants and whether they would be more effective.

G. Zech explained that the basic objective of the vendor inspection program is to conduct inspections of both vendors and licensees to determine the adequacy of licensing controls over vendor suppliers. The Branch is to determine the cause of known vendor inefficiencies and to assess their generic implications.

G. Zech described the vendor programs inspection authority as embodying a self-reporting requirement of corporate officials. This is part of the Energy Reorganization Act and a 10 CFR Part 21 requirement where the Vendor Program Branch can go to a vendor facility and issue a notice of violation. D. A. Ward asked if the self-reporting extends to an Appendix K analysis. G. Zech indicated that Appendix k analyses definitely fall under this requirement. He added that it could be any analysis performed, such as Appendix B type calculations, or any services provided to the licensee of a safety-related nature. D. A. Ward asked if a licensee's PRA is also covered under this regulation. G. Zech indicated that he was unaware of any case where such an analysis formed a basis for a licensing action. W. Kerr pointed out that PRAs are not safety-related.

G. Zech discussed the organization of the Vendor Program Branch. He mentioned a Reactor Inspection Section that is involved with materials manufacturers and suppliers and components and equipment suppliers, and a Special Project Inspection Section that deals with AEs and nuclear steam suppliers, fuel fabricators, and third party inspection organizations. Also mentioned was an Equipment Qualification Inspection Section that deals with testing laboratories and facilities and licensee implementation of the EQ 50.49 rule. A Program Coordination Section coordinates interfaces with other NRC organizations and also performs generic assessments of inspection results. D. W. Moeller asked how the benefits of the vendor inspection program are assessed. G. Zech mentioned a NUREG called the "White Book" issued quarterly in which vendors and utilities provide feedback. This provides a gauge of how well the issues are being addressed. He noted a generic letter 83-28 that followed the Salem event which required all utilities to look at safety-related equipment and to establish interaction with vendor suppliers. He suggested that one true benefit could be realized if the utilities establish a dialogue with their suppliers regarding NRC's vendor inspection results. He mentioned the screening of data on potential generic issues and certain interactions that have been developed with AEOD and NRR.

C. Michelson asked if the Branch uses the screening activity of others. G. Zech indicated that the Branch utilizes the tracking of others when possible. C. Michelson asked what normally prompts the Vendor Inspection Branch to perform an inspection. G. Zech indicated that the Branch studies all defects reported on a vendor's product and looks at the cumulative effects. The reporting of a number of deficiencies over a several month period will probably be cause for the conduct of an inspection. C. Michelson asked if the Branch is screening information on motor-operated valves while awaiting for AEOD to signal that there is a particular problem. G. Zech indicated that the Vendor Inspection Branch has an extensive file on MOVs and has conducted follow-up inspections on deficiencies in addition to availing itself of the benefits of AEOD studies performed in this area. C. Michelson asked if the Branch is looking for the root cause of vendor

deficiencies. G. Zech pointed to the issuance of information notices and bulletins when problems are found and also CEO letters and enforcement actions.

W. Kerr noted that many of the diesels used in nuclear plants are manufactured by General Motors. G. Zech acknowledged that a number are supplied by General Motors either directly or indirectly through another diesel supplier. W. Kerr noticed that the Vendor Inspection Branch does not inspect General Motors. He suggested that, when one talks about a vendor, that does not always mean the manufacturer, but an organization from which the utility buys something. G. Zech admitted that there is a fine dividing line between a company that provides equipment to commercial grade procurement practices and one which is required to adhere to Appendix B or Part 21 regulations. The Part 21 and Appendix B safety-related procurement is one of the primary bases for going into a vendor shop. He suggested that the company that procures diesels from General Motors should have requirements that adequately test the diesel. W. Kerr suggested that it is therefore unnecessary in the view of NRC to inspect a vendor as long as someone does some testing and the Staff can inspect them. G. Zech indicated that is basically true.

J. C. Ebersole brought up the case of Transamerica Delaval, Inc. diesel problems at Shoreham. G. Zech indicated that this company had been under investigation since 1978. In the most recent case just prior to the Shoreham crankcase event, some serious quality assurance problems were found during inspections. These involved poor procedures, a number of training deficiencies, and noncompliances with their own requirements. J. C. Ebersole noted the efforts by that manufacturer to shave materials by cutting down crankshaft sizes. G. Zech indicated that tests were conducted before delivery as well as in the field. J. C. Ebersole suggested that something was wrong with the tests because the crankshafts collapsed afterward. C. J. Wylie suggested that what happened was poor design and poor development in testing to prove that what they were designing was correct. The Shoreham machine was an adaption of a previous design that was upgraded by increasing the speed of rotation of the shaft. Apparently, research was not done on the tortional vibration under the increased speed and the shaft was over-stressed.

D. Okrent noted a number of problems in vendor-supplied pipe snubbers. He asked if the Branch has done anything concerning hardware quality in this area. G. Zech indicated that the snubber problem has been looked at in some depth by the Vendor Inspection Program. There is some question, however, regarding whether the vendors themselves are contributing to the problem or whether the problem involves field installation problems. W. Kerr asked if the Branch has made any assessment of the root cause of the snubber problems. He asked if the problem of snubbers has now been solved in the view of the Vendor Inspection Branch. G. Zech suggested that there is still some work that needs to be done in the snubber area by both the industry and the NRC. The Vendor Inspection

Branch continues to conduct inspections and pass the results of those inspections on to NRR. W. Kerr asked for a gauge on what fraction of the difficulty with snubbers may be the cause of manufacturing and what fraction is due to poor maintenance or installation. G. Zech indicated that he would inquire as to the cognizant Staff individual in NRR for resolution of the problems with snubbers. D. Okrent speculated on whether it was the job of the Vendor Inspection Branch to delve deeply into the reasons for design deficiencies. G. Zech indicated that the Vendor Inspection Program is not charged to determine whether a design is adequate but only to see if the specifications mandated are followed.

C. J. Wylie asked if the Staff hires experienced consultants to assist in its inspection work. G. Zech indicated that it does. C. J. Wylie suggested that the NRC accepts the GM diesel quality without adequate proof. G. Zech indicated that the NRC inspects the generator manufacturer who assembles the diesel generator using GM's machine. He indicated that his Branch inspects the quality assurance of Fairbanks Morse or Knudsen regarding their inspection of GM's diesel. C. Michelson thought it illogical to inspect the assembler when there is a supplier one tier back in the chain. The Committee discussed the procedures used by the Vendor Inspection Branch in dealing with sole source suppliers.

D. W. Moeller indicated that he needed the answer to a number of points regarding the functioning of the Vendor Inspection Branch.

- System of priorities for determining whom to inspect
- What is learned from inspections to improve the health and safety of the public (feedback loop)
- Measures or indicators of the benefits of the Vendor Inspection Program

G. Zech indicated that the priority question is a difficult one and the Program Coordination Section has the responsibility for screening inputs, assessing inspection findings, looking at issues raised by other organizations within the agency, and providing this data as backup for potential decisions. C. Michelson asked if their is enough information available on valves to provide a discussion at another meeting. G. Zeck indicated he would look into that matter.

G. Zech mentioned follow-up of allegations regarding quality assurance programs and materials problems. He indicated that there has been increasing emphasis recently on outage management, including the control of various vendors that the utilities use during outages. He noted that the utilities are increasingly going to commercial grade sources for replacement parts and that there are few vendor suppliers available. G. A. Reed asked for more explanation of the Vendor Inspection Program's involvement with outage management. G. Zech indicated involvement with plants making major modifications from the standpoint of checking

contracting with outside groups, providing specifications to their practices for primary and sub-tier vendors, applying controls that will be exercised during the outage, and procedures and checks that will be performed to bring the plant back on line. G. A. Reed cautioned about overlap in this particular activity with other groups in NRC.

W. Kerr asked if the Vendor Inspection Program has a positive cost-benefit regarding the worth of the resources devoted to it. G. Zech indicated that he was optimistic regarding the contributions of the Program. W. Kerr asked if the NRC Staff should have a QA program that determines the quality of the licensing and regulatory process. G. Zech thought that there was a definite need for such a program, but also that there was a need to assure that there would not be overlapping responsibilities within the Staff.

J. C. Ebersole noted that there appears to be a continuing need to make products cost-effective. This may result in cheaper products. He asked how the Vendor Inspection Program will assure against the diminution in quality. G. Zech indicated that the Branch is looking at the commercial grade issue and attempting to identify where such practices and reductions in quality result in an actual problem in the field. J. C. Ebersole asked what effects standardization will have on the Vendor Program. G. Zech thought that if that point were reached it would be included in future considerations regarding the placement of requirements on fewer companies.

V. Discuss items for the meeting with the Commissioners (Open)

[Note: R. F. Fraley was the Designated Federal Official for this portion of the meeting.]

H. W. Lewis indicated that the ACRS' position regarding an NTSB-type board was stated in 1978 prior to the TMI-2 accident. He explained that if an accident were to occur that was similar to that at TMI-2, the ACRS reserved the perogative to undertake an investigation. He suggested that he was now of a mind to select a few events and do "full-blown" investigations. C. J. Wylie agreed with H. W. Lewis' position. A straw-man statement of the Committee's position on its role in accident investigations was passed around the table (see Appendix VI). G. A. Reed suggested that the fact that previous investigations conducted by the NRC have been less than satisfactory speaks in favor of setting up an Office of Nuclear Safety as proposed by the Brookhaven National Laboratory. F. J. Remick wondered if the ACRS has a legal authority to go to an accident site to interview and to investigate. The Committee acknowledged that there were resource problems mitigating such an effort. H. W. Lewis crystalized the Committee's position by stating that the ACRS still has a mandate to undertake an investigation but not the resources to perform a massive one.

VI. Meeting with the Commissioners (Open)

[Note: The Commissioners present were N. Palladino, Chairman, T. Roberts, J. Asselstine, F. Bernthal and L. Zech]

H. W. Lewis summarized the ACRS' views as expressed in its March 12, 1985 report regarding the new rule on plant-specific backfits. He mentioned that development of the backfit rule was proceeding in tandem with the writing of a draft Manual Chapter on the subject. He thought that these should have been done serially because it is difficult to implement a rule that has not yet been formalized or promulgated. He pointed out that the Committee recommended in its letter that the Commission issue the rule because it thought that plant-specific backfitting regulation can definitely be improved. Although the new rule is in many ways little more than a statement of the old rule 50.109, it would be constructive and useful. He explained that the Committee was not able to conduct an in-depth review of the draft Manual Chapter. On the other hand it found from a cursory review that there were many things that needed to be done to fix the language in the Manual Chapter.

H. W. Lewis indicated that the Committee's letter had several comments which were worth mentioning:

- There is a need for a mechanism to deal with Staff-generated cost-benefit analyses which do not lead to clear-cut decisions
- The Commission should consider going go back to the original definition of backfitting, as published in the earlier version of 10 CFR 50.109
- The Committee has no position regarding inclusion of on-site costs in cost-benefit analyses
- The test of a substantial benefit to the health and safety of the public should not be used to compromise defense-in-depth
- The Commission should encourage decision making at the higher levels of NRC management
- A decision on the backfit question is impossible unless one takes into account costs of all kinds, including onsite costs to the utilities from loss of plant availability, etc.

Chairman Palladino mentioned the question of uncertainties in the data and noted that analyses wouldn't always be conclusive. He suggested that the Staff always will use judgment and these analytical tools as a guide. The analyses do not replace the judgment that eventually has to be made. H. W. Lewis noted that the analysis disciplines the judgment.

Commissioner Asselstine noted that the standard itself drives one away from giving proper consideration to uncertainties when the Staff is forced to make a determination that there is substantial

improvement in overall plant safety. H. W. Lewis pointed out that the rules state that the cost-benefit analysis is not the determinant of whether the backfit is imposed. The rule states that the cost-benefit analysis must be done before the Staff makes its determination of substantial improvement in the health and safety of the public. Except in the rare case where the Staff mandates a backfit, the cost-benefit analysis will be an important piece of data in the determination. Chairman Palladino did not want to see judgment carelessly overriding the benefit derived from a carefully done cost-benefit analysis. Commissioner Asselstine thought that having to do the analysis added discipline to the process and provided flexibility in terms of how to use the information from that analysis to make the technical judgment. Chairman Palladino thought it best for the Commissioners to re-read the proposed rule to see that proper analysis and the best information available are required, although judgment in the end will determine what is backfitted. Commissioner Zech thought that the intent of the rule was to bring more discipline to the backfit program although one would still need flexibility since the ultimate call will be largely based on judgment. Chairman Palladino noted that uncertainty pervades the NRC's activities. He thought that ought to be taken into account when making judgments but that it should not throttle the decision making process. Commissioner Asselstine noted the ACRS' suggestion that the Staff do a cost-benefit analysis for post-TMI changes to get a sense both of what the cost and what the actual safety improvement has been. He asked how this would assist the Commission in assessing the value of the backfitting rule. J. C. Ebersole thought it would show the Commission that cost estimates for most of the changes were vastly over-inflated perhaps by a factor of 50. Commissioner Asselstine noted that industry arguments are that cost-estimates are under-inflated. Commissioner Asselstine mentioned the industry's suggestion that the Commission consider a utility's out-of-pocket expenses for downtime in cost-benefit analyses. He thought that the Commission ought to include as a benefit protecting the asset of the plant itself. H. W. Lewis indicated that the ACRS was almost evenly split on that subject. F. J. Remick in answer to Commissioner Asselstine's question indicated that considering averted cost as a benefit in the cost-benefit analysis is not appropriate under the Atomic Energy Act where public health and safety is the issue. It may be appropriate for the EPA to consider it in its overall cost-benefit balance when contemplating a major Federal action.

The Committee discussed the development of costs in a decision of backfitting. H. W. Lewis offered to cite examples of capriciousness in backfitting. Commissioner Asselstine expressed interest in specific examples of capriciousness. C. J. Wylie suggested fire protection as a glaring example. D. A. Ward pointed out that Appendix A, an appendix to a Branch Technical Position and Appendix R, an appendix to a rule, are treated as if they had the same standing as requirements (regulations).

H. W. Lewis indicated that the ACRS position on the subject of an NTSB type board is embodied in its letter dated March 13, 1985. He indicated that the ACRS' involvement in this subject began in 1978 when it wrote a letter to the effect that there was no need for an independent organization to review reactor accidents for several reasons. Besides the fact that no large accidents had occurred, except for Browns Ferry, the ACRS thought it had a mandate to make a full investigation itself when considered appropriate. On April 11, 1984, however, the Committee wrote a letter recommending that AEOD be elevated to the status of a Commission level office. That recommendation has been dropped in the context of our more recent considerations. He mentioned the Authorization Act that led to the Brookhaven National Laboratory Report on the advisability of an independent agency. The Brookhaven report recommended not that there be a outside agency to investigate reactor accidents with the broad charter of an NTSB in transportation accidents, but that an office be established within the agency named the Office of Nuclear Safety. He indicated that the ACRS supports the Brookhaven study in the final analysis. He suggested that the key to the ability of such an Office to investigate an accident in depth is through use of the "party" system currently employed by NTSB. These would be outside individuals from the surrounding professional community with expertise on the subjects involved in the accident, people chosen for their expertise, not their institutional affiliation. He reviewed six independent ACRS comments noting that three members believe that the current investigating mechanism needs improvement but that there is no need for a new office, an office that would impede the regulatory stability that is most desperately needed at this time. Three other members agreed not only that a new office is needed but that it should be thoroughly independent of NRC along the lines of the NTSB.

D. A. Ward expressed concern whether the nuclear industry can survive another major perturbation in the licensing process. He thought that, while there are some flaws in the functioning of AEOD, those could be fixed. He stressed that the regulatory process needs stability not another perturbation. Commissioner Asselstine asked for any thoughts on what should be done to improve the present system if the system is inadequate but is not going to be modified along the lines recommended by the Brookhaven report. D. A. Ward thought that AEOD has been handicapped because of the diversion of some of its resources. It could also improve its focus and he thought use of the "party" system by AEOD would help in making it more vigorous and improving its focus. Perhaps it just needs additional resources.

Commissioner Bernthal questioned whether there is an analog between the NTSB and an organization that would be applicable to nuclear power. He wondered how they would function and what level of misoperation would they investigate. H. W. Lewis suggested that they would investigate nuclear incidents on a selective basis. They would have specific criteria and deal with statistical data to some extent as would be their prerogative. He indicated that the NTSB gets to the root causes of an accident by using the "party"

concept; it runs investigations and recruits expertise from outside the organization through the party system. He suggested that AEOD does not investigate accidents. He also indicated that he has not been impressed by the ability or desire on the part of those who do investigate accidents such as I&E and NRR to get to the root cause of the accident. The primary concern of NRC investigations is what regulations have been violated in the course of the accident or as an input to the accident. There is not a great deal of determination to get to the technical or human causes of the accident.

Chairman Palladino suggested that it was his impression that a great deal of effort was expended in trying to get to the root cause of the Browns Ferry fire. He thought that the NRC had gone after the root cause but perhaps not in the most efficient way.

G. A. Reed indicated his support for a new organization basically because of the conflict of interest within the NRC. He thought there was no other way to attract the level of operational expertise necessary for the evaluation of a severe accident for root causes. He noted that the ACRS letter hinted at this when it suggested that success or failure of the Office will depend heavily on the quality of people attracted to serve in it. He suggested that a nuclear NTSB could get much closer to real root causes of accidents with the competence and objectivity of experts in the workplace such as modified FAA designated representative individuals. The industry would begin to experience better operational and technical feedback and would move toward realization of a party system. The maintenance of an up-to-date competent organization for accident evaluation has to start with a solid base and the acquisition of quality people for the appropriate checks and balances and disciplines necessary for the time when an investigation is triggered.

Commissioner Asselstine asked C. Michelson, a former Director of AEOD, if an internal NRC office which reported to the Commission directly could exercise the kind of independence and critical review of operating events, accident percursors, and actual accident situations that is needed to get to root causes and to make recommendations for change. C. Michelson suggested that it would be possible to make such an organization work at any level in the NRC. It would of course get more immediate attention if it were at a higher level. He did agree with H. W. Lewis that it would be quite important that any redefining of responsibilities be done by a group of individuals who do not already have a vested interest in the allocation of the responsibilities. He indicated his support for elevating AEOD to give it additional and appropriate stature and independence. It would then be in a better position to make its resource requirements known. He also indicated his support for the present ACRS letter, but thought that any new organization should not be a separate agency of the government, but within the NRC. He thought it would be very difficult to create and staff as an independent agency properly.

concept; it runs investigations and recruits expertise from outside the organization through the party system. He suggested that AEOD does not investigate accidents. He also indicated that he has not been impressed by the ability or desire on the part of those who do investigate accidents such as I&E and NRR to get to the root cause of the accident. The primary concern of NRC investigations is what regulations have been violated in the course of the accident or as an input to the accident. There is not a great deal of determination to get to the technical or human causes of the accident.

Chairman Palladino suggested that it was his impression that a great deal of effort was expended in trying to get to the root cause of the Browns Ferry fire. He thought that the NRC had gone after the root cause but perhaps not in the most efficient way.

G. A. Reed indicated his support for a new organization basically because of the conflict of interest within the NRC. He thought there was no other way to attract the level of operational expertise necessary for the evaluation of a severe accident for root causes. He noted that the ACRS letter hinted at this when it suggested that success or failure of the Office will depend heavily on the quality of people attracted to serve in it. He suggested that a nuclear NTSB could get much closer to real root causes of accidents with the competence and objectivity of experts in the workplace such as modified FAA designated representative individuals. The industry would begin to experience better operational and technical feedback and would move toward realization of a party system. The maintenance of an up-to-date competent organization for accident evaluation has to start with a solid base and the acquisition of quality people for the appropriate checks and balances and disciplines necessary for the time when an investigation is triggered.

Commissioner Asselstine asked C. Michelson, a former Director of AEOD, if an internal NRC office which reported to the Commission directly could exercise the kind of independence and critical review of operating events, accident percursors, and actual accident situations that is needed to get to root causes and to make recommendations for change. C. Michelson suggested that it would be possible to make such an organization work at any level in the NRC. It would of course get more immediate attention if it were at a higher level. He did agree with H. W. Lewis that it would be quite important that any redefining of responsibilities be done by a group of individuals who do not already have a vested interest in the allocation of the responsibilities. He indicated his support for elevating AEOD to give it additional and appropriate stature and independence. It would then be in a better position to make its resource requirements known. He also indicated his support for the present ACRS letter, but thought that any new organization should not be a separate agency of the government, but within the NRC. He thought it would be very difficult to create and staff as an independent agency properly.

Commissioner Asselstine asked if the Committee's position was to leave AEOD essentially in place and build a new organization either as a Commission level office or an independent office. H. W. Lewis indicated that he thought the Committee's position was that one should not do this by a paper exercise simply through renaming AEOD. He suggested that a study group work up detailed planning as to appropriate functions for the ONS and make a recommendation to the Commission. Commissioner Bernthal suggested that he was now in favor of using AEOD as a nucleus for a nonpaper-exercise reorganization adding the authority they would need for investigations. This appeared to him to be a logical extension under the NRC that might be an organizational and administrational improvement. H. W. Lewis indicated that the Committee did not recommend that the Commission elevate AEOD and give it investigatory authority. Commissioner Bernthal suggested that the Committee did not recommend against that. Commission Asselstine recognized the broader ACRS position and indicated he was in support of that position. Commissioner Roberts indicated that he was not in favor of setting up a new organization.

M. W. Carbon indicated that he thought there was need for improvement in the area of accident investigation. Nevertheless, he thought it too large a perturbation to set up an outside agency and he thought that it was not necessary to set up a new office within the NRC. He indicated support for elevating AEOD to Commission level but personally did not think of AEOD as being the NTSB-type investigatory group within NRC. He thought that AEOD might participate as a member of a group investigating a nuclear event but thought AEOD should not be the leader or the crux of the group that carries out the investigation. P. G. Shewmon thought it very important that, regardless of the form of the organization, one must incorporate industrial expertise to balance against the adversarial relationship attendant when only NRC people conduct an investigation. M. W. Carbon stressed that the NRC ought to have a contingency plan in existence should it be called to carry out a new investigation of a significant accident. There ought to be a very firm plan for exactly how one would conduct such an investigation.

C. J. Wylie suggested that the inclusion of the "party" system to obtain the help of experts in the industry is a powerful concept. He thought the use of a designated representative approach would help to get to the root causes of an event and would be a step in the direction of self-regulation, an issue that has been proposed. It would also tend to reduce the adversarial relationship between industry and the NRC. C. J. Wylie noted that the root cause of the Salem event was not correctly determined by the NRC Staff. The Staff stated that the cause of the accident was poor maintenance. The real cause was poor design to begin with of using an undervoltage device on a breaker for trip function when it is known by those in the industry that the undervoltage device is just an accessory to the breaker. The breaker would normally be shunt-tripped anyway and the UV device is not a very reliable method of operation. Also it was found that the breakers were not

very well manufactured. Commissioner Asselstine agreed that the Staff did not get at the root cause.

Commissioner Bernthal asked if the ACRS itself could take on some, if not the lead responsibility, in accident investigation. H. W. Lewis noted that while in 1978 the ACRS thought that it had a mandate to investigate a major accident it now believes that, while it still has the mandate, it has neither the resources nor the expertise to conduct a major accident investigation of the kind the NTSB does. Of course this does not preclude the Committee from looking at some aspects of an event.

Discussion of the ACRS role in civilian radwaste program was deferred as a topic of discussion to a special meeting with the Commissioners during the ACRS 301st meeting in May 1985.

VII. Long Range Activities of the NRC (Open)

[Note: R. K. Major was the Designated Federal Official for this portion of the meeting.]

M. W. Carbon indicated that the ACRS decided at its Harpers Ferry retreat in November 1984 to offer recommendations to the Commissioners on long-range planning (LRP) for the NRC. To this effect, a Long-range Planning Subcommittee was set up at the February 1985 meeting composed of H. W. Lewis, D. W. Moeller, F. J. Remick, C. P. Siess, C. J. Wylie and M. W. Carbon as Chairman. It's stated task was "to assess the need for a plan to deal with the technical issues related to nuclear power plant safety and safety regulation over the next 5 to 10 years" (see Appendix VII). He mentioned that subcommittee meetings were held on March 1, and April 5, 1985.

M. W. Carbon mentioned the need for the long-range plan noting that the NRC does not have one at present. He indicated that conditions are continually changing and a long-range plan would help the NRC focus its efforts. He noted that NRC actions have a large influence on the nuclear industry and the public interest. He explained that Chairman Palladino also requested that the Office of Policy Evaluation (OPE) develop a Five Year Plan. He presented a preliminary draft outline put forward by OPE to cover the areas of safety related activities, regulatory improvements and waste management activities as well as to consider organizational changes.

M. W. Carbon discussed a list compiled by the subcommittee of what the subcommittee thought should be the primary goals of the NRC. He defended the scope of the long-range plan indicating that it should emphasize the need for changes not currently being made and address all suggestions primarily to the Commissioners. F. J. Remick thought that the long-range plan should exclude materials licensing as well as the area of waste management and nonpower reactors. G. A. Reed objected because he thought that waste

management was closely coupled to nuclear power plants and should be included.

M. W. Carbon explained the Subcommittee's approach to the development of an LRP. He indicated that the Subcommittee's first task would be to code a list of specific issues to tentatively define the content of the LRP. The Subcommittee would seek full Committee input and guidance in this effort and invite selected individuals to comment on categorized issues.

M. W. Carbon presented a list of technical issues and regulatory processes culled from discussions during the two Subcommittee meetings. The list of technical issues was the following:

1. Simplification (regulatory requirements)
2. Safety philosphy (defense-in-depth and transition from deterministic to probabilistic regulation)
3. Quality assurance
4. Unquantified conservatism
5. Appropriate level of safety
6. Automation of nuclear power plant operation
7. Safety research
8. Standardization

D. Okrent noted that there was a good bit of overlap in the list. Issues dealing with regulatory processes were the following:

1. Backfitting
2. Performance versus a prescriptive approach to regulation
3. Adversarial relationships
4. NRC personnel and organization (change in the relationship between NRR and I&E)
5. Operator personnel and organization
6. Licensee responsibility (should NRC license everything?)
7. International safety
8. Early site approval and a combined CP-OL License

W. Kerr noted that his State of Nuclear Power Subcommittee scope is subsumed in the LRP Subcommittee. He suggested that perhaps that Subcommittee should act as consultants to the LRP Subcommittee. D.

Okrent was not sure that this incomplete list (which should include decommissioning) will jell into an LRP. He though the references were not sufficient in breadth and that the NRC Staff should be neutral in discussions on the LRP and not act as an adversary. R. Axtmann thought that parallel studies by ACRS and OPE on an LRP would be a misuse of Commission resources.

M. W. Carbon indicated that the Subcommittee plans to present a report to the full Committee by October 1985. He expected that there would be annual updates to the LRP. D. Okrent was still skeptical of how the ACRS could develop a plan from the list of issues. W. Kerr reminded the Committee that repeated safety research reports had a negligible impact on the NRC Safety Research Program. He wondered whether the LRP would meet the same fate. He thought the Committee should think about the effectiveness of past Safety Research report work. R. F. Fraley suggested that the Subcommittee should consider NRC's Program Planning Document (PPG).

VIII. ATWS Rule Status and Nuclear Power Plant Scram Systems (Open)

[Note: P. A. Boehnert was the Designated Federal Official for this portion of the meeting.]

W. Kerr indicated that a combined meeting of the ATWS and Electrical Systems Subcommittees was held on March 15, 1985 regarding the ATWS rule implementation effort. He recalled the publication of the final ATWS rule in the Federal Register of June 26, 1984, which required CE & B&W plants to have diverse scram logic. He indicated that the issue of diverse scram logic for Westinghouse plants was left open. The Staff, subsequently influenced to some extent by the Salem event, recommended to the Commission that the rule be amended to require diverse scram logic for Westinghouse plants. In December 1984 the Commission rejected this recommendation. J. C. Ebersole suggested that scram diversity for Westinghouse plants could be bought at insignificant costs by relying on interruption of the motor generator excitation current exclusive of the breakers.

W. Kerr indicated that the Staff did not recommend that the additional scram logic required to make the CE and B&W logic systems diverse be safety grade. The Commission, however, at the time of issuance of the final rule, directed the Staff to formulate and issue QA guidance for the "nonsafety" equipment encompassed by the ATWS rule. The draft version issued by the Staff suggests that the licensee follow the procedures of 10 CFR Part 50, Appendix B but does not require the recordkeeping and detailed compliance required by Appendix B.

W. Kerr suggested that diversity prevents common cause failures. He thought that some members might be confused by the definition of diversity as the Staff uses it. D. Okrent asked why the loss of auxiliary feedwater plays such a vital role in ATWS mitigation since auxiliary feedwater supplies only 20 percent of the water needed to remove decay heat at full power. He suggested that a

pressure peak will occur in about two minutes after such a transient with or without auxiliary feedwater present.

C. J. Wylie noted that scram breakers are not designed to the same quality as the rest of the reactor protection system. J. C. Ebersole noted that breakers are delicate and their performance is highly dependent on proper maintenance (lubrication requirements). H. W. Lewis agreed but thought that the move to solid state scram systems will expose a new set of common mode failures because solid state circuits have internal failure modes. He thought that well-maintained scram breakers were the answer. C. J. Wylie thought that all that would be needed is a diverse means to interrupt power. W. Kerr thought that new nuclear plants ought to be designed to ride out an ATWS. D. Okrent agreed with W. Kerr that new plants ought to be able to ride out an ATWS or a low probability loss-of-coolant accident. He noted that there are still questions regarding the ability of operators of a BWR to make the right decision regarding maintaining reactor vessel level. There are also questions regarding power oscillations. W. Kerr indicated that one would get oscillations but there is question of how large these oscillations would be. D. Okrent also noted that the Staff has never linked seismic events with an ATWS.

W. Kerr indicated that he intended to schedule in about six months another subcommittee meeting regarding ATWS rule implementation.

C. P. Siess asked whether the Committee intends to suggest changes in the complement of safety relief valves. D. Okrent thought that fewer safety relief valves (SRV) means a greater load on the remaining SRVs and a greater probability of those remaining sticking open. G. A. Reed and J. C. Ebersole pointed out that for PWRs, the reliability of dropping the control rods into the reactor core is very high. They thought that if the circuitry controlling the rods was made as reliable as the mechanical operation of the control rods, the ATWS issue would disappear for PWRs. D. Okrent noted that the ATWS calculations are usually done without considering complications which occur in the real world. It was noted that a draft letter presented before the Committee recommended that Westinghouse go beyond the requirements imposed on B&W and Combustion Engineering. J. C. Ebersole thought that the Subcommittee ought to write a draft letter for presentation to the Committee which stresses prevention versus mitigation, diversity versus quality assurance, and contains a definition of diversity. A motion was put before the Committee regarding a letter which would ask the Commission to reconsider its decision regarding inclusion of Westinghouse in the diverse scram logic requirement. The voting was inconclusive and it was moved that a letter on the issue be considered on Saturday.

IX. Management and Disposal of Radioactive Waste (Open)

[O. S. Merrill was the Designated Federal Official for this portion of the meeting.]

D. W. Moeller explained that during the 299th meeting the Committee considered a proposed letter to Chairman Palladino on the ACRS role in the civilian high-level radioactive waste program, discussing the extent to which ACRS should participate in DOE and NRC activities regarding the high-level waste repository. He indicated that of import are those actions which should be considered by the full Committee and those which can be considered by the Waste Management Subcommittee, itself. He mentioned possible use of the Nuclear Waste Fund for funding NRC's participation in the DOE high-level waste project. Hudson Ragan, Office of the Executive Legal Director, indicated that the Waste Fund was funded by a 1 mil per kwh generated cost on nuclear utilities. He questioned whether NRC could legally take money from that fund. There are no legal means to do so, but there is also no prohibition. He indicated that the case is weak on legal grounds. He suggested that the NRC cannot charge DOE a licensing fee since one Federal agency cannot charge a fee to another Federal agency. From a policy point of view there is a conflict of interest with the Secretary of Energy controlling the funding of NRC waste activities. He saw substantial resistance from utilities at having another demand on the Fund. He did think it was a good idea to have users pay for NRC activities. An objective might be to have the Congress designate a portion of the Nuclear Waste Fund in the U. S. Treasury for use by the NRC. D. W. Moeller thought that NRC would want to maintain its independence and have this funding matter handled outside the Agency.

M. Bell commented on the role of the ACRS in review of the high-level waste management activities. He indicated that the ACRS has the prerogative and has been in the review loop through its Waste Management Subcommittee and consultants. He indicated that his group in waste management has provided D. W. Moeller with a list of particular disciplines necessary for ACRS review. J. C. Mark noted that the ACRS could never cover the entire waste management field without consultants. D. Okrent was resigned to the fact that until the NRC appoints another advisory committee strictly for the matter of waste management, the ACRS will do the job of reviewing high level waste matters one way or another. Chairman Ward mentioned Saturday's planned discussion of ACRS resource allocation. D. W. Moeller agreed to postpone further discussion on the ACRS role until that time. C. P. Siess requested a list of Subcommittee consultants who could better provide oversight.

X. ACRS Subcommittee Activities (Open)

A. Prioritization of An Additional Group of Generic Safety Issues
[Note: S. Duraiswamy was the Designated Federal Official for this portion of the meeting.]

C. P. Siess reported as Chairman of the Generic Items Subcommittee that the full Committee will review the NRC Staff proposed priority rankings for a second batch of new generic safety issues. He reviewed assignments, noting an April 30 deadline for comments by

the subcommittee chairmen, and asked that discussion time be set aside at the May ACRS meeting. C. Michelson noted that the issue of valve reliability will include generic issue 70. W. Minners, NRC, indicated that medium priority items are to be deferred by the Staff because of budget restrictions. He reminded the Committee that a list of schedules for generic issues has just been published in a quarterly summary of the Generic Issue Management System.

B. State of Nuclear Power Safety [Note: A. J. Cappucci was the Designated Federal Official for this portion of the meeting.]

W. Kerr indicated that the Subcommittee on the State of the Nuclear Power Safety met on April 11, 1985 to discuss its charter and future schedules. He requested that members submit examples of serious safety problems and mentioned a memo that he would circulate to that effect. In his later circulated memorandum he requested submission of members' lists by April 29, 1985.

C. Requalification of Nuclear Power Plant Operators

[Note: J. O. Schiffgens was the designated Federal Official for this portion of the meeting.]

D. A. Ward indicated that the ACRS Subcommittee on Human Factors met on April 4, 1985 to discuss operator requalification in terms of questions asked by Commissioner Asselstine during the Committee's meeting with the Commissioners on February 7, 1985. Other purposes of the meeting were to discuss safety performance indicators for nuclear power plants, to discuss a review of Pacific Northwest Laboratory's work for the research Staff on organizational characteristics on safety performance and, in particular, to review the following NUREG reports:

- NUREG/CR-3215, Organizational Analysis and Safety for Utilities with Nuclear Power Plants
- NUREG/CR-3737, An Initial Impirical Analysis of Nuclear Power Plant Organization and its Effect of Safety Performance

D. A. Ward indicated that NUREG/CR-3737 described the following steps:

a. Identify and obtain data on parameters that measure or characterize safe operation of a nuclear power plant,

b. Identify and obtain data on parameters that measure or characterize organizational structure, and

c. Attempt to empirically correlate plant organization with safety performance.

General safety performance indicators were on human error rate, hardware failure rate, regulatory compliance, and plant reliability. Parameters for plant organization would concentrate

on the number of vertical ranks of authority in an organization and the average span of control. He indicated that, with regard to safety indicators, the following patterns were discovered. Plants using many vertical ranks of authority performed less well. Plants with narrow spans of control with a larger ratio of supervisors to subordinates performed less well. Plants with better developed coordination mechanisms across functions tend to perform better. G. A. Reed, another member of the Human Factors Subcommittee, found this organizational effectiveness research to be disconnected.

D. A. Ward mentioned J. MacEvoy's work on power plant safety and performance evaluation. He indicated that J. MacEvoy developed a rather extensive list of vital sign indicators. It was pointed out that changes in such vital sign indicators pointed to the need to look deeper into plant operation. It was indicated that these vital sign indicators applied to both safety and operating performance.

D. A. Ward indicated that the Subcommittee heard many different points of view on the Operator Requalification Program. He mentioned one view that as much as 20 percent of a licensed professional operator's time was devoted to preparing for the annual requalification tests. He noted complaints regarding questions on nuclear physics in the requalifications exams. C. Michelson noted the worst failure rates on the NRC administered tests at 50 to 60 percent for operators who had passed the test once before. D. A. Ward mentioned that the high failure rates were where examiners from outside the nuclear plant were acting as an agent for the NRC. C. J. Wylie thought a high failure case occurred because the operators were seeing a much more difficult upgraded exam. D. A. Ward acknowledged that the Committee ought to provide Commissioner Asselstine an answer to his questions but he did not believe that enough information was obtained at the Subcommittee meeting. F. J. Remick thought that one needs to examine whether an annual requalification exam is the proper interval. He was not sure that this is the time to do anything about requalification since the NRC has recently put out a policy statement indicating it would not undertake a rulemaking in the next two years regarding this matter. Any change in the Requalification Program will have to be through a rulemaking process. He suggested that the Committee not write a letter at the present time.

G. A. Reed found wide contradictions in the effectiveness of the program and thought that the NRC should ease up on its overly rigorous "ground zero" tests. He thought the NRC's priority ought to be remotivation of reactor operators who have particularly low morale at the present time. H. W. Lewis asked how one would motivate reactor operators. G. A. Reed thought the check operator concept would be a starting point. F. J. Remick agreed that these exams do not test the operator's proficiencies. He acknowledged morale problems and the fact that a check operator might produce a better test. C. J. Wylie thought it rather stressful that an operator might be spending 25 to 30 percent of his time studying

for exams, especially since the exams are not operations-oriented. D. Okrent thought that the best idea for the Committee would be to acquire about ten failed exams to go over those specific questions that gave trouble. He thought that one could still use the check operator system but have those performing the examinations be from a plant other than the one where the exams are being administered. M. W. Carbon expressed interest in finding out what was on these exams that caused such a high failure rate.

C. P. Siess suggested that the NRC was performing an oversight function on Licensees by conducting 20 percent of the requalification tests. He indicated that he did not see how the check operator could be a substitute for the NRC. H. W. Lewis thought that the Committee should focus letter writing efforts on three possible issues:

1. Are the license examiners qualified?

2. Are the requalifications exams relevant?

3. Do reactor operators have a morale problem?

D. Emergency Core Cooling Systems [Note: P. A. Boehnert was the Designated Federal Official for this portion of the meeting.]

D. A. Ward indicated that the ECCS Subcommittee met on April 3, 1985 to discuss the following topics.

1. Exxon ECCS evaluation model (EM) errors

2. The Westinghouse BART/BASH ECCS Codes

3. Resolution of TMI Item II.K.3.30 - Revision of Small Break LOCA ECCS Evaluation Models for PWRs

4. Resolution of the reactor coolant pump issue given a small break LOCA

D. A. Ward indicated that Exxon is one of a number of companies that furnish LWR cores and provide Appendix K analyses to certify these new cores. As a result of errors made by Exxon on the thermal hydraulic portion of their reload evaluations, several of their customer plants were not in compliance with Appendix K requirements and faced significant operational restrictions. He indicated that the Exxon calculational models produced modest differences from Westinghouse because of the design of fuel assemblies. Rather small effects have been found which resulted in no power derating except for one plant which was imposed a penalty in peaking factor of about five percent.

D. A. Ward indicated that TMI Action Item II.K.3.30 was an item in NUREG-0737 where a licensee would predict the course of small break LOCA. He indicated that the NRR has essentially concluded its review of the revision of licensee small break LOCA best estimate

evaluation models. Subcommittee members expressed concern that the NRC's review approach was to accept the revision if it was conservative with respect to test data comparison. D. A. Ward indicated that licensees should be striving to update these evaluation models to make them more physically realistic. He indicated that the Staff has taken the Committee's comments under advisement and will report back to the Subcommittee at a later date. J. C. Ebersole noted that Palo Verde has a particular problem with respect to this matter because of its closed primary system. A small break LOCA along with loss of all AC power might produce a disaster since CE plants do not have PORVs.

E. Seismic Design Margins in Nuclear Facilities and Seismic Reevaluation Plan for the Diablo Canyon Nuclear Station [Note: E. G. Igne was the Designated Official for this portion of the meeting.]

C. P. Siess reported that a joint meeting of the ACRS Subcommittees on Diablo Canyon and Extreme External Phenomena was held on March 21, 1985 to hear Pacific Gas and Electric's (PG&E) report on its long-term seismic program and the establishment of a seismology/geology department. He indicated that PG&E proposes to identify, examine, and evaluate all relevant geologic and seismic data to perform the most elaborate seismic PRA to date (see Appendix VIII). The ACRS consultants thought that this work would advance the art of PRA. However, there was concern regarding the fact that the PRA would only be carried out to the core melt damage stage and would not consider off-site consequences. The NRC Staff appears to be willing to be satisfied with a PRA considering only damaged core states. D. Okrent thought the PRA should be carried out to at least the release categories. The Staff is reviewing PG&E's plan, expects to finish its review by July 1, and wishes ACRS concurrence at the July ACRS meeting. C. P. Siess thought that if the Staff wants a letter regarding this matter, the Staff should justify why it is sufficient for the PRA to end at core damage states. D. A. Ward noted that release categories would take into account the condition of the containment.

L. Reiter, NRC, requested copies of the ACRS consultant comments from the March 21 Subcommittee meeting. C. P. Siess agreed to forward the comments.

D. Okrent mentioned that R. Budnitz, NRC consultant, made a presentation on seismic margins and specifically on seismic PRA results (see Appendix IX). The studies indicated high confidence of a low probability of failure. D. Okrent lauded attempts to develop screening criteria. C. P. Siess thought that this was an interesting approach to doing a considerable amount of screening on many nuclear plants for a very small expenditure of funds.

F. Reliability of Emergency Power Supplies Diesel Generator Reliability [Note: R. Savio was the Designated Federal Official for this portion of the meeting.]

W. Kerr indicated that the Electrical Systems Subcommittee held discussions on Friday, April 12, 1985 on the reliability of emergency power supplies. He cited a recent study by the NRC Staff in its technical review of generic issue B-56 "Diesel Reliability" which set a minimum reliability for diesels of 0.95 per demand or greater. Recent data have shown an average of 0.98 reliability or a 0.02 failure rate with a range of about 0.9 to 1.0 in reliability. He indicated that the Staff is requesting a technical specification change to eliminate fast starts. He noted that the Staff was also asked if they knew the reasons for differences between diesel generator experience in Japan and the U.S. The Staff indicated that they were still studying the issue.

XI. Executive Sessions (Open)

[Note: R. F. Fraley was the Designated Federal Official for this portion of the meeting.]

A. Subcommittee Assignments

1. Palo Verde Nuclear Plant

The Committee decided to schedule a subcommittee meeting to address the remaining outstanding issues from its report on Palo Verde (dated December 15, 1981) which were only partially discussed in an NRC Staff briefing during the Committee's 292nd ACRS meeting (August 9-11, 1984).

2. Westinghouse Control Rod Scram System Reliability

The members took note of the Commission decision in connection with ATWS to require additional diversity in B&W and CE scram systems but not to impose the same requirement on Westinghouse nuclear plants. The committee deferred specific action on this matter until a combined meeting of the ATWS and Electrical Systems Subcommittees could consider the B & W and CE fixes and possible additional diversity that might be appropriate for Westinghouse nuclear plants. W. Kerr, Chairman of both subcommittees, requested a brief session at the May ACRS meeting to obtain guidance regarding the scope of the subcommittee meeting to consider Westinghouse scram system reliability and the potential for damage to the scram system logic.

3. Requalification of Nuclear Power Plant Operators

The Committee has assigned its Subcommittee on Human Factors to perform an indepth examination of the operator requalification program pursuant to the request by Commissioner Asselstine at the February 8, 1985 ACRS meeting with the Commissioners. ACRS Executive Director, R. F. Fraley, has been instructed to inform S. J. Chilk,

Secretary, that such an indepth review will take several months to complete.

4. GESSAR Sabotage Consideration

The issue of sabotage with regard to the General Electric Company GESSAR II standardized nuclear plant was proposed as an item to be discussed at a meeting of the Subcommittee on Safeguards and Security, May 7, 1985.

5. Subcommittee Membership

ACRS Chairman, D. A. Ward, indicated that some time would be set aside at the 301st ACRS Meeting (May 7-9, 1985) to discuss what the Committee expects from its subcommittees and wants in the way of subcommittee composition. See D. A. Ward memo to ACRS Members dated April 11, 1985 (see Appendix X).

6. ACRS Procedures and Administration Subcommittee Meeting on April 9, 1985

The Committee discussed proposed guidelines regarding the basis for apparent conflict of interest limitations to the activities of ACRS members and found that they were reasonably satisfied with them. T. G. McCreless, ACRS Assistant Executive Director for Technical Activities, presented a flowchart of the conduct of members and the availability of ACRS Staff support. Several members asked that the schematic be modified to more properly represent the case of an individual member who wishes to freely express his personal opinion. It was decided that a member can voice his views to the Commissioners as long as other Committee members have an opportunity to express their specific views. Although members are not encouraged to undermine collegial committee decisions, they are at liberty to express with discretion their personal opinions in the course of their activities as professionals. The Committee did not object to a proposed meeting of a small delegation of ACRS representatives with the EDO to discuss the NRC Staff - ACRS interface regarding NRC Staff participation in ACRS subcommittee meetings in the field and the MOU for ACRS participation in the preparation of proposed NRC rules and (technical) policy issues.

The Committee agreed that an effort should be made to concentrate subcommittee meetings during strategic times within each month in an effort to accommodate reductions in ACRS resources for travel. ACRS engineers will be expected to assist in setting priorities for the subcommittee meetings and in decision-making regarding deferral of any low priority meetings. M. Libarkin will

contact Subcommittee Chairmen to discuss the basis for deferral of any proposed subcommittee meetings.

It was further agreed that in order to accommodate manpower reductions in FY 1986-1986, ACRS staff engineers need no longer prepare detailed subcommittee meeting minutes. Summaries of highlights as well as meeting transcripts will be available for use by the members. It was also agreed that ACRS staff engineers should no longer be expected to review and evaluate category B reports. Daily and weekly reports of the NRC staff and LERs submitted by applicants will continue to be available to ACRS members, however, as requested in the procedures for selective distribution of documents.

The ACRS practice of using a one-year "cooling off" period for new members was discussed. It was agreed that this practice will be eliminated.

B. ACRS Reports, Letters, and Memoranda

1. A "Base" Program of NRC Safety Research

The Committee prepared a letter to the EDO regarding the proposal of the RES Staff to justify a "base" program of NRC safety research. Draft 2 of the "NRC Safety Research Program" report, dated December 19, 1984 was reviewed by the ACRS Safety Research Program Subcommittee on April 10, 1985.

2. Severe Accident Policy - Systematic Review of Nuclear Power Plants

The Committee prepared a report to the Commissioners to describe the specific elements for a systematic approach to examination of each nuclear plant now in construction or in operation.

3. ACRS Role in the Civilian Radioactive Waste Management Program

The Committee prepared a report to the Commissioners in which the ACRS considered its role in advising the NRC Staff on matters pertaining to the civilian radioactive waste management program.

4. ACRS Comments on NRC Programs for the Quantification of Seismic Design Margins

The Committee prepared a letter to the EDO regarding a briefing by the NRC Staff and its Expert Panel at a meeting of the ACRS Subcommittee on Extreme External

Phenomena held March 21, 1985 concerning the proposed approach to the quantification of seismic margins.

5. Notification of NRC of Significant Results Arising from Industry - Sponsored PRAs

The Committee prepared a letter to the EDO inquiring how the ACRS can gain access to industry-sponsored PRAs without discouraging the initiative on the part of industry in undertaking such PRAs (full or partial scope). The ACRS is interested in learning how significant safety insights resulting from such licensee-initiated PRAs are made available to the NRC and to the industry, in general, and if there are any NRC criteria on what is reportable.

6. Reply to the Honorable Morris K. Udall

The Committee prepared a report to the Honorable Morris K. Udall, Chairman, Committee on Interior and Insular Affairs, U.S. House of Representatives, transmitting ACRS views and the views of individual members regarding the NRC budget request for Fiscal Years 1986-1987 and specifically the NRC Safety Research Program and budget proposed for FY 1986. (see Appendix XI).

C. Generic Issues

1. Proposed Regulatory Policy for Advanced Reactors

The Committee prepared a memorandum to J. E. Zerbe, Director, Office of Policy Evaluation (OPE), that states that the ACRS prefers to defer review of the proposed policy for regulation of advanced nuclear power plants (SECY-84-453A) until after the public comments have been received and addressed by OPE Staff and after a revised version of the proposed policy has been prepared. The Committee anticipates that its review will require about two months after the modified draft of the policy statement is received.

D. Future Schedule

1. Future Agenda

The Committee agreed on tentative agenda items for the 301st ACRS Meeting, May 9-11, 1985 (See Appendix II).

2. Future Subcommittee Activities

A schedule of future Subcommittee activities was distributed to Members (see Appendix III).

E. IAEA Assignment

C. Michelson informed the Committee that he had been asked to undertake a two month mission in Indonesia for the IAEA. He expects to leave May 20 and assumes that the assignment involves reactor safety issues. In order to avoid any apparent conflict of interest be will be on leave without pay for the two months and will not do any ACRS or government work during that time.

F. Proposed ACRS Report Concerning the Diablo Canyon Transcripts

H. W. Lewis introduced a draft report regarding the leaked transcript of the Commission's pre-decisional closed meeting on Diablo Canyon. The Commission was advised by Counsel that it was improper for the Commission to use information on the probability of an earthquake at Diablo Canyon because it did not appear in the hearing record. The Committee decided that the matter was more of a legal than technical issue and it was not appropriate for the ACRS to take a position. The Committee informed H. W. Lewis that he was free to state his own position as a member of the public.

G. Professional Reactor Operators Society Talk

G. A. Reed requested ACRS guidance regarding an invitation for him to speak before the Professional Reactor Operators Society (PROS) about requalification of nuclear power plant operators. He was advised to say that the ACRS is currently reviewing this subject but has not formulated a consensus position and that he could express his personal views freely.

The 300th ACRS Meeting was adjourned at 3:00 p.m., Saturday, April 13, 1985.

APPENDIXES
TO
MINUTES OF THE 300TH ACRS MEETING
APRIL 11-13, 1985

ACRS-2305

APPENDIX I
LIST OF ATTENDEES

ATTENDEES
300TH ACRS MEETING
APRIL 11-13, 1985

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

David A. Ward, Chairman
Harold W. Lewis, Vice-Chairman
Robert C. Axtmann
Max W. Carbon
Jesse C. Ebersole
William Kerr
Carson Mark
Carlyle Michelson
Dade W. Moeller
David Okrent
Glenn A. Reed
Forrest J. Remick
Paul G. Shewmon
Chester P. Siess
Charles J. Wylie

ACRS Staff

Raymond F. Fraley, Executive Director
M. Norman Schwartz, Technical Secretary
Herman Alderman
Paul A. Boehnert
Anthony J. Cappucci
Robert Cushman
Sam Duraiswamy
Medhat M. El-Zeftawy
John Flack
John T. Gilbert
Elpidio G. Igne
Janet Kotra
Morton W. Libarkin
Richard K. Major
John A. MacEvoy
Thomas G. McCreless
John C. McKinley
Owen S. Merrill
Austin Newsom
Gary R. Quittschreiber
Richard Savio
Stanley Schofer

NRC STAFF ATTENDEES

300TH ACRS MEETING

April 11-13, 1985

Thursday, April 11, 1985

NUCLEAR REACTOR REGULATION

R. Hernan

Friday, April 12, 1985

NUCLEAR REACTOR REGULATION

C. O. Thomas
D. Scaletti
M. Rubin
T. Dunning
B. Boger

R. Hernan

NUCLEAR MATERIAL SAFETY & SAFEGUARDS

T. Allen

APPLICANT ATTENDEES

300TH ACRS MEETING

April 11-13, 1985

Friday, April 12, 1985

GENERAL ELECTRIC

W. D. Gilbert
D. Foreman
R. Villa
J. E. Maxwell

SANDIA NATIONAL LABS

D. M. Eriscon, Jr.

PUBLIC ATTENDEES

300TH ACRS MEETING

April 11-13, 1985

Thursday, April 11, 1985

P. C. Carr, Bechtel Poer Corporation
T. Mraamato, Chubu, EPL
H. Brooks, Howard University
L. Connor, DSA
J. Nurmi, EPM
C. Brinkman, Combustion Engineering
P. Bangser, Shaw Pittman
A. J. Pressesky, American Nuclear Society
R. E. Schaffstall, KMC
J. Bargler, Pacific Gas & Electric
M. Gruenberg, Ottaway News Service
N. Numark, IEAL
W. Y. Kato,BNL
C. O. Miller, System Safety
R. A. Green, NJ-BRP
M. K. O'Mealia, DSA
S. Niemczyk, EPI
K. Cooper, Borson-Marsteller
D. J. Donoghue, Stone & Webster
P. Docherty, Westinghouse
J. Harris, Stone & Webster Engr. Corporation
C. Baldwin, EPM
J. Chivers, Doub & Muntzing

INVITED ATTENDEES

300TH ACRS MEETING

Thursday, April 11, 1985

R. Wilson, Harvard University
Araj , Harvard University

PUBLIC ATTENDEES
300TH ACRS MEETING
April 11-13, 1985

Friday, April 12, 1985

R. Bradbury, Stone & Webster
Gipay, Bechtel
T. C. Houghton, KMC
J. Nurmi, EPM
P. Docherty, Westinghouse
C. Betts, Gasser Associates
H. M. Fontecilla, Virginia Power
J. E. McEwen, Jr., TSI
R. Huston, Delian
J. Burgler, Pacific Gas & Electric
V. Schiffgens, Self
J. Silyex Paul, Self
K. Schiffgens, Self
K. Docherty, Westinghouse

5

APPENDIX A
FUTURE AGENDA

MAY ACRS MEETING

| | |
|---|---|
| • Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licenses -- ACRS comments | 2 hrs |
| • GESSAR II -- ACRS report on NUREG-0979 | 4 hrs |
| • Consideration of earthquakes in emergency planning -- ACRS comments | |
| • Quantitative Safety Goals -- ACRS comments on NRC Staff evaluation of two-year trial period of quantitative safety goals | tentative |
| • Safeguards and Security at Nuclear Power Plants | 2 ½ hr |
| • ACRS Safety Research Report -- Discuss action plant for ACRS review of the proposed NRC Safety Research Budget and Program for FY 1987 | ½ hr |
| • EPA Standards Regarding Radwaste -- Releases from geologic repositories | 2 hrs |
| • Recent events at operating nuclear plants | 1½ hrs |
| • Prioritization of a new batch of Generic Safety Issues | 1 hr |
| • Emergency Core Cooling Systems report of May 1, 1985 subcommittee meeting regarding hydrodynamic loads in GE BWR Mark I, II, and III containments and the USI issue regarding the effects of insulation debris on post-LOCA containment sump performance (DAW/PAB) | |
| • Palo Verde Nuclear Plant - Subcommittee report regarding the resolution of remaining issues | 1 hr |
| • Scram System Reliability at Westinghouse Nuclear Plants | ½ hr |
| • Meeting with Commissioners to discuss the ACRS role in the civilian radwaste program and the GESSAR II standardized nuclear plant design | 1 hr |
| • Report by G. A. Reed of the proposed recommendations of the NRC Working Group on technical specification simplification | ½ hr |
| • Regulatory activities for advanced reactors | 1 hr |

JUNE ACRS MEETING

- Regulatory Guide 1.99, Rev. 2, Effects of Residual Elements on Predicted Radiation Damage to Reactor Pressure Vessels -- ACRS comments
- Beaver Valley Unit 2 -- OL review
- San Onofre Unit 1 -- ACRS comments on the IPSAR review
- Recent Events at Operating Plants
- Maintenance and Surveillance Program Plan -- ACRS comments regarding proposed NRC plan for improved maintenance programs at nuclear power stations
- NRC Regulatory Guide revisions for containment leak rate testing and Appendix J of 10 CFR Part 50

JULY ACRS MEETING

- Nuclear Source Term -- ACRS review of NUREG-0956, use of source term in regulatory activities
- Pipe Cracking in BWRs -- ACRS comments on NUREG-0312, Rev. 2
- Proposed NRC Rule to Define "Items Important to Safety"
- Long Term Seismic Program -- Seismic Reevaluation Plan for Diablo Canyon Nuclear Station

REVISED 4/13/85

## SCHEDULE OF ACRS SUBCOMMITTEE MEETINGS

APRIL

17
(Closed)

Joint Reactor Operations and Human Factors (Atlanta, GA) (Major) - Ebersole, Ward, Kerr, Lewis, Michelson, Reed, Remick, Wylie. Purpose: To discuss INPO's evaluation of nuclear plant operations and incidents/accidents -- briefing by INPO representatives.

23

Reliability Assurance (Major) - Michelson, Ebersole, Kerr, Reed, Ward, Wylie. Purpose: To continue discussion from the March 19 meeting regarding methods to enhance the reliability of air- and motor-operated valves.

26
(meeting A.M.)
(site visit P.M.)

Palo Verde (Phoenix, AZ) (Wang) - Ebersole, Lewis, Reed, Wylie. Purpose: To review the final reports for various construction deficiencies and the results of the preoperational testing as requested in ACRS letter dated December 15, 1981.

MAY

1

Joint Fluid Dynamics and ECCS (Boehnert) - Ward, Ebersole, Etherington, Michelson. Purpose: To: (1) review the status of the resolution hydrodynamics loads issue for GE BWR Mark I-III containments; (2) continue the discussion of C. Michelson's concerns regarding the USI A-43 issue relating to the effects of insulation debris on containment sump performance post-LOCA; (3) hear a presentation on the status of the RES-sponsored program to develop a plant analyzer; (4) continue discussion of NRR ECCS-related matters previously reviewed by the Subcommittee; and (5) review the resolution of the RCP trip issues given a small break LOCA.

2

Class 9 Accidents (Wang) - Kerr, Axtmann, Shewmon, Siess, Ward. Purpose: To be briefed by RES on the draft NUREG-0956, "Source Term Reassessment."

2 & 3

Joint Waste Management and Site Evaluation (Merrill) - Moeller, Axtmann, Ebersole, Mark. Purpose: To review the: EPA Standards for HLW Repository; (2) consideration of earthquakes in emergency preparedness; and (3) proposed rule on emergency preparedness for fuel cycle and other radioactive material licensees.

6
(1:00 P.M.)

Reactor Operations (Alderman) - Ebersole, Kerr, Michelson, Moeller, Reed, Remick, Ward. Purpose: To discuss recent operating occurrences.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETINGS

MAY (CONT'D)

7 — Safeguards & Security (Schiffgens) - Mark, Carbon, Ebersole, Michelson, Reed, Siess, Wylie. Purpose: To review the potential consequences of sabotage at nonpower reactors, to be briefed by NMSS on sabotage protection at power reactors, and to hear how the NRC Staff reviews and evaluates licensees' security plans.

8 (8:30a - 3:00p) — Safety Research Program (Duraiswamy) - Siess, Carbon, Kerr, Mark, Michelson, Moeller, Okrent, Remick, Shewmon (p.m. only), Ward. Purpose: To discuss the proposed NRC Safety Research Program and budget for FY 1987 and to gather information for use by the ACRS in its preparation of the annual report to the Commission on the NRC Safety Research Program.

8 (3:00 P.M.) — Safety Philosophy, Technology, and Criteria (Savio) - Okrent, Ebersole, Kerr, Lewis, Michelson, Remick, Ward, Wylie. Purpose: To review the status of the NRC Staff's evaluation of the trial use of the Commission's proposed Safety Goal Policy.

9 - 11 — 301st ACRS Meeting

~~14 (tent.)~~ 6 — Qualification Program for Safety-Related Equipment (Cappucci) - Wylie, Ebersole, Michelson, Reed, Shewmon, Siess, Ward. Purpose: To discuss RES programs for plant aging and equipment qualification.

15 — San Onofre - SEP (Alderman) - Siess, Ebersole, Moeller. Purpose: To review the Integrated Plant Safety Analysis Report (IPSAR) for San Onofre.

16 — Long Range Plan for NRC - (see attached sheet)

20 - 25 — Meeting with RSK and GPR (Paris, France & Munich, Germany) (McCreless) - Ward, Kerr, Lewis, Mark, Okrent, Reed. Purpose: To discuss current reactor safety problems and philosophy.

23 & 24 — Joint Metal Components and Structural Engineering (Igne) - Shewmon, Siess, Axtmann, Ebersole, Etherington, Michelson. Purpose: To discuss modifications to General Design Criteria-4 that will account for the use of leak-before-break criteria. Other related matters will be discussed at this meeting.

30 (CLOSED) — Decay Heat Removal Systems (Boehnert) - Ward, Ebersole, Etherington, Michelson, Reed. Purpose: To continue the review of NRR resolution position on USI A-45.

31 — State of Nuclear Power Safety (Cappucci) - Kerr, Lewis, Michelson, Okrent, Reed, Shewmon. Purpose: To begin discussions on items selected for review from member lists of reactor safety problems.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETINGS

JUNE

| | |
|---|---|
| 4 (8:45 a.m.) | Regulatory Activities (Duraiswamy) - Siess, Carbon, Kerr, Michelson, Reed, Ward, Wylie. Purpose: To review the: (1) proposed General Revisions to Appendix J to 10 CFR 50, "Leak Tests for Primary and Secondary Containments of Light-Water Cooled Nuclear Power Plants," (2) Draft Regulatory Guide on "Containment Leakage Testing," and (3) Reg. Guide 1.23, Rev. 1, "Meteorological Measurement Programs for Nuclear Power Plants (tent.)." |
| 5 | Safety Research Program (Duraiswamy) - Siess, Carbon, Kerr, Mark, Michelson, Moeller (p.m. only), Okrent, Remick, Shewmon, Ward. Purpose: To discuss the updated information (possibly the Budget Review Group mark) on the proposed NRC Safety Research program budget for FY 1987. Also to discuss a draft ACRS report to the Commission on the NRC Safety Research Program and budget for FY 1987. |
| 6 - 8 | 302nd ACRS Meeting |
| 12 & 13 | ECCS (Alliance, OH) (Boehnert) - Ward, Ebersole, Etherington, Michelson, Reed. Purpose: To continue the review of the joint NRC/B&WOG/EPRI/B&W joint IST Program. A visit to the MIST facility is also planned. |
| 17 | Air Systems (Schiffgens) - Moeller, Mark, Michelson, Ward. Purpose: To review the NRC Staff's Supplement to the Control Room Habitability Working Group Report - June 1984. This Supplement is to discuss the Staff's survey of NTOL and OR control rooms. Also, the Subcommittee will review the Staff's final report on "Safety Implications Associated with In-Plant Pressurized Gas Storage and Distribution Systems in Nuclear Power Plants." |
| ~~18~~ POSTPONED | Joint Reactor Radiological Effects and Fire Protection (Merrill/Alderman) - Moeller, Axtmann, Carbon, Ebersole, Michelson, Reed, Siess, Wylie. Purpose: The use of hydrogen addition in BWRs to inhibit stress corrosion will be reviewed regarding increased N-16 production and fire hazards. |
| 19 | Class 9 Accidents (Wang) - Kerr, Axtmann, Shewmon, Siess, Ward. Purpose: To be briefed by RES on the draft NUREG-0956, "Source Term Reassessment." |
| 20 & 21 | Beaver Valley 2 (Pittsburgh, PA) (Alderman) - Kerr, Axtmann, Ebersole, Shewmon. Purpose: Operating license review for Beaver Valley 2. |

# SCHEDULE OF ACRS SUBCOMMITTEE MEETINGS

JULY

6 Quality Assurance (See page 5)

10 Long Range Plan For NRC (Major) Carbon, Lewis, Moeller, Remick, Siess, Wylie. Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

11 - 18 303rd ACRS Meeting

AUGUST

7 Long Range Plan For NRC (Major) Carbon, Lewis, Moeller, Remick, Siess, Wylie. Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

8 - 10 304th ACRS Meeting

SEPTEMBER

11 Long Range Plan For NRC (Major) Carbon, Lewis, Moeller, Remick, Siess, Wylie. Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

12 - 14 305th ACRS Meeting

OCTOBER

9 Long Range Plan For NRC (Major) Carbon, Lewis, Moeller, Remick, Siess, Wylie. Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

10 - 12 306th ACRS Meeting

## SCHEDULE OF ACRS SUBCOMMITTEE MEETINGS

**DATES TO BE DETERMINED**

(May) (tent.)

Qualification Program for Safety-Related Equipment (Cappucci) - Michelson, Ebersole, Reed, Shewmon, Siess, Ward, Wylie. Purpose: To discuss the NRC Staff's resolution of USI A-46, "Seismic Qualification of Equipment in Operating Plants." Also to discuss valve operability with the NRC Staff and industry.

(May/June) (tent.)

Joint Metal Components and Seismic Design of Piping (Igne) - Shewmon, Axtmann, Etherington, Lewis, Mark, Michelson, Okrent, Siess, Ward. Purpose: To review the NRC Piping Review Committee's overall recommendations on piping system concerns.

(May/June) (tent.)

Seismic Design of Piping (Igne) - Siess, Etherington, Mark, Okrent, Shewmon. Purpose: To review draft reports issued by the NRC Piping Review Committee on dynamic loads and load combinations and seismic design requirements of piping.

(early June)

River Bend 1 & 2 (location to be determined) (Savio) - Okrent, Ebersole, Shewmon. Purpose: To continue the review of Gulf States Utilities' application for an operating license for the River Bend Nuclear Power Plant Units 1 & 2.

~~Date To Be Determined~~ July 6 (prior to July ACRS mtg.)

Quality and Quality Assurance in Design and Construction (Major) - Remick, Michelson, Okrent, Reed, Siess, Ward, Wylie. Purpose: (1) To review the Final Rule on "The Important To Safety Issue, and (2) To be briefed on the "NRC Quality Assurance Program Implementation Plan."

Date To Be Determined (July)

ECCS (Boehnert) - Ward, Ebersole, Etherington, Michelson, Reed. Purpose: To continue the review of the proposed revision to Appendix K.

Date To Be Determined (Summer)

ECCS (Palo Alto, CA) (Boehnert) - Ward, Ebersole, Etherington, Michelson, Reed. Purpose: To continue the review of the joint NRC/B&WOG/EPRI/B&W joint IST Program. A visit is planned to the EPRI Stanford Research Institute facilities supporting this Program.

Date To Be Determined (October)

ATWS (Boehnert) - Kerr, Ebersole, Michelson, Ward. Purpose: To continue the review of the status of ATWS Rule implementation effort and related issues.

SCHEDULE OF ACRS SUBCOMMITTEE MEETINGS

DATES TO BE DETERMINED (CONT'D)

| | |
|---|---|
| Date To Be Determined (Closed) | Human Factors Tour (Russellville, AR) (Schiffgens) - Ward, Lewis, Michelson, Moeller, Reed, Remick, Wylie. Purpose: This will be a tour and examination of ANO-1's emergency procedures (symptom based) and facilities. |
| Date To Be Determined (Closed) | Westinghouse Water Reactors (Cappucci) - Ebersole, Etherington, Michelson, Okrent, Siess, Wylie. Purpose: To begin the PDA review of the Westinghouse Advanced PWR (RESAR SP/90). |
| Date To Be Determined | Joint Reliability & Probabilistic Assessment and Millstone 3 (location to be determined) (Savio/Duraiswamy) - Okrent, Kerr, Ebersole, Lewis, Mark, Michelson, Siess, Ward, Wylie. Purpose: To review the probabilistic risk assessment for Millstone 3. |
| Date To Be Determined | Human Factors (Schiffgens/Flack) - Ward, Lewis, Michelson, Moeller, Reed, Remick, Wylie. Purpose: Qualification and selection testing for nuclear power plant personnel. The Subcommittee will also have the NRC Staff present a status report on implementing requirements for emergency response capabilities (i.e., EOP developments, overall SPDS operability, DCRDR highlights, discussion on ERFs, and implementation of Reg. Guide 1.97. |
| Date To Be Determined | ECCS (Boehnert) - Ward, Ebersole, Etherington, Michelson. Purpose: To review NRC Thermal Hydraulic Research Program with emphasis on the code assessment program. |
| Date To Be Determined | GESSAR II (location to be determined) (Major) - Okrent, Ebersole, Etherington, Mark, Wylie. Purpose: The Subcommittee wil continue its review of GESSAR II for a Final Design Approval applicable to future plants. |

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| APRIL 17, 1985 (CLOSED) | JOINT REACTOR OPERATIONS AND HUMAN FACTORS | (MAJOR) Ebersole, Ward, Kerr, Lewis, Michelson, Reed, Remick, Wylie |

Cons.: Kris Gimmy (SRL)

LOCATION: INPO Offices, 1100 Circle 75 Pkwy, Suite 1500, Atlanta, GA
(404) 953-3600
INPO Contact: Terry Sullivan

BACKGROUND:

Who proposed action: ACRS/INPO

Purpose: To discuss INPO evaluation of nuclear plant operations and incidents/accidents -- briefing by INPO representatives. This briefing was endorsed by the ACRS.

This meeting is expected to be closed due to the privileged and proprietary nature of the information to be discussed.

Other Topics as Desired

- assistance activities
- training and accreditation
- evaluations (simulator, SRO Peer evaluations, corporate, etc.)
- INPO relationship with NRC-NUMARC
- NPRDS
- Human performance evaluation
- INPO international participation program

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

Available background will be sent in a status report (sent April 2, 1985).

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| APRIL 23, 1985 | RELIABILITY ASSURANCE (VALVES) | (MAJOR) Michelson, Ebersole, Kerr, Reed, Ward, Wylie<br><br>Cons.: H. Jones (TVA) |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: ACRS

Purpose: To continue discussion from the March 19, 1985 meeting. Topics of discussion will focus on methods to enhance the reliability of air- and motor-operated valves. Staff, vendor, and utility participation is anticipated.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Status Report will be provided prior to meeting.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| APRIL 26, 1985<br>(Meeting in morning)<br>(Site Visit in afternoon) | PALO VERDE | (WANG) Ebersole, Lewis, Reed, Wylie |

LOCATION: Phoenix, AZ

BACKGROUND:

Who proposed action: ACRS

Purpose: To review the final reports for various construction deficiencies and the results of the preoperational testing as requested in ACRS letter dated December 15, 1981.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be supplied.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| May 1, 1985 | JOINT FLUID DYNAMICS AND ECCS | (BOEHNERT) Ward, Ebersole, Etherington, Michelson |
| | | Cons.: Catton, Schrock, Sullivan, Tien, Theofanous |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: D. Ward

Purpose: (1) Review the status of the resolution of hydrodynamics loads issue for BWR Mark I-III containments; (2) Continue discussion of C. Michelson's concerns regarding USI A-43 issue relating to the effects of insulation debris on containment sump performance post-LOCA; (3) Hear a presentation on the status of the RES-sponsored program to develop a plant analyzer; (4) continue discussion of NRR ECCS-related matters previously reviewed by the Subcommittee; and (5) Review the resolutuion of the RCP trip issues given a small break LOCA.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be provided.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 2, 1985 | CLASS 9 ACCIDENTS | (WANG) Kerr, Axtmann, Shewmon, Siess, Ward |

LOCATION: Washington, DC

BACKGROUND:

Who proposed action: RES Staff

Purpose: To be briefed by RES on the draft NUREG-0956, "Source Term Reassessment."

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. NUREG-0956 (to be provided later).

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 2 & 3, 1985 | JOINT WASTE MANAGEMENT AND SITE EVALUATION | (MERRILL) Moeller, Axtmann, Ebersole, Mark<br><br>Cons.: Carter, Krauskopf, Parker, Steindler |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: D. Moeller

Purpose: To review: (1) EPA Standards for HLW Repository,
(2) Consideration of Earthquakes in Emergency Preparedness; and
(3) Proposed Rule on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. U.S. Environmental Protection Agency, Proposed Rule, 40 CFR Part 191, "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," Federal Register (47FR58196), Vol. 47, No. 250, December 29, 1982, pp. 58196-58206.
2. U.S. Nuclear Regulatory Commission, 10 CFR Part 50, "Emergency Planning and Preparedness for Production and Utilization Facilities," Federal Register (49FR49640), Vol. 49, No. 247, December 21, 1984, pp. 49640-49643.
3. U.S. Nuclear Regulatory Commission, Draft Proposed Rule, 10 CFR Parts 30, 40, and 70, "Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," (attached to a transmittal memorandum to R. F. Fraley from F. P. Gillespie requesting ACRS review of the proposed rule, dated April 5, 1985).

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 6, 1985<br>(1:00 P.M.) | REACTOR OPERATIONS | (ALDERMAN) Ebersole, Kerr, Michelson, Moeller, Reed, Remick, Ward, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: STAFF/ACRS

Purpose: To discuss recent operating occurrences.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Status report to be provided prior to meeting.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 7, 1985 | SAFEGUARDS & SECURITY | (SCHIFFGENS) Mark, Carbon, Ebersole, Michelson, Reed, Siess, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: Okrent, Michelson, Mark

Purpose: To review the potential consequences of sabotage at non-power reactors and to be briefed by NMSS on sabotage protection at power reactors.

NRC definitions of "sabotage," "malicious mischief," and "vandalism."

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

None

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 8, 1985<br>(8:30a - 3:00p) | SAFETY RESEARCH PROGRAM | (DURAISWAMY) Siess, Carbon, Kerr, Mark, Michelson, Moeller, Okrent, Remick, Shewmon(p.m. only) Ward |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: Routine process

Purpose: To discuss the proposed NRC Safety Research Program and budget for FY 1987 and gather information for use by the ACRS in its preparation of the annual report to the Commission on the NRC Safety Research Program and budget.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Proposed NRC Safety Research and budget for FY 1987 (expected to be made available to the ACRS during April 1985).

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 8, 1985<br>(3:00 p.m.) | SAFETY PHILOSOPHY, TECHNOLOGY, AND CRITERIA | (SAVIO) Okrent, Ebersole, Kerr, Lewis, Michelson, Remick, Ward, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRC Staff/Subcommittee

Purpose: To review the status of the NRC Staff's evaluation of the trial use of the Commission's proposed Safety Goal Policy.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. NRC Task Force report on the two-year evaluation of the trial use of the Commission's proposed Safety Goal Policy (expected in early February).
2. Summary of tentative NRC Task Force recommendations on revisions to and future use of the NRC Safety Goal Policy.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 14, 1985 (tent.) | QUALIFICATION PROGRAM FOR SAFETY-RELATED EQUIPMENT | (CAPPUCCI) Wylie, Ebersole, Michelson, Reed, Shewmon, Siess, Ward |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: RES

Purpose: To discuss RES programs for plant aging and equipment qualification.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 15, 1985 | SAN ONOFRE (SEP) | (ALDERMAN) Siess, Ebersole, Moeller |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: C. Siess

Purpose: To review the Integrated Plant Safety Analysis Report (IPSAR) for San Onofre.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Estimated date for IPSAR is April 22, 1985.

## SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 16, 1985<br>8:00 a.m. - 6:30 p.m.) | LONG RANGE PLAN FOR NRC | (RKM) MWC, NL, DWM, CPS, CJW, FJR |

[redacted] INVITED EXPERTS
J. Hendrie (BNL)
W.S Lee (Duke Power)
J Knight (NRC)

LOCATION: WASHINGTON, D.C.

BACKGROUND:

Who proposed action: ACRS SUBCOMMITTEE - Approved and Confirmed by COMMISSION, NRC.

Purpose:

THE PURPOSE OF THIS MEETING WILL BE TO CONTINUE DISCUSSIONS OR DIALOGUE A LONG RANGE PLAN FOR THE NRC. TOPICS UNDER DISCUSSION ARE TECHNICAL AND ADMINISTRATIVE ISSUES RELATED TO THE REGULATION OF NUCLEAR POWER PLANT SAFETY AND SAFETY REGULATORY OVER THE NEXT FIVE TO TEN YEARS. DISCUSSIONS WITH OUTSIDE EXPERTS WILL BEGIN TO SOLICIT VIEWS ON COMPONENTS NECESSARY FOR A LONG RANGE PLAN.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

IT WAS

DR. CARBON'S LATEST REVIEW PLAN FOR THIS EFFORT DATED APRIL 10, 1985 IS AVAILABLE. DISCUSSED DURING THE 300th ACRS MTG.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 20-25, 1985 | DELEGATION TO MEET WITH GPR AND RSK | (McCRELESS) Ward, Kerr, Lewis, Mark, Okrent, Reed |

LOCATION: Paris, France
Munich, Germany

BACKGROUND:

Who proposed action: Invitation from Group Permanent and Reactor Safety Commission

Purpose: To discuss current reactor safety problems and philosophy.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Memo to ACRS from T. G. McCreless dated April 11, 1985 on current status of meetings.

SCHEDULE 0 ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 23 & 24, 1985 | JOINT METAL COMPONENTS AND STRUCTURAL ENGINEERING | (IGNE) Shewmon, Siess, Axtmann, Ebersole, Etherington, Michelson<br><br>Cons.: Bender, Bush, Hutchenson, Rodabaugh |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRR/ACRS

Purpose: To discuss modifications to General Design Criteria-4 that will account for the use of leak-before-break criteria. Other related matters will be discussed at this meeting.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Proposed GDC-4 package has been received and distributed.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| MAY 30, 1985 (CLOSED) | DECAY HEAT REMOVAL SYSTEMS | (BOEHNERT) Ward, Ebersole, Etherington, Michelson, Reed<br><br>Cons.: Catton, Davis |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRR

Purpose: To continue the review of NRR resolution position on USI A-45.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be provided.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| May 31, 1985 | STATE OF NUCLEAR POWER SAFETY | (CAPPUCCI) Kerr, Lewis, Michelson, Okrent, Reed, Shewmon, |

LOCATION:

BACKGROUND:

Who proposed action: W. Kerr

Purpose: To begin discussions on items selected for review from member lists of reactor safety problems.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JUNE 4, 1985 (8:45 a.m.) | REGULATORY ACTIVITIES | (DURAISWAMY) Siess, Carbon, Kerr, Michelson, Reed, Ward, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action:

Purpose: To review the following:

1) Proposed General revisions to Appendix J to 10 CFR 50, "Leak Tests for Primary and Secondary Containments of Light-Water Cooled Nuclear Power Plants;" and

2) Draft Regulatory Guide on "Containment Leakage Testing;" and

3) Regulatory Guide 1.23, Rev. 1, "Meteorological Measurement Programs for Nuclear Power Plants (tent.)."

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

The following are expected to be made available to the ACRS during May 1985:

1. Proposed revisions to Appendix J to 10 CFR 50
2. Draft Regulatory Guide on "Containment Leakage Testing."
3. Regulatory Guide 1.23, Rev. 1, "Meteorological Measurement Programs for Nuclear Power Plants."

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JUNE 5, 1985 | SAFETY RESEARCH PROGRAM | (DURAISWAMY) Siess, Carbon, Kerr, Mark. Michelson, Moeller (p.m. ), Okrent, Remick, Shewmon, Ward |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: Routine process

Purpose: To discuss the updated information (possibly the Budget Review Group mark) on the proposed NRC Safety Research program budget for FY 1987. Also to discuss a draft ACRS report to the Commission on the NRC Safety Research Program and budget for FY 1987.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Updated information on the NRC Safety Research Program and Budget for FY 1987 is expected to be made available to the ACRS during May 1985.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JUNE 12 & 13, 1985 | ECCS | (BOEHNERT) Ward, Ebersole, Etherington, Michelson, Reed<br><br>Cons.: Catton, Sullivan, Schrock, Theofanous, Tien |

LOCATION: ALLIANCE, OH

BACKGROUND:

Who proposed action: NRC

Purpose: To continue the review of the joint NRC/B&WOG/EPRI/B&W joint IST Program. A visit is planned to the MIST facility.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be provided.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JUNE 17, 1985 | AIR SYSTEMS | (SCHIFFGENS) Moeller, Mark, Michelson, Ward |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: ACRS

Purpose: To review the NRC Staff's Supplement to the Control Room Habitability Working Group Report - June 1934. This Supplement is to discuss the Staff's Survey of NTOL and OR control rooms (work contracted to ANL West). Also, the Subcommittee will review the Staff's final report on "Safety Implications Associated with In-Plant Pressurized Gas Storage and Distribution Systems in Nuclear Power Plants" (work contracted to ORNL).

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. The appropriate reports should be supplied to us by early May.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JUNE 18, 1985 (POSTPONED) | JOINT REACTOR RADIOLOGICAL EFFECTS/ FIRE PROTECTION | (MERRILL/ALDERMAN) Moeller, Axtmann, Carbon, Ebersole, Reed, Siess, Wylie, Michelson |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: C. Michelson

Purpose: The use of hydrogen addition in BWRs to inhibit stress corrosion will be reviewed regarding increased N-16 production and fire hazards.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. V. Benaroya will present a paper to the Health Physics Society on May 27, 1985 This will discuss the increase in N-16 due to hydrogen addition. This paper will be used for background material when it is available.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JUNE 19, 1985 | CLASS 9 ACCIDENTS | (WANG) Kerr, Axtmann, Shewmon, Siess, Ward |

LOCATION: Washington, DC

BACKGROUND:

Who proposed action: RES Staff

Purpose: To be briefed by RES on the draft NUREG-0956, "Source Term Reassessment."

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. NUREG-0956 (to be provided later).

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JUNE 20-21, 1985 | BEAVER VALLEY 2 | (ALDERMAN) Kerr, Axtmann, Ebersole, Snewmon |

LOCATION: Pittsburgh, PA (Hilton Hotel - Pittsburgh, PA)

BACKGROUND:

Who proposed action: Kerr

Purpose: Operating license review for Beaver Valley 2.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. SER is scheduled to be released April 26, 1985.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| PRIOR TO JULY FULL ACRS MEETING<br>July 6, 1985 | QUALITY AND QUALITY ASSURANCE IN DESIGN AND CONSTRUCTION | (MAJOR) Remick, Okrent, Reed, Siess, Ward, Wylie, Michelson |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRC/ACRS

Purpose: (1) To review the Final Rule on "The Important to Safety Issue;" and
(2) Briefing on the "NRC Quality Assurance Program Implementation Plan."

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Final version of Rule and Disposition of Public Comments expected prior to meeting.
2. Program Plan is currently available (SECY-85-65).

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| JULY 10, 1985 | LONG RANGE PLAN FOR NRC | (MAJOR) Carbon, Lewis, Moeller, Remick, Siess, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: ACRS/NRC

Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

Status Report will be issued prior to meeting.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| AUGUST 7, 1985 | LONG RANGE PLAN FOR NRC | (MAJOR) Carbon, Lewis, Moeller, Remick, Siess, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: ACRS/NRC

Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

Status Report will be issued prior to meeting.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| SEPTEMBER 11, 1985 | LONG RANGE PLAN FOR NRC | (MAJOR) Carbon, Lewis, Moeller, Remick, Siess, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: ACRS/NRC

Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

Status Report will be issued prior to meeting.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| OCTOBER 9, 1985 | LONG RANGE PLAN FOR NRC | (MAJOR) Carbon, Lewis, Moeller, Remick, Siess, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: ACRS/NRC

Purpose: The Subcommittee will continue discussions on developing a long range plan for the NRC. Topics under discussion are technical and administrative issues related to the regulation of nuclear power plant safety and safety regulation over the next 5 to 10 years.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

Status Report will be issued prior to meeting.

1 of 2

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED (May) (tentative) | QUALIFICATION PROGRAM FOR SAFETY-RELATED EQUIPMENT | (CAPPUCCI) Michelson, Ebersole, Reed, Shewmon, Siess, Ward, Wylie<br><br>Cons.: to be determined |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRC Staff

Purpose: To discuss the NRC Staff resolution of USI A-46, "Seismic Qualification of Equipment in Operating Plants." Also to discuss valve operability with the NRC Staff and industry.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be supplied.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED (May/June) (tentative) | JOINT METAL COMPONENTS AND SEISMIC DESIGN OF PIPING | (IGNE) Shewmon, Axtmann, Etherington, Lewis, Michelson, Okrent, Ward, Siess, Mark<br><br>Cons.: Bender, Pickel, Rodabaugh, B. Thompson, Dilion, Kassner, Bush |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRC Staff

Purpose: To review the NRC Piping Review Committee's overall recommendations on piping system concerns.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. Report of the NRC Piping Review Committee on recommendations on piping, NUREG-1061, Vol. V, (available in May/June)

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED (May/June) (tentative) | SEISMIC DESIGN OF PIPING | (IGNE) Siess, Etherington, Mark, Okrent, Shewmon<br><br>Cons.: Bender, Pickel, Bush |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRC/Siess

Purpose: To review draft reports issued by the NRC Piping Review Committee on dynamic loads and load combinations and seismic design requirements of piping.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. NUREG-1061, Vol. IV, "Evaluation of Other Dynamic Loads and Load Combination," (report published and distributed).
2. NUREG-1061, Vol II, "Review of Seismic Design Requirements for Nuclear Power Plant Piping," (should be available by May/June).

## SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED (early June) | RIVER BEND | (SAVIO) Okrent, Ebersole, Shewmon |

LOCATION: (to be determined)

BACKGROUND:

Who proposed action: D. Okrent

Purpose: To continue the review of Gulf States Utilities' application for an operating license.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. NRC Staff to supply SER Supplement 2 in early March to support the April 10, 1985 Subcommittee meeting and action at the April 11-13, 1985 full Committee meeting.

4b

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED (JULY) | ECCS | (BOEHNERT) Ward, Ebersole, Etherington, Michelson, Reed<br><br>Cons.: Catton, Schrock, Sullivan, Theofanous, Tien |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: NRC/ACRS

Purpose: To continue the review of the proposed revision to Appendix K.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be provided.

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED (Summer) | ECCS | (BOEHNERT) Ward, Ebersole, Etherington, Michelson, Reed<br><br>Cons.: Catton, Sullivan, Schrock, Theofanous, Tien |

LOCATION: PALO ALTO, CA

BACKGROUND:

Who proposed action: EPRI/NRC

Purpose: To continue the review of the joint NRC/B&WOG/EPRI/B&W joint IST Program. A visit is planned to the EPRI Stanford Research Institute facilities supporting this Program.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be provided.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED (OCTOBER) | ATWS | (BOEHNERT) Kerr, Ebersole, Michelson, Ward<br><br>Cons.: Davis, Lee, Lipinski |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: W. Kerr

Purpose: To continue the review of the status of the ATWS Rule implementation effort and related issues.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY: (To be provided in timely fashion.)

1. QA Guidance for nonsafety-related ATWS equipment.

# SCHEDULE OF ACRS SUBCOMMITTEE TOUR

| DATE | SUBCOMMITTEE TOUR | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED | HUMAN FACTORS (CLOSED) | (SCHIFFGENS) Ward, Lewis, Michelson, Moeller, Reed, Remick, Wylie |

LOCATION: ANO-1, Russellville, AR (~50 miles outside of Little Rock, AR)

BACKGROUND:

Who proposed action: Human Factors Subcommittee

Purpose: This will be a tour and examination of ANO-1's emergency procedures (symptom based) and facilities. The Subcommittee wants the opportunity to examine procedures at an operating plant and see how the TMI required backfits such as SPDS interface. Up to a day and a half is expected. ANO-1 is an 850 MWe, B&W PWR.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. One copy of Arkansas Nuclear One, Unit 1 Emergency Operating Procedures is available for your inspection at the ACRS Office (ask Mr. R. Major for them).

## SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED | WESTINGHOUSE WATER REACTORS (CLOSED) | (CAPPUCCI) Ebersole, Etherington, Michelson, Okrent, Siess, Wylie |

LOCATION: Washington, DC

BACKGROUND:

Who proposed action:

Purpose: To begin the PDA review of the Westinghouse Advanced PWR (RESAR SP/90).

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

(To be provided later.)

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED | JOINT RELIABILITY PROBABILISTIC ASSESSMENT AND MILLSTONE 3 | (SAVIO/DURAISWAMY) Okrent, Kerr, Ebersole, Lewis, Mark, Michelson, Siess, Ward, Wylie |

LOCATION: (to be determined)

BACKGROUND:

Who proposed action: Okrent/Kerr

Purpose: To review the Millstone 3 PRA.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. NRC report documenting the results of the NRC/LLNL review of the Millstone 3 PRA.

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED | HUMAN FACTORS | (SCHIFFGENS/FLACK) Ward, Lewis, Michelson, Moeller, Reed, Remick, Wylie |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action:

Purpose: Qualification and selection testing for nuclear power plant personnel. The Subcommittee will also have the NRC Staff present a status report on implementing requirements for emergency response capabilities (i.e., EOP developments, overall SPDS operability, DCRDR highlights, discussion ERFs, and implementation of Reg. Guide 1.97.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED | ECCS | (BOEHNERT) Ward, Ebersole, Etherington, Michelson, |
| | | Cons.: Catton, Schrock, Sullivan, Theofanous, Tien |

LOCATION: WASHINGTON, DC

BACKGROUND:

Who proposed action: D. Ward

Purpose: To review NRC's Thermal Hydraulic Research Program with emphasis on the code assessment program.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

To be provided.

SY

# SCHEDULE OF ACRS SUBCOMMITTEE MEETING

| DATE | SUBCOMMITTEE MEETING | STAFF ENGR. & MEMBERS |
|---|---|---|
| TO BE DETERMINED | GESSAR II | (MAJOR) Okrent, Ebersole, Etherington, Mark, Michelson, Wylie |

LOCATION: To be determined

BACKGROUND:

Who proposed action: NRC Staff/ACRS,

Purpose: The Subcommittee will continue its review of GESSAR II for a Final Design Approval applicable to future plants.

PERTINENT PUBLICATIONS AND THEIR AVAILABILITY:

1. SSER-4 (NUREG-0979) Safety Evaluation Report related to the final design approval of the GESSAR II BWR/6 Nuclear Island Design (expected April 30, 1985).

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DELETION 3

These pages has been deleted because of proprietary information.

# VENDOR PROGRAM BRANCH

## OFFICE OF INSPECTION AND ENFORCEMENT

## PRESENTATION TO THE ACRS

## APRIL 12, 1985

## AGENDA

- HISTORICAL SUMMARY
- BASIC PROGRAM OBJECTIVES
- INSPECTION AUTHORITY
- ORGANIZATION
- CURRENT PROGRAM EFFORTS
- RECENT INSPECTION AREAS
- FUTURE PLANS

## HISTORICAL SUMMARY

- 1982 - EMPHASIS BEGAN TO SHIFT FROM QA PROGRAMMATIC AUDITS TO IMPLEMENTATION INSPECTIONS

- 1984 - VPB FUNCTION TRANSFERRED FROM REGION IV TO HEADQUARTERS

  - NATIONAL PERSPECTIVE
  - ENHANCE INTERACTION AND FEEDBACK
  - CONCENTRATE ON OPERATIONAL SAFETY ISSUES
  - EMPHASIZE LICENSEE RESPONSIBILITY FOR QUALITY OF VENDOR WORK

## BASIC PROGRAM OBJECTIVES

- Conduct Inspections of Both Vendors and Licensees to Determine the Adequacy of Licensee Controls on Vendor Products and Services
- Determine the Cause of Known Vendor Deficiencies and Assess Generic Implications
- Organizations Inspected:
  - NSSSs
  - AEs
  - Vendor suppliers of products and/or services
  - EQ Testing laboratories and facilities
  - Third Party inspection organizations (ASME)
  - Licensees

## INSPECTION AUTHORITY

- 10 CFR Appendix B
- Atomic Energy Act, Section 161
- Energy Reorganization Act, Section 206
- 10 CFR Part 21

## ORGANIZATION

- FY 1985 STAFFING LEVEL - 35
- REACTIVE INSPECTION SECTION
  - MATERIAL MANUFACTUERS/SUPPLIERS
  - COMPONENT AND EQUIPMENT SUPPLIERS
  - ALLEGATION FOLLOWUP
  - VENDOR/LICENSEE INTERFACE
  - GENERIC SAFETY STUDIES
- SPECIAL PROJECTS INSPECTION SECTION
  - AEs AND NSSSs
  - FUEL FABRICATORS
  - SHIPPING/STORAGE CASKS
  - VENDOR/LICENSEE INTERFACE
  - THIRD PARTY INSPECTION ORGANIZATIONS
  - QA TOPICAL REPORT REVIEWS
- EQUIPMENT QUALIFICATION INSPECTION SECTION
  - TESTING LABS AND FACILITIES
  - LICENSEE IMPLEMENTATION OF EQ 50.49 RULE
- PROGRAM COORDINATION SECTION
  - SCREEN INFORMATION INPUTS
  - ASSESS INSPECTION RESULTS
  - COORDINATE INTERFACES WITH OTHER NRC ORGANIZATIONS
  - DEVELOP PROGRAMMATIC GUIDANCE
  - PERFORM GENERIC ASSESSMENTS

## CURRENT PROGRAM EFFORTS

- EMPHASIS ON LICENSEE RESPONSIBILITIES FOR VENDOR PRODUCTS AND SERVICES
  - VENDOR/LICENSEE INTERFACE (GENERIC LETTER 83-28) Salem event
  - INFORMATION NOTICES AND BULLETINS
  - CEO LETTERS
  - ENFORCEMENT ACTIONS
- EMPHASIS ON IMPLEMENTATION AND HARDWARE QUALITY VS. QA PROGRAMMATIC ISSUES
- VENDOR AND LICENSEE INSPECTIONS BASED ON OPERATIONAL SAFETY SIGNIFICANCE - INPUTS INCLUDE:
  - PART 21, 50.55(E) REPORTS
  - ALLEGATIONS
  - LER'S, NPRDS DATA
  - PART 72 REPORTS TO NRC OPS CENTER
  - VENDOR TECH BULLETINS AND SERVICE LETTERS
  - OTHER INSPECTION FINDINGS
- EQUIPMENT QUALIFICATION RELATED INSPECTIONS
- INSPECTION FEEDBACK AND INTERACTION WITH OTHER ORGANIZATIONS

CURRENT PROGRAM EFFORTS (CONTINUED)

- SAFETY REVIEWS OF VENDOR ISSUES
  - CONDUCTED BY DOE CONTRACTORS
  - PROVIDE BASIS FOR VENDOR INSPECTIONS
  - IDENTIFY MAJOR SUPPLIERS
  - ISSUES:
    - DIESEL GENERATORS
    - PUMPS
    - VALVES
    - SNUBBERS
- OTHER CONTRACTOR SUPPORT
  - TECHNICAL EXPERTISE - NDE, WELDING, DIESELS, METALLURGY, CODES
  - PROGRAM DEVELOPMENT

## RECENT INSPECTION AREAS

- MATERIAL SUPPLIERS AND MANUFACTURERS
  - CARDINAL FASTENERS
  - PHOENIX STEEL
  - INTERSTATE STEEL
  - LTV
  - DUBOSE STEEL

- DIESEL GENERATOR SUPPLIERS
  - FAIRBANKS MORSE
  - COOPER ENERGY SERVICES
  - TDI
  - STEWART & STEVENSON
  - MORRISON-KNUDSON
  - ALCO

- ALLEGATION FOLLOWUP
  - QA PROGRAMS
  - MATERIAL PROBLEMS

- EQUIPMENT QUALIFICATION SITE INSPECTIONS
  - ZION 2
  - CALVERT CLIFFS
  - CRYSTAL RIVER
  - FT. CALHOUN

- LICENSEE/VENDOR INTERFACES
  - HATCH
  - SUMMER
  - DAVIS BESSE

- CONTAINMENT TENDON PROBLEM - J.M. Farley

- VENDOR/LICENSEE INFORMATION INSPECTIONS
  - GE
  - TERRY TURBINE
  - ROSEMONT
  - W
  - FAIRBANKS MORSE
  - CE

RECENT INSPECTION AREAS (CONTINUED)

- INSPECTIONS CONDUCTED IN FY 85
  - AEs - 11
  - NSSSs - 6
  - FUEL FAB - 5
  - LICENSEES - 8
  - MATERIAL SUPPLIER - 9
  - ALLEGATION FOLLOWUP - 7
  - EQ TEST LABS - 9
  - OTHER - 13

## FUTURE EFFORTS

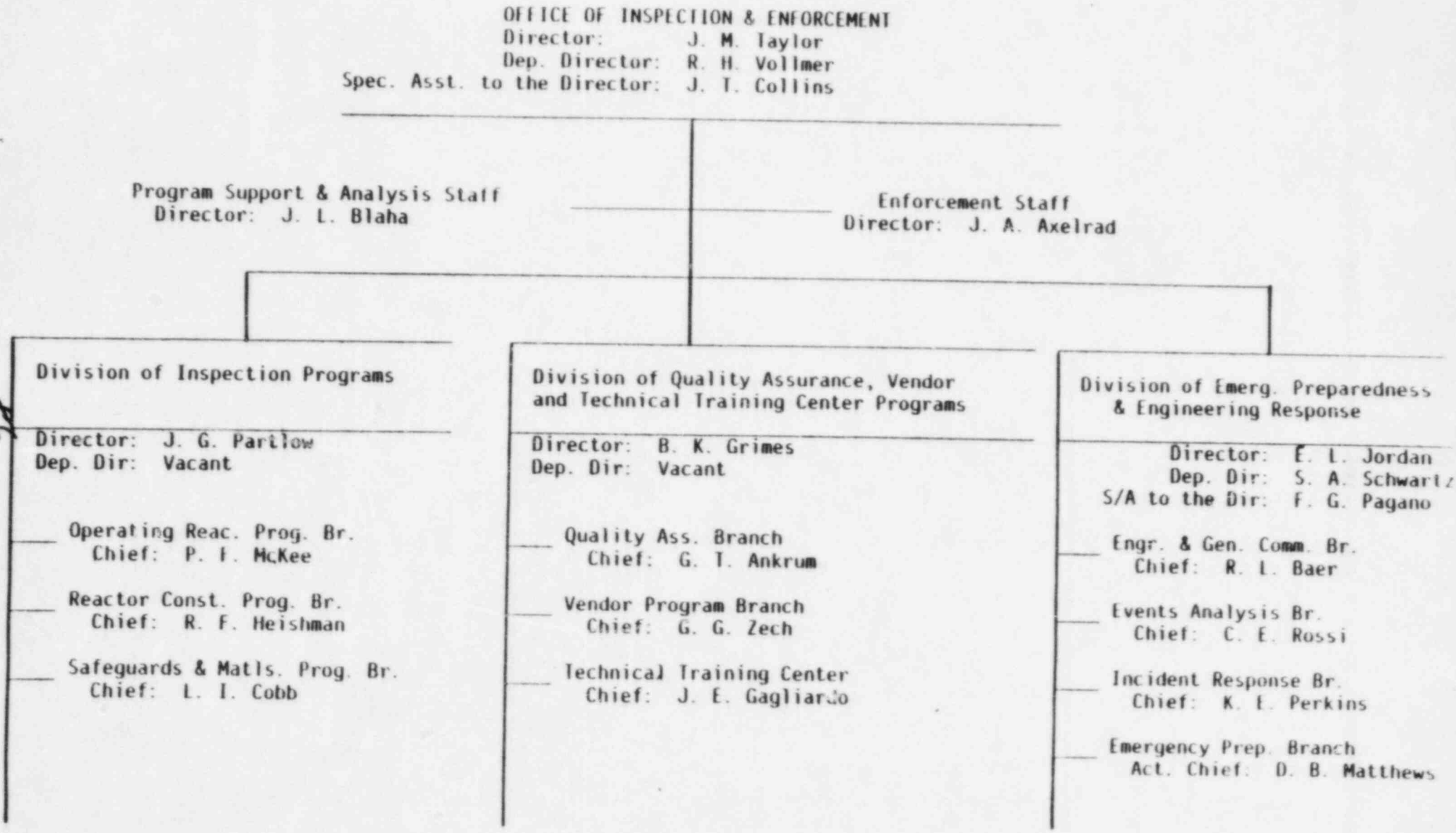
- Review and Assess Changes in Vendor Industry
  - NSSSs and AEs Role
  - Reduction/Changes in Vendor Suppliers
- Continue Emphasis on Hardware Quality and Operational Safety Issues
- Continue to Reinforce Licensees' Responsibilities for Vendor Products and Services
- Monitor Vendor/Licensee Interface
  - Site Inspections
- Significant Issues
  - Outage Management
  - Replacement Parts
  - Foreign Suppliers
  - Part 21 Reporting
  - Licensee Involvement
- Generic Communications
  - IN's
  - Bulletins
  - Letters
  - Enforcement Actions

VENDOR PROGRAM BRANCH

CHIEF

GARY G. ZECH

| | |
|---|---|
| PROGRAM COORDINATION SECTION | REACTIVE INSPECTION SECTION |
| JAMES C. STONE | ELLIS W. MERSCHOFF |
| EQUIPMENT QUALIFICATION INSPECTION SECTION | SPECIAL PROJECTS INSPECTION SECTION |
| ULDIS POTAPOVS | JOHN W. CRAIG |


OFFICE OF INSPECTION & ENFORCEMENT
Director: J. M. Taylor
Dep. Director: R. H. Vollmer
Spec. Asst. to the Director: J. T. Collins
Program Support & Analysis Staff
Director: J. L. Blaha
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Director: J. A. Axelrad
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Chief: J. E. Gagliardo
Division of Emerg. Preparedness & Engineering Response
Director: E. L. Jordan
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Incident Response Br.
Chief: K. E. Perkins
Emergency Prep. Branch
Act. Chief: D. B. Matthews

DELETION 1

# MEETING HANDOUT

| Meeting No. | Agenda Item | Handout No. |
|---|---|---|
| 300th | 2 | 1 |

Title

LONG-RANGE PLAN FOR NRC

Authors

M. W. Carbon

List of Documents Attached

| Instructions to Preparer | From Staff Person |
|---|---|
| 1. Punch holes<br>2. Paginate attachments<br>3. Place copy in file box | R. K. Major |

# LONG-RANGE PLAN FOR NRC

## A. ESTABLISHMENT OF ACRS LRP SUBCOMMTITEE

- Concluded at Harpers Ferry Retreat, November 1984, that ACRS should offer recommendations to the Commissioners on long-range planning for NRC.

- Long-Range Planning Subcommittee set up at February 1985 meeting. Carbon (Chairman), Lewis, Moeller, Remick, Siess, and Wylie.

- Stated task: "To assess the need for a plan to deal with the technical issues related to nuclear power plant safety and safety regulation over the next five to ten years."

- Subcommittee meetings held: March 1 and April 5.

## B. NEED FOR AN LRP

- As Dave Ward wrote in June 1984: The NRC has no long-range plan. There is the yearly PPG memorandum and there is a long-range research plan. But there is no explicit overall long-range, documented plan or strategy for the agency. For example, is it the intent of the agency to move toward greater self-regulation by the industry? Is there an intent to move toward performance requirements rather than prescription in regulation? Is the intent of the agency to phase itself out of a leadership role in reactor safety research? --- Most institutions, corporations for example, have long-range plans. They then develop research plans which cover research to fill the needs of the corporate plans.

- The Subcommittee believes that conditions continually change and that an LRP will help the NRC focus on what needs to be done as well as how best to achieve it.

- It is also recognized that NRC actions have a large influence on both the nuclear industry and the public interest, and it is felt that there is a strong need for the NRC to annunciate the initiatives it intends to pursue and the directions it intends to follow during the next five to ten years.

At the time we were formulating our plans, Chairman Palladino was also requesting OPE to develop a Five-Year Plan, and he later requested that the ACRS and OPE keep each other informed of its activities. OPE put together a "Preliminary Draft Outline" on February 28 which incorporated the following:

a. Safety-Related Activities

1. Implement the safety goal
2. Resolve safety issues
3. Source term
4. Severe accident policy
5. Relicensing of nuclear facilities whose licenses will be expiring
6. Vendor inspection activities
7. Revise regulations

b. Regulatory Improvements

1. Standardized plant designs
2. Preapproval of plant sites
3. Reactivating construction of mothballed facilities
4. Advanced reactor designs
5. Industry safety initiatives

c. Waste Management Activities

1. High-level waste
2. Low-level waste
3. Nuclear materials and facilities

d. Other activities

1. Organizational changes

The Chairman's office has recently informed Dave Ward and Ray Fraley that it hopes ACRS will emphasize Technical Issues in its effort and OPE will emphasize Policy Issues in order that Agency resources be utilized most efficiently.

It is understood that OPE hopes to have an LRP to present to the Commissioners in mid-1985.

C. WHAT SHOULD BE THE PRIMARY GOALS OF THE NRC?

Public policy is given in the Atomic Energy Act of 1954 as follows:

. "It is -- the policy of the U.S. that -- the development, use, and control of atomic energy shall be directed so as to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise."

. "It is the purpose of this Act -- (to provide) for, 'd. a program to encourage widespread participation on the development and utilization of atomic energy for peaceful purposes to the maximum extent consistent with the -- health and safety of the public;'"

The Energy Reorganization Act of 1974 established further public policy by stating: "There are hereby transferred to the Commission all the licensing and related regulatory functions of the Atomic Energy Commission ...."

The Subcommittee believes the primary goals of the LRP should be to assist the agency:

- First and foremost, to limit to an acceptable level the probability of any nuclear power plant (NPP) accidents which would have a major impact on the public health and safety (PHS),
- To assure that routine operation of NPPs does not result in an undue impact on the PHS,
- To determine the levels of safety which are appropriate to the public interest, and
- To enunciate clearly the objectives of its nuclear safety efforts and to assess the degree to which its objectives are being met.

D. SCOPE OF LRP

- It is believed that any suggestions for a proposed LRP should be addressed primarily to the Commissioners.
- It is believed that the LRP should emphasize the need for changes not currently being made. For example, it would say little or nothing about ATWS.
- It is believed that our LRP proposals should not be limited to technical-safety issues (e.g., ECCS matters) but should also incorporate so-called administrative-safety matters (e.g., decentralization of the Staff). Further, it is believed that consideration of political-safety matters (e.g., a single administrator) should not be ruled out although they would receive less emphasis in this study.
- It is planned that these LRP suggestions will address power reactors primarily with little or no attention to non-power reactors and reprocessing.

E. SUBCOMMITTEE APPROACH

The Subcommittee's plan for developing an LRP has been and is:

1. To develop a list of specific issues on which NRC attention may be needed, to discuss them and eliminate the lesser-important, and to categorize the remaining. The result defines, tentatively, the content of the LRP,
2. To seek full Committee input and guidance,

3. To invite subsequently several selected people to meet with us and comment on the categorized issues -- to offer advice such as: "Are each of the issues important?" "Are there other, more-important ones not on our list?" "Do you have suggestions for how to tackle the issues?" etc.,

4. Then to prepare a final, suggested LRP for consideration by the Committee and recommendation to the Commission. It is our goal to bring a first-year plan to the Committee in the September/October time frame (as requested by our Chairman), but first priority will go to doing a good job.

After two meetings, the Subcommittee has considered 50 or 60 issues and categorized a smaller number into Technical Issues and Regulatory Process as follows:

## TECHNICAL ISSUES

1. Simplification

The goal in addressing this issue would be for the NRC to reassess, modify, and/or change regulatory requirements, where appropriate, with the objective of simplifying designs, operation, and maintenance of NPPs consistent with appropriate levels of safety. This activity would be to improve the safety of existing as well as future plants.

The likely thrust would be for the Staff to initiate basic system studies to review which safety requirements are really important for different reactors.

2. Safety Philosophy

It is believed the time may be appropriate to review the Safety Philosophy used to help ensure NPP safety. In particular, two areas may warrant attention:

a. Defense-in-depth

- How much do we have?
- What contributes most and what least?
- What is the significance and role of containment? Of DHR systems?
- What changes should be made with regard to future requirements?
- Should emphasis between prevention and mitigation be modified from past practice?

- Should the agency establish a policy concerning remoteness in the siting of NPPs?

b. Transition from Dterministic to Probabilistic Regulation Including Uncertainty

- How far have we gone?
- How far should we go?
- How far can we go?
- How can we do it?
- What should the timetable be?

3. Quality Asurance

It is believed that a serious study is needed to determine what steps should be taken and what directions should be followed with respect to QA programs.

4. Unquantified Conservatism

As mentioned earlier, the objective of the Commission should be to attain and to maintain a level of safety appropriate to the public interest, and the LRP should describe the means to be used. This requires realistic assessment of the actual level of safety, with the accompanying problems of uncertainty. It is current policy, as we understand it, to deal with uncertainty through conservatism, to provide assurance that the objectives are being met. The conservatisms are, however, rarely quantified and often unrecognized, and it is not clear that the concatenation of ill-controlled unquantified conservatism leads in the end to a safe product. This problem, which is central to regulatory standards, cries for attention.

5. Appropriate Level of Safety

The need continues for clarification of what constitutes undue risk to the health and safety of the public (i.e., "how safe is safe enough"). The Commission has published its policy statement on safety goals and has completed a two-year evaluation program. The Commission will need to address the results of the evaluation program, decide what are to be its safety goals, and enunciate the extent to which it will utilize its safety goals in the regulation of nuclear safety.

6. Automation of NPP Operation

How much automation of the operation of NPPs is needed and appropriate?

7. Safety Research

What should the NRC's role be in leadership of safety research? (Note: CSNI/OECD organizations are endeavoring to define the relative responsibility of governments and industry in reactor safety research.)

Should NRC do both confirmatory research as well as research to improve safety? Should it do research to permit relaxation of known, conservative limits when the limits were imposed by NRC itself?

8. Standardization

In the apparent rush for standardization, what do we really mean? What are the bounds and limits? Has anyone thought through the process?

## REGULATORY PROCESS

1. Backfitting

It is believed that the broad subject of backfitting (defined here to include design, construction, procedures, operations, staffing, and other changes) warrants review.

- It is surely undesirable that construction deficiencies are sometimes found only about the time a plant is scheduled to go into operation. Should NRC regulations be modified to incorporate specific certification points as part of design and construction?

- It is believed that the threat (the possibility) of backfitting on operating plants may hold up safety improvements on new plants. Are studies needed to determine the extent to which this is so and to determine the need for and method of remedy?

- Regulatory personnel can always find that things done in the past (analyses made, codes developed, hardware changes mandated, etc.) can be improved -- it didn't dig deep enough the first time around, new analysis techniques have evolved, etc. Should there be certification points for the entire regulatory process, not just for design and construction?

2. Performance vs. Precriptive Approach to Regulation

- (Is there)(Should there be) an intent to move toward performance requirements rather than prescription in regulation?

- Should the NRC encourage smaller (and thus less expensive) NPPs which could be performance tested for safety (in the manner that new airplanes are flight tested)? Would such testing of plants increase safety, add stability to and simplify the regulatory process, etc.? Does such an approach merit study?

- Is the process for getting new or improved safety ideas and concepts unduly cumbersome? Is initiative stifled, are efforts to keep operating plants up with the state-of-the-art (in instrumentation, for example) discouraged, is there a net loss in safety?

3. Adversarial Relationship

Is the current adversarial relationship between the NRC and the industry counterproductive to safety? (It is recognized that some changes have taken place over the last year or two.) How far should and can the NRC go to modify its approach? What is the role of fines in this matter?

Does the Hearing Process contribute unduly to this negative relationship?

4. NRC Personnel and Organization

The importance of technical disciplines to the NRC mission will change with time (e.g., emphasis will shift from licensing to the monitoring of operations, waste management activities are growing, etc.) Questions such as the following arise.

- Does the agency have the flexibility to bring in new kinds of people as they are needed? Is an inhouse or external educational program needed to retrain agency employees?

- How should the organizational relationship between NRR and IE change as emphasis changes from licensing to operation?

- How can the NRC shorten the communication lines between the operator and the decision maker within the agency? Should this final decision maker be in IE or NRR? How much decentralization is appropriate?

5. Operator Personnel and Organization

- Much of the real technical expertise in the NPP field is in industry (rather than in government agencies). Could the NRC make more use of this industrial expertise by fostering something in the design and construction area comparable to what INPO is expected to do in operations?

- Can the NRC develop meaningful "indicators of performance" which would let it evaluate the quality of personnel at each plant? Would this allow different levels of regulation to different plants?

- Should the training of NPP operators be taken over by the government as Senator Moynihan suggests? Is an "elite" needed to operate NPPs?

6. Licensee Responsibility

Should the NRC license the utility for <u>everything</u> (knowledge of plant design, etc.) or should it license like FAA does -- license the vendor for the plant and the utility for its maintenance and operation?

7. International Safety

Should the NRC move in the direction of greater international cooperation in the safety area -- research, design crtieria, etc.?

8. Early Site Approval and Combined CP-OL License

Should be mentioned in the final report.

IMPLEMENTATION

People or organizations from whom input may be sought are aproximately as follows:

- Past Commissioners Ahearne, Bradford, Gilinsky, Hendrie
- Office directors of IE, NRR, OGC
- Selected present and former staff members Bernero, DeYoung, Hanauer, Knight, Pete Morris, Mattson, Stello
- Mr. Tourtellotte. Members from the outside Regulatory Reform group
- Representatives from one A/E, EPRI, two vendors, NUMARK, Cordell Reed, Bill Lee, Counsil from NE utilities
- Someone from OMB, DOE, GAO, OTA
- Discussions with GPR and RSK at May 1985 meetings
- Two hearing board members (Tony Cotter, Fred Schon)
- Three or four selected Congressional aides
- A few selected people such as Spence Bush (who heads a piping code task force), C. O. Miller (who was a leader in NTSB safety programs), perhaps Tony Roisman, maybe Judge Shelley Wright

APPENDIX VIII
SEISMIC DESIGN MARGINS IN NUCLEAR FAC.
& SEISMIC REEVALUATION PLAN FOR
DIABLO CANYON NUCLEAR STATION

# MEETING HANDOUT

| Meeting No. | Agenda Item | Handout No. |
|---|---|---|
| 300 | 14.1-3 | 1 |

**Title**

Seismic Design Margins In Nuclear Facilities and Seismic Reevaluation Plan for Diablo Canyon Nuclear Station

**Authors**

**List of Documents Attached**

1. Status Report
2. Draft Minutes of Combined ACRS Extreme External Phenomena and Diablo Canyon Subcommittee Meeting held in Culver City, CA on March 21, 1985

| Instructions to Preparer | From Staff Person |
|---|---|
| 1. Punch holes<br>2. Paginate attachments<br>3. Place copy in file box | E. IGNE |

300TH ACRS MEETING
APRIL 12, 1985
4:45 - 5:15 P.M.

STATUS REPORT: REPORT OF THE COMBINED ACRS SUBCOMMITTEES ON DIABLO CANYON AND EXTREME EXTERNAL PHENOMENA

Diablo Canyon, C. Siess, Chairman

On March 21, 1985, the joint subcommittee heard PG&E's status report on its Long Term Seismic Program. This Program was developed in part on the ACRS letter of July 14, 1978, which recommended that "...the seismic design of the Diablo Canyon be reevaluated in about 10 years taking into account applicable new information." In addition, differing interpretations of the geologic setting of the region near the plant have been put forth during the past several years. As a result, the following License Condition was added to the operating license for Diablo Canyon:

1. PG&E shall identify, examine, and evaluate all relevant geologic and seismic data, information and interpretations that have become available since the 1979 ASLB hearing in order to update the geology, seismology, and tectonics in the region of the Diablo Canyon Nuclear Power Plant. If needed to define the earthquake potential of the region as it affects the Diablo Canyon Plant, PG&E will also reevaluate the earlier information and acquire additional new data.

2. PG&E shall reevaluate the magnitude of the earthquake used to determine the seismic basis of the Diablo Canyon Nuclear Plant using the information from Element 1.

3. PG&E shall reevaluate the ground motion at the site based on the results obtained from Element 2 with full consideration of site and other relevant effects.

4. PG&E shall assess the significance of conclusions drawn from the seismic reevaluation studies in Elements 1, 2 and 3, utilizing a probabilistic risk analysis and deterministic studies, as necessary, to assure adequacy of seismic margins.

   PG&E shall submit for NRC Staff review and approval a proposed program plan and proposed schedule for implementation by January 30, 1985. The program shall be completed and a final report submitted to the NRC three years following the approval of the program by the NRC Staff.

   PG&E shall keep the Staff informed on the progress of the reevaluation program as necessary, but as a minimum will submit quarterly progress reports and arrange for semi-annual meetings with the staff. PG&E will also keep the ACRS informed on the progress of the reevaluation program as necessary, but not less frequently than once a year.

C. Siess will present to the ACRS a briefing of about 15 minutes on this program.

Extreme External Phenomena, D. Okrent, Chairman

On March 21, 1985, the joint subcommittee heard a status report of the NRC Seismic Design Margins Research Program.

In order to provide technical guidance to the U.S. Nuclear Regulatory Commission on the subject of seismic design margins at nuclear power plants, the NRC in mid-1984 formed an "Expert Panel on Quantification of Seismic Design Margins" (Budnitz, Amico, Cornell, Hall, Kennedy, Reed and Shinozuka). The members of the Panel are supported by contracts with Lawrence Livermore National Laboratory, which has also furnished key technical personnel for the Panel's work. The Panel is charged with working closely together with an in-house NRC staff "Working Group on Seismic Design Margins," (Knight and Richardson, co-chairmen) to address key regulatory needs in the area of seismic margin. The Panel's modus operandi is primarily to carry out advanced technical work as a working Panel, but it also provides advisory services to the NRC as needed in the area of its expertise.

The Panel's first report was published in the fall of 1984, entitled "NRC Seismic Design Margins Program Plan." This report outlines a proposed NRC program in the seismic design margins area, and sets forth how the Panel's work is to be accomplished, including a schedule, tasks, and their relationship. The Program Plan also sets out a number of milestones over the 1984-1985 time period, of which this Interim Report is the first milestone.

The objective of this Interim Report is to discuss progress accomplished to date in studying the issue of quantification of seismic design margins in nuclear power plants. The report contains background material that introduces the reasons why the margins issue is important; material describing how the Panel has identified the near-term objectives of its work; descriptions of what the Panel has accomplished to date; and discussions of future work to be undertaken.

In particular, this Interim Report covers progress accomplished toward the establishment of screening guidelines that would be useful in studying how much seismic margin exists at a given nuclear power plant. The body of this report covers how the Panel is approaching this task.

D. Okrent will present to the ACRS a briefing of about 15 minutes on this program.

Background Material

Attached: Summary-Minutes of the March 21, 1985 meeting

ACRS Staff Contact:

E. G. Igne x 41413
R. P. Savio x 43278

ISSUED: April 8, 1985

SUMMARY-MINUTES
OF THE COMBINED MEETING OF ACRS SUBCOMMITTEES ON
EXTREME EXTERNAL PHENOMENA AND DIABLO CANYON
MARCH 21, 1985
CULVER CITY, CA

The combined Subcommittees on Extreme External Phenomena and Diablo Canyon met at the Pacifica Hotel in Culver City, California on March 21, 1985 to review the status of the NRC Staff's program on seismic design margins and Pacific Gas and Electric's (PG&E) program plan for the long term seismic reevaluation of the seismicity at the Diablo Canyon site.

Notice of the meeting was published in the Federal Register on March 4, 1985 (Attachment A). The schedule of items covered in the meeting is in Attachment B. A list of handouts, kept with the office copy of minutes, is included in Attachment C. The meeting was entirely open to the public. There were no written or oral statements received or presented from members of the public at the meeting. E. Igne was the cognizant staff member for the meeting.

Principal Attendees

ACRS

C. Siess, Chairman, Diablo Canyon
D. Okrent, Chairman, Extreme External Phenomena
P. Shewmon, Member
H. Etherington, Member
D. Ward, Member
R. Axtmann, Member
M. Carbon, Member
P. Pomeroy, Consultant
R. Scavuzzo, Consultant
B. Page, Consultant
G. Thompson, Consultant
M. Trifunac, Consultant
E. Luco, Consultant
J. Maxwell, Consultant

NRC

J. Knight
J. Richardson
S. Brocoum
L. Reiter

NRC Consultants

R. Kennedy
R. Budnitz
P. Amico
J. Reed
C. Cornell
M. Shinozuka
W. Hall

PG&E

D. Brand
W. White
L. Cluff
J. Garrick
D. Hamilton
L. White
J. Frazier
D. Bligh
W. Tseng
R. McGuire

C. Siess, Chairman of this combined meeting, convened the meeting at 8:30 a.m.

J. Knight, NRR, presented a brief introduction on the history and status of the seismic margins program with respect to plant licensing. He stated that this program was initaited by the ACRS in 1977 when questions of improper use of deconvolution of the ground motion methodologies arose on the North Anna Plant. In addition, the possibility of earthquakes being larger than the SEE value prompted this study. J. Knight noted that regulations did not require the plant to be designed beyond the SSE, but that, in the common interest of both the industry and regulatory body, seismic risk assessment, as part of the PRA program, was initiated in some plants. At the present time about 16 plants have been assessed for seismic margins.

D. Okrent asked whether, if PRA studies show a potentially adverse result, the utility is obligated to notify the NRC. J. Knight replied

that lawyers may need to provide the answers, but he ventured to say that if the plant is designed to the SSE value and met all applicable codes the utility has no further obligations and does not have to report potentially adverse effects.

In reply to a question, R. Kennedy stated that faults such as cracks in components as piping and pressure vessels are accounted for in the PRA studies, but that gross undiscovered design and construction errors are not considered.

J. Knight mentioned three other activities that have a bearing on the seismic margins program. They are 1) the Seismic Qualification Utility Group that has been gathering data on performance of electrical equipment, 2) the eastern U.S. Seismicity Program at LLNL that provides a basis for a new look of eastern plants and 3) the NRC Piping Review Committee's comprehensive study including the work on seismic design in piping systems.

J. Richardson, RES, presented a brief overview of the seismic margins research program. He discussed the elements accounted for in the seismic design margins study. The program elements include seismic input obtained from the Eastern U.S. Seismicity Program, methods development and validation program which LLNL is performing and the fragility and response program where component fragilities, piping capacities and reliability data base information will be obtained. With this information seismic design margins studies will be performed and quantified. He stated that EPRI's program in this area will be closely coordinated with the NRC's program. The budget for NRC's program is about $5-8 million per year. EPRI's budget for their program will be about $4-5 million per year.

J. Richardson stated that cooperation with foreign countries, especially with the FRG and Japan, to obtain validation data is being vigorously

pursued because funds to develop our own test facilities do not exist. It was suggested by a member of the subcommittee that New Zealand should be contacted to see if they could provide some useful information to our program.

In reply to a question, J. Richardson stated that "yes" there was a large difference in the results of the analysis and experiment performed at HDR. A more realistic analysis that accounted for system non-linearities, i.e., geometric gaps between pipe and hangers, resulted in a more favorable comparison.

A question on withdrawing Reg. Guides 1.46 and 1.48 and implications thereof was brought up but ruled out of order by the Chairman. This matter will be reviewed at a later subcommittee meeting.

A question was asked as to why the Japanese piping design is "stiff" and why we are going from "stiff" to "flexible" piping systems design and that an integrated study should be performed in order to provide insights to the overall plant behavior under SSE and earthquakes more severe than the SSE. This study should provide a technical basis for using either "stiff" or "flexible" piping systems. The Staff will respond.

As a result of the ACRS letter to the EDO, dated April 4, 1984, the formation of the NRC Seismic Design Margins Group was initiated in order to quantify seismic design margins. Reporting to this Group is a panel called the Seismic Design Margins Expert Consultants. This panel has written an interim report that discusses progress accomplished to date in studying the issue of quantification of seismic design margins in nuclear plants. In particular, this report covers progress accomplished toward the establishment of screening guidelines that would be useful in studying how much seismic margins exist at a given nuclear power plant.

R. Budnitz, Chairman of the Expert Panel on Quantification of Seismic Design Margins, discussed the objectives of the panel charter. The dominant issue is a need to understand how much seismic design margins exist in a plant. He stated that seismic margins are defined as how much larger an earthquake must be (above to SSE) in order to compromise the safety of components, structures and equipment of a nuclear power plant. The seismic margins study applies specifically to eastern plants, whose design basis earthquake is in the range of 0.1 to 0.25g.

At this point in their study, Phase I, the goal is to develop screening guidelines that can be used at a plant not studied by a full-scope PRA. With these screening guidelines the expert panel believes that any items in a plant can be systematically studied to determine seismic margins defined in terms of earthquake size. These guidelines should provide a basis on which to focus resources for either doing more study, or in determining what items can be neglected. During Phase II, research programs are planned in order to fill in areas where technical basis are lacking, for example, operator behavior modeling, design and construction errors, and nonlinear structural behavior. Gaps of information exist in other areas such as BWR plants, and ice condenser containments. R. Budnitz stated that the interim screening guidelines will be applied to screen a couple of plants for a trial run.

The need to discuss with the NRC Staff potential research needs for the seismic margins program will be taken up at another subcommittee meeting.

R. Kennedy, SMA, presented a status of the expert panel's preliminary assessments of the seismic margin of a number of items of equipment, structures, and components of representative nuclear power plants as judged by the panel from available capacity data base. The sources of information were the results of seismic PRAs performed to date. He stated that there are seven published PRAs as well as six unpublished

PRAs. Data on how components, structures and equipment similar to that in nuclear power plants performed in historic earthquakes of up to 0.5g were also available. In addition, the Seismic Qualification Utility Group's (SQUG) and EPRI data was utilized. The panel focused on plants located in the eastern U.S. designed for 0.1 to 0.25g. As a measure of margin, the panel used the concept of high confidence, low probability failure (HCLPF) capacity. In PRA context, HCLPF was judged to represent about 95 percent confidence of not exceeding about 5 percent conditional probability failure. However, in the panel's judgment HCLPF tends to represent lower estimate on capacity for which it is extremely unlikely that failure will occur. The panel's general points are as follows:

- Median capacity is at least a factor of 2 greater
- Design capacity has built-in conservatisms
- Many components have inherent ruggedness due to nonseismic loads
- Capacity definition is generally below catastrophic collapse.

The panel in its preliminary report has presented HCLPF capacities for many nuclear power plant components, e.g., containments, NSSS supports, piping, valves, batteries and racks, active electrical equipment, dams and dikes, etc.

P. Amico, NRR consultant, discussed the systems aspect of the seismic design margins program. He stated that, basically, the screening criteria (use of HCLPF) that the expert panel have developed is based on the seismic PRA results of six out of the seven PRAs that were made publicly available; 6 PWRs and 1 BWR. The BWR PRA was considered but not utilized in the development of the screening criteria, and therefore the screening criteria are generally applicable only to PWRs. Sixteen dominant sequences of six PWR PRAs were reviewed. Of these sixteen, all would have been found under the initial screening concept. Of those, sixteen, 15 would have been properly assigned to plant damage states, leaving one not properly assigned a damage state. He stated that this

error would have overestimated the frequency of one serious PDS, but that core melt risk would be unaffected. Some possible effects, such as relay chatter, are not adequately treated in the PRAs upon which the conclusions were based.

It was stated that the screening criteria will be used on two trial plants. In summary, he stated that, based on the expert panel screening guidelines concept which will be refined with additional research, a methodology for evaluating the seismic margins, and presumably a methodology for evaluating seismic risk, can simply be performed without an extensive PRA.

In summarizing this portion of the agenda, the Chairman stated that the next step is to get the final report from the expert panel on the quantification of seismic margin before we meet again -- maybe within the next year. In addition, the Chairman added that, personally, he likes the idea of the high confidence, low probability concept.

J. Knight, NRR, introduced the subject of the Diablo Canyon Long Term Seismic Program Plan. Before he proceeded with this matter, he stated that Unit 2 plans to load fuel in late April, go critical in late June and be in low-power operation in early July. Unit 1 is at full power, preparing to do a warranty run. He then introduced S. Brocoum, NRR Geology Section, and L. Reiter, NRR Seismology Section.

S. Brocoum presented a brief history of Diablo Canyon license seismic conditions initiated by the ACRS letter of July 14, 1978 suggesting that seismic reevaluation be performed in 10 years. The license condition approved by the Commissioners and endorsed by the ACRS sets forth specific program elements, as follows, as license conditions:

1. Geology and tectonics
2. Earthquake magnitude
3. Ground motion/soil structure interaction
4. Probability risk assessment/deterministic evaluation

He discussed the review schedule for the NRC Staff approval of the recently submitted Diablo Canyon program plan for the seismic condition. The Staff plans to formally approve PG&E's program plan by July 31, 1985, after the plan is submitted for ACRS consideration on July 1, 1985. He said, in response to a question, that PG&E's seismic reevaluation plan is very comprehensive and ambitious and that the time to complete it -- within three years -- was a Commission decision.

In response to a question, J. Knight stated that he will look into the resolution of Diablo Canyon use of high-strength bolts for safety-related components.

D. Brand, VP Engineering for PG&E, led off PG&E's presentation. He stated that in conformance with the license condition, they have developed a very comprehensive program which encompasses an integrated approach in in-depth studies in the areas of offshore and onshore geology, seismology, ground motion, soil structures interactions, seismic hazard, fragility analysis and probabilistic risk assessment. The program was submitted to the NRC Staff in January and presently is undergoing review. Four meetings with the Staff were made in the course of developing the program. He stated that L. Cluff, program manager for the long-term seismic program, would present an overview of the program related to geology tectonics and W. White, Bechtel Co., would handle the engineering aspects of the program.

L. Cluff, stated that the major goals of the Geology/Seismology Reevaluation Program are as follows:

° To update the map of the central and southern Santa Maria Basin and adjacent on-land area, with data relating to the subsurface dimention

° To update the map of the San Gregorio-Hosgri fault system, also with data relating to the subsurface dimension

- To improve understanding of the pattern and rate of tectonism in the region of Diablo Canyon
- To reevaluate the seismic capability of the Hosgri fault and any other faults found to be significant to the design earthquake for Diablo Canyon.

W. White next discussed the engineering portion of the program from the numerical modeling of ground motion through PRA. Ground motion will be performed by numerical modeling with the following elements:

- Estimate site-specific ground motion characteristics for conditions relevant to Diablo Canyon
- Evaluate the range of ground motion effects that are plausible and the associated probabilities
- Decompose the predicted ground motion into various components of incoming waves for soil-structures interaction analysis

Seismic hazard analysis will be an integration of geological and soil-structures interaction information. Some key features of the seismic hazard analysis are as follows:

- Known tectonic interpretations will be incorporated with special consideration given to those associated with central coastal California
- Provisions will be made to accommodate the information being generated on a continuing basis in other areas of the LTSP
- Analysis and assessments, some involving expert opinion, will be documented.

This analysis will provide ground motion (spectral ordinates and duration) at the base mat of the plant, that will account for the distribution of the maximum magnitude earthquake during the life of the plant.

Information from the seismic hazard analysis will be used to generate fragility curve acceleration capaciy on which a median acceleration capacity on the high confidence, low probability number will be obtained.

PRA will involve the following items:

- Assess the significance of conclusions drawn from seismic reevaluation studies
- Assess the significance of conclusions drawn from seismic reevaluation studies
- Accomplished by developing and interpreting probability curves for frequency occurrence of different plant damage states
- Methodology will allow backtracking to identify the major contributors

In response to a question, J. Garrick stated that the PRA analysis consists of three separate models. They are 1) Level I PRA, a quantification of core damage, 2) Level II PRA, a quantification of the release or source term and 3) Level IV PRA, a quantification of the sequences.

L. Cluff then stated that any questions regarding further details on the elements of the Diablo Canyon seismic reevaluation program will be handled by further questions by the subcommittee and response.

As a comment, B. Page, ACRS consultant, stated that his reaction to the geological aspect of the program is favorable and that he was impressed by its comprehensiveness and thoroughness. He further stated that the personnel involved are very competent. Other ACRS consultants voiced similar opinions. In response to a question regarding the characterization of the Hosgri fault, D. Hamilton stated that, based on current study, the focal mechanisms toward the south end of the Hosgri and in the area of the transverse ranges are dominantly a reverse thrust mechanism, although some have a component of a strike slip. The study

being proposed will assemble all the geological evidence so that choices will be narrowed, and effectively choose among the possibilities a focal mechanism of either a strike-slip or thrust fault. Information gathered by private oil companies for the exploration of oil in the region will be extensively studied. The earthquake focal mechanisms must be established in order that the magnitude of the SSE be accurately determined. (Presently Diablo Canyon is designed for a 7-7.5 magnitude earthquake.)

It was stated that human-actions analysis in the PRA studies will be accounted for if seismic effect is a critical issue with respect to risk. Water hammer effects will be included in the PRA studies. Regarding relay chatter fragility estimates, this matter is likely to be a more dominant contributor to risk at Diablo Canyon because the earthquake levels are higher than at most plants. This will be taken into account in the PRA studies.

The meeting was adjourned about 10:15 p.m.

Future ACRS Actions:

The NRC Staff plans to submit for ACRS comments, PG&E's Long-Range Seismic Reevaluation Program by July 1, 1985.

* * *

NOTE: A complete transcript of the meeting is on file at the NRC Public Document Room at 1717 H Street, N.W., Washington, DC or can be obtained at cost from Ace Federal Reporters, Inc., 444 North Capitol St., Washington, DC 20001, telephone (202) 347-3700

# Seismic PRA Results

| Plant | Damage State | HCLPF |
|---|---|---|
| Zion | SE | .3g |
| IP2 | SE | .34g |
| | AE | .5g |
| | Z | High |
| IP3 | SE | .37g |
| | TEF | ~.4g |
| | AE | .5g |
| | Z | High |
| Millstone 3 | TF | .26g |
| | SE | .4g |
| | AF | .45g |
| | V3 | .6g |
| Seabrook | 7FP | .3g |
| | 3FP | .5g |
| Oconee | IC | .17g |
| | II C | .17g |
| | III C | .15g |
| | V C | .28g |

- In general, the dominant seismic core melt plant damage states involve early melt with loss of consequence mitigating functions.

# Standard Plant Functions Used in PRAs

## Grouped for Seismic Screening

GROUP A

1) Reactor Subcriticality

2) Normal Shutdown

3) Emergency Core Cooling (Early)

GROUP B

4) Emergency Core Cooling (Late)

5) Containment Heat Removal

6) Containment Overpressure Protection (Early)

7) Containment Overpressure Protection (Late)

Seismic PRA Results Indicate the Following:

- $P(B|EQ, A) = 1$

- $P(B|EQ, \bar{A}) \approx P(B|\bar{EQ}, \bar{A})$

That is, Functional Group B and Functional Group A are closely linked during seismic events.

# Suggested Screening Criteria

| Function | Peak Ground Acceleration | | |
|---|---|---|---|
| | <.3g | .3-.5g | >.5g |
| **Initiators:** | | | |
| Offsite Power | F | F - failure | F |
| RCS Integ (LOCA) | O - high confidence plant. | X - success | X |
| Contain. Integ | | | X |
| **Functional Group A:** | | | |
| Reactor Subcriticality | X | X | X |
| Normal Shutdown | F | F | F |
| Emergency CC (Early) | X | X | X |
| **Functional Group B:** | | | |
| Emer. Core. Cool. (Late) | A | A | A |
| Contain. Ht. Rem. | A | A | A |
| Contain. O.P. Prot. (Early) | A | A | A |
| Contain. O.P. Prot. (Late) | A | A | A |

Build occurs A occurs

## Analysis Steps:

1) "early" (group A) core melt ETs
2) simplified FTs (use fragility insights)
3) add susceptability to relay chatter and walkdown insights
4) evaluate resultant Booleans
   - core melt → HCLPF
   - risk estimate → median

F (
A
X

## Comments & Limitations

- Type II errors do not matter if only core melt margin is the goal.
- A plant walkdown is required to look for unique features.
- Our conclusions are based on a small sample of PRAs.
- At present, this is not applicable to BWRs.
- Some possible effects, such as relay chatter, are not adequately treated in the PRAs upon which our conclusions are based

# Detailed PRA Review

- 16 Dominant Sequences of Five PWR PRAs
- Of those sixteen, all of them would have been found under the initial screening concept (no Type I errors)
- Of those sixteen, 15 of them would have been properly assigned to plant damage states (one Type II error)
- The Type II error would overestimate the frequency of one serious PDS, but core melt would be unaffected.
- Oconee - just received - first glance confirms above results (except dam - special case)

## Possible Errors

- Type I - If there exist sequences of high likelyhood which result in core melt from success of Group A and failure of Group B, they will be missed.
- Type II - If there exist sequences of high likelyhood which resut in core melt from failure of Group A but for which the containment protection functions of Group B succeed, they will be erroneously assigned to plant damage states.

# INITIAL SCREENING CONCEPT

In evaluating seismic margin, it seems that a reasonable estimate can be obtained by concentrating virtually all the effort on the systems which provide the functions in Group A

## Exceptions ?

- Seabrook - 7FP
  - Late melt is due to unusual assumptions regarding RCP LOCA
  - Melt still caused by functional failures in Group A
- Oconee - IIC
  - Site specific effect due to dam failure
  - Timing results in flooding in late phase
  - Special cases must be evaluated

DELETION 4

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

April 15, 1985

The Honorable Morris K. Udall, Chairman
Committee on Interior and Insular Affairs
U. S. House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

In your letter dated February 11, 1985, to the Advisory Committee on Reactor Safeguards (ACRS) you asked that the ACRS submit for the record its views or those of individual members regarding the Nuclear Regulatory Commission's (NRC) budget request for Fiscal Years 1986-1987 or any programmatic or policy issues currently of concern. On February 15, 1985, we transmitted to the Congress our annual report on the NRC Safety Research Program (NUREG-1105). That report contains our detailed comments and recommendations for the NRC Safety Research Program and budget proposed for FY 1986. Our comments on the FY 1987 program will be provided later when details of the research program for this period are available to us.

We regret that we did not have the opportunity to testify at your Subcommittee's hearing on the NRC program. In lieu of that appearance, we would like to emphasize the following comments from NUREG-1105:

- We find the proposed funding of $121 million for the NRC Safety Research Program for FY 1986 to be barely acceptable, and we urge the Congress to make no further reduction.

- Funding for design of a Modular Test Facility (MTF), to replace the several existing facilities for thermal-hydraulic research, has been eliminated. If such a facility is found necessary or desirable in the future, we believe that it should be funded and operated by the Department of Energy (DOE) for use by the nuclear industry as well as by the NRC. If this should be the case, support by the Congress for such a DOE facility might be required.

- The NRC has proposed no research within the Office of Nuclear Regulatory Research on human factors in FY 1986. We disagree strongly with this decision and recommend that $2.5 million be provided for such research by reallocation of a portion of the funds now proposed for in-pile tests on damaged fuel in the Severe Accident Research Program.

- Funding for the research program on High-Level Waste (HLW) Management has been reduced to a level that will make it difficult for the NRC to meet the schedule for licensing a HLW repository. An appropriate remedy

would be for the Congress to devise a mechanism to allow the NRC to draw on the Nuclear Waste Fund to provide adequate funding for the HLW program.

Since these comments were already available to you in NUREG-1105, the main purpose of our testimony would have been to emphasize them. We note with regret that the subsequent Subcommittee markings were generally inconsistent with those recommendations.

In addition, we pointed out in NUREG-1105 that the funding for the NRC Safety Research Program has been declining continuously over the past few years. The NRC Staff believes that there is some level of research funding below which it will be very difficult to maintain a level of knowledge and expertise adequate to address and solve current problems, and more important, to address new problems in a timely manner when they arise, as they certainly will. The NRC Staff is preparing a Safety Research Program plan which addresses this issue. During the next few months, we expect to review and comment on the plan and on the need for, and the appropriate funding level of, a base research program.

We are in the process of developing positions in the following three important areas, and we would like the opportunity to discuss with your Subcommittee, at some future date, our positions on these matters:

. A base level of funding for future NRC safety research, mentioned above.

. An assessment of the present state of safety in the nuclear power industry.

. A long-range plan for NRC regulatory activities.

And finally, had we testified, we would have urged that you consider reinstating the budget and manpower cuts that the Commission plans to impose on ACRS activities during FY 1986 and 1987, particularly in view of the increased ACRS activities related to the civilian radwaste program.

Sincerely,

David A. Ward
Chairman

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## ADDITIONAL DOCUMENTS PROVIDED FOR ACRS' USE

1. Letter, R. B. Minogue, Director, Office of Nuclear Regulatory Research, to J. Curtiss, Associate Counsel, Subcommittee on Nuclear Regulation, Committee on Environment and Public Works, United States Senate, Impact Analysis on Further Cuts in NRC Research Program, April 4, 1985

2. Background Paper, Proposed ACRS Position Regarding the Need for an NTSB and ACRS Role in Accident Evaluation, April 11, 1985

3. Memorandum, J. E. Zerbe, Director, Office of Policy Evaluation, to the Commissioners, ACRS' Views on the Need for an Office of Nuclear Safety, April 10, 1985