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MINUTES OF THE ACRS SUBCOMMITTEE MEETING ON
REACTOR OPERATIONS
WASHINGTON, DC
MARCH 9 & 10, 1981

The ACRS Subcommittee on Reactor Operations held a meeting on March 9 & 10, 1981 in Room 1046, 1717 H St., NW, Washington, DC. The purpose of the meeting on March 9, 1981 was to hear a discussion of the NRC Staff's plans to formulate a Human Engineering Guide to Control Room Evaluation and on March 10, 1981 to begin the Subcommittee's review of Rep. Udall's inquiries on ATWS which were prompted by the June 28, 1980 Browns Ferry 3 partial failure to scram.

Notice of this meeting was published in the Federal Register on Friday, February 20, 1981. A copy of this notice is included as Attachment A. A list of attendees for this meeting is included as Attachment B, and the schedule for the meeting is included as Attachment C. A complete set of meeting handouts has been included in the ACRS Files. Attachment D is a list of the handouts and documents associated with the meeting. There were no written statements or requests for time to make oral statements received from members of the public. The meeting was entirely open to the public. The Designated Federal Employee for the meeting was Richard Major.

DISCUSSION WITH NRC STAFF

Mr. Kramer of the Division of Human Factors Safety (DHFS) gave an overview of the responsibilities of the DHFS. He noted that there are basically four elements to the program which are: control room design

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plant procedures, operator training, and management structure and the interaction between these four components. When asked by the Subcommittee if the optimum mix of these four components has been addressed, Mr. Kramer noted it had not but that the need to address this issue is recognized and will be addressed by Research.

Mr. Kramer noted the need for the DHFS was perceived after the accident at TMI-2. The Division has been in existence for about one year. Areas in the Action Plan that gave rise to the DHFS were cited and included: I(A), (B), (C), (D), (E), (F), and (G).

Mr. Kramer explained that NUREG/CR-1580 is basically hardware oriented. As this document evolves into NUREG-0700, more consideration will be given to an analysis of what information operators need to know.

Mr. Kramer noted, in response to questions, there is a fairly high degree of unanimity inhouse over the Staff position taken in the Supplement to NUREG/CR-1580 which is NUREG-0659 (Draft Report) Staff Supplement to the Draft Report on Human Engineering Guide to Control Room Evaluation. The Supplement contains a response to comments, sample check lists, draft systems review guidelines, and evaluation procedures. Over the past several months, more specialists in the area of human factors engineering have been added to the Staff.

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Mr. Voss Moore, Chief of the Human Factors Engineering Branch, explained that the purpose of the day's session is to obtain general comments from the Subcommittee and its consultants. He noted a letter from the Committee is not necessary. He explained that comments would be welcomed on the overall program and specifically on the Supplement to the Draft Guidelines of NUREG/CR-1580. Comments would be required in 6-8 weeks to be factored into the effective guidelines.

The guidelines presented during the meeting were for use by the utilities in reviewing their own control rooms. At a later time, Mr. Moore noted the Staff would explain the evaluation criteria to be used by the Staff in analyzing the utilities' control room reviews.

As a result of the various recommendations and findings resulting from the investigations of the Three Mile Island accident, the Task Action Plan (and specifically Plan I.D.1) was instituted to implement the various control room recommendations. The Staff contracted with Essex Corporation to develop the guidelines for a control room review. Essex was hired to provide human factors' expertise, and additional manpower the Staff was lacking. Essex had experience in the defense and aerospace fields and had worked on the Rogovin Report.

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The draft guidelines issued in the summer of 1980 were the sole product of Essex Corporation with no Staff input. The intent of the Staff in issuing the guidelines so quickly was to get public comments rapidly. NUREG/CR-1580 was issued for comment in July 1980. At this point, the Essex contract was terminated. The Staff has contracted with Lawrence Livermore, who is using Bio-Technology as its human factors subcontractor to assist the Staff in resolving public comments, and developing the effective guidelines.

The Staff Supplement to the Draft Report on the Human Engineering Guide to Control Room Evaluation not only contains a response to public comments, but identifies additional items not in the draft guidelines, such as, identifying information an operator may need to know for some process that is not in the control room. The Supplement will be out for public comment until the end of April. The effective guidelines will be issued by the end of May provided public comments are not too extensive.

Mr. Froelich described the control room guidelines' development. It began with informal guidelines and checklists in NUREG/CR-1270 developed by Essex Corporation. Draft guidelines in NUREG/CR-1580 were sent out for public review. Concurrently, the Staff was increasing the degree

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of control room reviews on their own during the NTOL reviews. NUREG-0659 was issued as a result of public comments on NUREG/CR-1580. Public meetings to discuss NUREG-0659 will be held on April 22nd and 24th. Additional public comments and Staff comments will be factored into NUREG-0700 which will contain control room evaluation criteria. NUREG-0700 will be ready for publication by the end of May.

Mr. Froelich explained that the purpose of NUREG/CR-1580 was to produce a set of instructions for a utility to identify operator/control room interfaces, compare them with a set of standard criteria or guidelines applicable to control rooms, and on the basis of the comparison, uncover any human engineering deficiencies.

The guidelines in NUREG/CR-1580 were broken into a number of sections which include control room environment, visual displays, controls, workspace, auditory displays, control/display integration, performance aids, and communication.

NUREG/CR-1580 was characterized as basically hardware oriented. It did not identify the operators' role in the control room, or identify "missing" (other) or unneeded components. There was no guidance for integration with other Task Action Plans.

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As a result of the public comment period on NUREG/CR-1580, the Staff summarized, for the Committee, some of the comments they received as follows:

1. the guide was too detailed
2. data requirements are excessive
3. many guidelines were irrelevant
4. guidelines were not specific enough for nuclear power plants
5. more guidance was needed to help utilities prioritize the discrepancies found between guidelines and the control room

Mr. Beltracchi discussed systems reviews, which are a part of the control room design review. These will serve as the basis of the functional review of operation and will help to integrate several items in the Task Action Plan such as procedures upgrading, the use of a safety parameter display system, and the display of post-accident monitoring equipment (Reg. Guide 1.97).

In systems review, the scope will encompass a review of the control room operators' tasks for events like anticipated operational occurrence and postulated emergency conditions.

Mr. Beltracchi discussed the phases of the control room design review. The process begins with identifying operating events with the emphasis on "abnormal and/or emergency operations." The abnormal operation studies should be coupled with postulated multiple failures. Licensees will be asked to define and document all systems and subsystems to facilitate the definition of functions associated with operating events. For

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each operator function, the guidelines will suggest analyzing the function by breaking the function down into operator tasks. This type of study is aimed at revealing the man-machine interface. Reviewers could then proceed with verifying tasks and validating procedures.

When NUREG-0700 is released, the review it describes will have an assessment, design, and implementation section, which will describe how a particular proposed improvement is correlated with operator training requirements, and assurances are reached that a particular improvement does not itself create another human factor's deficiency.

Mr. Moore indicated that the job of planning the tasks to be performed in improving control rooms could be completed in one year. This takes into account the current work load on utilities. He said much of the effort can be done on a generic (non-site), vendor-related basis.

Mr. Moore noted that he would be pleased to accept comments on the draft NUREG-0659 for the next 6-8 weeks from the Committee or its consultants. Mr. Mathis requested those present on the Subcommittee to send any comments to Richard Major, who will compile and forward them to Voss Moore.

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(Congressman Udall's ATWS Concerns Prompted by the Browns Ferry 3 Partial Failure to Scram, June 28, 1980)

In his introductory statement, Mr. Mathis, Subcommittee Chairman, went over the purpose of the meeting. He noted the Subcommittee was meeting with the NRC Staff to begin its review of Rep. Udall's inquiries on ATWS, which were prompted by the June 28, 1980 Browns Ferry 3 partial failure to scram. Mr. Mathis traced the chronology of the correspondence between Rep. Udall and the Commission. He summarized Mr. Udall's concerns as follows:

1. An indication of the level of confidence placed on the Staff's ability to calculate the consequences of an ATWS.

2. The level of confidence in and the adequacy of actions taken subsequent to the Browns Ferry 3 control rod failure. As a second part to this concern, what additional ATWS-related concerns does the Commission and the ACRS deem appropriate to consider?

3. The extent to which emergency procedures at operating plants contain instructions for the operators given an ATWS.

4. An assessment of the causes of the Browns Ferry 3 partial failure to scram.

5. ACRS review of previous Commission responses to Mr. Udall's inquiries.

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Mr. Mathis concluded his opening remarks by noting he hoped to be in a position where the Subcommittee could at least begin formulating a response to Congressman Udall on summary items 2, 3, and 4 mentioned above.

Mr. Check, Office of Nuclear Reactor Regulation, introduced the Staff's presentation for the day. He explained the purpose of the day's presentation was to describe how the NRC dealt with the partial failure to scram event that occurred at Browns Ferry 3. No single element of the Staff had an exclusive responsibility for the issue. Several offices have been heavily involved. He noted that, initially, following an event at an operating reactor, the Office of Inspection and Enforcement has the lead agency role. In this case, I&E had ad hoc assistance provided by NRR and AEOD. Mr. Check noted that the Staff will be trying to convey a sense of the process by which an operating event is handled.

Mr. Panciera presented the overall chronology of Staff actions taken subsequent to the Browns Ferry 3 partial failure to scram. He gave the Subcommittee a perspective on how the Staff responded to the event and the time sequence in which the response occurred. Mr. Panciera noted that, before the Browns Ferry 3 event, I&E, as a result of several

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LERs, had been looking into the problem of level indication in the scram discharge volume (SDV). Both Brunswick and Hatch plants had damaged floats on their SDV level indicating instruments. A bulletin was issued in response to these events. Mr. Panciera described the near term response to the accident and noted the early involvement of both NRR and AEOD in the analysis of the incident. In addition to the near term response, which was the issuing of I&E bulletins, Mr. Panciera described the establishment of a multi-disciplined team to work on the long range solutions to the event. The involvement of both Staff and the BWR owners was described during the evolution of the long term fixes. The evolution of the reports by AEOD and the evaluations contained in the generic SER were explained, as well as, the issuance of additional supplements to the I&E bulletins. The close coupling of effort between the various Staff offices and BWR owners groups was stressed.

Mr. Mills, Office of Inspection and Enforcement, discussed the scram system design for a boiling water reactor, the sequence of events for the Browns Ferry 3 partial failure to scram, and identification of the causes. Mr. Mills explained that when a scram signal is received, the scram outlet valves open just before the scram inlet valves. Water present in the area above the control rod drive piston is vented and a

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higher water pressure is applied to the bottom side of the piston, driving the control rod into the core. As the control rod is driven into the core, water is displaced from the area above the drive piston and flows into the scram discharge volume. About 3/4 of a gallon of water is displaced above each control rod drive, the scram discharge volume is sized to receive about 3 1/3 gallons per drive. Once a scram is initiated, seal leakage around each control rod drive mechanism occurs. Reactor water, from the vessel, through the seals, flows into the the scram discharge volume. If the scram signal is not reset within a few minutes, the scram discharge volume will fill with water and pressurize to the reactor vessel pressure. When an operator takes manual action to reset a scram, this closes the scram inlet and outlet valves and opens the vent and drain valves. The system will drain and be capable of receiving water from the next scram.

On June 28, 1980, Browns Ferry 3 was in the process of shutting down for routine maintenance on the feedwater system. The power level of Browns Ferry 3 was approximately 35%. On the first manual scram, control rods on the west side of the reactor core fully inserted, however, 75 control rods on the east side did not fully insert. The reactor power level was reduced to about 2%. The operator reset the scram signal and tried a second manual scram.

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The rods on the east side moved an average of 12 inches, 33 rods were fully inserted. The operator again reset the scram signal, and a third manual scram was executed, rods on the east side moved an average of 7 inches, 47 rods fully inserted. Once again the operator reset the scram signal. The reactor automatically scrammed on a high scram discharge volume level signal, all rods fully inserted. It took 14 minutes, from the start of the sequence (the first scram attempt), until the control rods were fully inserted. Following this incident, support people were immediately called to the site to begin an investigation to determine the cause of the partial scram. The testing and evaluation performed on the day of the event included a check of the valve alignment on the control rod drive system. Correct alignment was verified. The east bank vent valve operability was also verified. A survey of the drain lines that connect the east scram discharge volume to the instrument volume was conducted, no indication of blockage was found. A survey of the drain sumps was conducted. Again, the purpose of the survey was to inspect for foreign objects or debris that might have been an indication of blockage. No indication of blockage was found. A calibration check was performed on the level switches on the scram discharge instrument volume. Two problems were found. Two level switches were out of calibration during the check. However, during the event itself, these switches did actuate.

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An evaluation of the electrical systems, which initiates a scram, was conducted. Based on a number of tests, it was clear that an electrical malfunction could not have created the west only scram.

I&E concluded it was the retention of water in the east scram discharge volume that caused the partial scram. The cause of the water retention was not determined. The Staff concluded that generic action was required immediately following the event. This action consisted of verifying at BWRs that the scram discharge volume was fully operable and that the scram discharge volume is periodically checked to make sure it is empty. This was the basic philosophy behind the bulletins issued shortly after the Browns Ferry 3 event.

Mr. Rubin of AEOD discussed that office's investigations and activities since the Browns Ferry 3 partial failure to scram. Within a few days after the Browns Ferry event, AEOD technical representatives went to the site as part of an NRC team to begin to gather information about the event, the scram system design, and results of systems tests and inspections performed by TVA. With this initial contact, AEOD began its own individual investigation of the Browns Ferry event; its causes and lessons learned.

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AEOD concluded as did the other offices, that the reason for the Browns Ferry 3 partial failure to scram was due to the scram system hydraulics. The observed rod motion was best explained on the basis of at least a partially filled scram discharge volume. Tests performed by GE at San Jose showed that the drainage rate of the east scram discharge volume was consistent with the average rod motion that occurred during the scram attempts. The rod motion was consistent with expectations, given the amount of free volume made available by drainage.

Mr. Rubin explained how it was possible for water to accumulate in the in the scram discharge volume header and not scram the reactor as a result of high water level in the scram instrument volume (SIV). The vent line between the scram discharge header and the instrumented volume drops only 1 ft. 7 in. over a total length of 150 ft. Tests were done to determine the draining characteristics of both the east and west scram discharge volume systems. Both headers were filled with room temperature water with the vent valves open. At time zero, the instrumented volume was opened and both headers were allowed to drain simultaneously. The west header emptied in 9 1/2 min. The east header took 25 min. before it finally emptied. The slower drainage characteristic of the east header allowed the instrumented volume to drain, clearing high water indication

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instruments before the east bank had drained. AEOD concluded that the drainage rate of the west header is about 35 gpm, and the east header drains at about 11.6 gpm, while the average drain rate of the instrumented volume, based on the rate of clearing the instrument switches is about 24.5 gpm.

Mr. Rubin summarized the findings of the study by AEOD. The findings are as follows:

1. Water in the east scram discharge volume header is the likely cause of the scram system failure.

2. The scram instrument volume high level scram function did not provide protection against an accumulation of water in the east scram discharge volume header, for normal venting and draining of the header.

3. A single blockage could disable, both east and west discharge volume header protection, if the faster draining line is plugged, its lack of contribution would prevent the instrumented volume from filling and giving a scram signal.

4. With the current scram discharge volume design, a blockage in the vent or drain path can cause water to accumulate and at the same time disable the protection function.

5. The current scram discharge instrument volume results in the automatic high level scram safety function being dependent on the nonsafety related reactor building clean radwaste drain system. Venting of the instrumented volume is controlled by the downstream clean radwaste drain system characteristics.

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6. There are numerous sources of water which can fill the scram discharge system if drainage does not occur. Possible sources of water are from previous scrams, multiple scram outlet valve leakage, and injection from the scram discharge volume flush lines. Mechanisms which can trap water in the scram discharge volume include blockage of vent piping; a plugged line leading from the scram discharge volume into the scram instrumented volume; or a closed vent valve. The specific mechanism which caused the Browns Ferry 3 problem is not known, however, enough mechanisms can be postulated to cause a concern.

7. Float type level switches have been unreliable.

8. Re-scram attempts are not always possible.

9. A blowdown can occur outside of primary containment, if a vent or drain valve remains open during a scram.

10. There was no emergency procedures for a scram system failure at Browns Ferry 3.

There were five recommendations resulting from the AEOD initial investigation into the Browns Ferry 3 partial failure to scram. These recommendations were:

1. SDV system protective function should not depend on vent or drain arrangements. This recommendation is consistent with new design requirements which will combine the scram discharge volume and scram instrumented volume.

2. Provide diverse water level monitoring instruments.

3. Provide redundant SDV system vent and drain valves. This recommendation is to provide extra protection to prevent an unisolatable blowdown outside primary containment.

4. Provide emergency operating procedures for scram system failures.

5. Consider improving SDV system drain reliability.

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Mr. Rubin presented the four conclusions to the AEOD investigation. These conclusions were:

1. Water in the east SDV caused the Browns Ferry 3 scram failure.
2. The current scram capability protection system is unacceptable.
3. Given a single valve failure, the potential exists for an unisolatable blowdown outside containment.
4. The SDV system will require modification to reduce ATWS risk.

Mr. Rubin discussed an AEOD study on the potential for control air and scram system interaction. The concern arises as a result of the effects of degraded air on the scram outlet valves. If the control air pressure were to drop slightly below 45 psi, the scram outlet valves could partially open. Flow passing the control rod drive seals, at the rate of 1-2 gpm, could occur without significant rod motion for a partially opened scram outlet valve. The accumulated flow rate of 93 scram outlet valves could be in excess of the drainage rate of the scram discharge volume header. Water could accumulate in the header as the result of this degraded air situation. As the SDV headers fill with water, and automatic scram has not occurred due to poor hydraulic coupling between the SDV and SIV, a concern is raised for approaching a situation in which the reactor cannot scram. At the same time, the degraded control air supply would be adversely affecting other regulating valves in the plant, e.g., the feedwater system. Thus, a plant transient

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such as a water level drop in the reactor, could also be initiated eventually leading to need to scram. This scenario considered in its entirety shows the plant within a few minutes evolving towards and ATWS, because of degraded air conditions.

Mr. Rubin explained that in the long term, the combination of the SDV and the SIV will alleviate concerns over loss of control air situations. In the near term, additional surveillance and level indication is being required for the SDV and SIV systems. Bulletins have required operators to manually scram the reactor on indications of loss of control air. An automatic scram on degraded control air was required by the Staff.

Mr. Graves discussed a BWR plant transient analysis program performed at Brookhaven National Laboratory. Mr. Graves noted that in recent years the NRC in conjunction with technical assistance from BNL, has developed a reasonable capability of analyzing the consequences of a full ATWS. This capability has been used in calculations for selected ATWS events in BWR-4 type plants. The calculations had been performed to improve the Staff's understanding of the consequences of ATWS events and to formulate the Staff position with respect to the ATWS rule now under consideration.

Following the Browns Ferry 3 partial failure to scram, the Staff asked Brookhaven to conduct some calculations of the consequences of a similar incident. This program will be conducted during FY 81 and FY 82.

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A second part of this program is for BNL to prepare input tapes that model typical BWR 3s, 5s and 6s for ATWS and other transient consequences.

The objectives of the BNL program are to develop the capability to audit vendor and licensee analyses, develop capabilities to perform confirmatory analyses of all BWRs to determine the safety impact of operating transients and to provide a better basis for decisions involving operating reactors. Further objectives are to develop a better understanding of the transient/accident behavior response of BWRs for developing emergency guidelines and plant operating procedures, and independent audit assessment of the adequacy of safety features. For the case of the main steam isolation valve closure plus a Browns Ferry 3 partial scram at full power, the critical parameter became the heat load to the suppression pool. Mr. Graves noted that a full ATWS would be a much more severe event than a partial failure to scram. He noted that, in the past, a series of calculations had been performed, which would show the consequences of a full ATWS and the results of fixes intended to correct the situation. The calculations performed for a partial failure to scram as occurred at Browns Ferry 3 indicated that consequences were mild enough so that operator action could be taken in order to avoid serious consequences.

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Mr. Mills discussed the short term actions necessary to justify continued operation of BWRs and long term actions needed to provide the SDV design with improved reliability. He also discussed BWR ATWS-related procedures and modifications. He noted that I&E Bulletin 80-17 was sent from I&E Headquarters within 5 days after the Browns Ferry event. The main thrust of this bulletin was to keep the scram discharge volume empty and operable.

Mr. Mills described a number of deficiencies that were discovered in scram systems as a result of a response to Bulletin 80-17. Some of the deficiencies discovered included crushed floats in the high level alarm and rod block instruments and scram discharge volume high level scram instruments. (These events were discovered before the Browns Ferry 3 incident.) Additional deficiencies included scram discharge volumes that did not drain properly at several plants. Mr. Bender asked for additional information to clarify how these deficiencies might affect a Browns Ferry type event. Mr. Mills discussed some of the requirements of Bulletin 80-17, Supplement 1, and noted that, among other items, this Supplement required that a continuous monitoring system be installed in the scram discharge volume by September 1st of 1980. The Supplement also required a design review of the vent system by September 1st, and procedural controls for the availability and use of the standby liquid control systems.

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Bulletin 80-17, Supplement 2 required, "each BWR with a scram discharge volume vent system, that depends on any component other than the vent valve alone for proper venting, must provide an alternative vent path continuously open to the building atmosphere within 48 hours of notification to continue operation. It must be positive in its functions at all times." This requirement was to eliminate the potential that a vent problem would result in retaining water in the scram discharge volume. As a result of this requirement, about 15 plants modified their vents.

Supplement 3 to Bulletin 80-17 was issued after the concern raised by AEOD concerning a loss of control air effect, that could result in the loss of scram capability. Supplement 3 requires the operators to manually scram in the event of loss of control air.

The responses to the bulletin supplement requiring a schedule for installation of a continuous monitoring system were not definitive. Confirmatory orders were issued which required all plants to begin installing by December 1st a continuous monitoring system to detect the presence of water in the scram discharge volume.

I&E Bulletin 80-17, Supplement 4 required in-place operability testing of the continuous monitoring system with water in the the SDV. The Bulletin also required periodic surveillance testing of the continuous monitoring system. This Bulletin corrected some installation problems that had been discovered in the continuous monitoring systems.

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One of the items in Bulletin 80-17 was a requirement for plants to have ATWS operating procedures. I&E conducted a survey of all operating reactors and procedures were inspected for their acceptability with regards to responding to ATWS events. Mr. Mills reported that all BWRs were found to have acceptable procedures. Mr. Mills concluded that as result of the Bulletin, corrective actions had been taken to ensure that the SDV is maintained during power operation. Corrective actions taken are necessary and sufficient to justify continued operation. Long term action to improve the scram system is necessary and will be performed.

Mr. Schwenk of the I&E Staff discussed the results of the survey to determine the adequacy of licensee emergency operating procedures to respond to an ATWS event at PWRs. Guidance was supplied from I&E headquarters to the resident inspectors in the form of guidelines to compare ATWS procedures against. The results of the survey indicated that 20 plants had procedures with no exceptions to the inspection requirements. Five plants meet the inspection requirements, but did not have them labeled as specific ATWS procedures. Twenty plants had some minor exceptions to inspection requirements.

Mr. Rubin described AEOD's assessment of the interim protective measures at Browns Ferry 3 required by the first I&E bulletin. These are the measures which were put in place a few weeks after the event and were

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intended to provide a basis for assuring continued safe operation of the plant, pending long term hardware modifications to the SDV system. AEOD's findings were that the then existing interim system, which involved a newly-installed ultrasonic water detection equipment and special procedures did not restore the level of scram capability protection thought to be assured in the original design. However, these temporary arrangements were felt to be adequate for sources for water which would involve slow water accumulation in the SDV headers. For fast-fill scenarios of the SDV, and in particular for degraded control air situations, the interim measures in place at the time AEOD did its review were considered to be less than adequate. Accordingly, AEOD made a recommendation for an immediate, manual scram required solely on the basis of an indication of low control air pressure in the control room. AEOD also felt it was necessary to move the UT monitoring indication into the control room to improve operator response time. AEOD felt that consideration should be given to providing an automatic scram signal based on degrading control air pressure.

Mr. Panciera discussed the development of the generic SER. A number of regional meetings were held in July and August of 1980. The objective of these regional meetings was to obtain an in-depth understanding of the as-built conditions of scram discharge volume, instrumented volume, interconnecting piping, and vent and drain systems.

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Mr. Panciera noted that a BWR Owners Group was formed around the 20th of August 1980 to address the problem with the hydraulics of the scram discharge volume. By the 19th of September, the Owners Group had developed criteria that they felt addressed all the problems that were uncovered by the Browns Ferry event and the problems uncovered at Hatch and Brunswick concerning crushed scram level indicating instrument floats. The Staff reviewed the early criteria and made comments. The Owners Group submitted a revised set of criteria on October 15th. As the result of two rounds of review, the Staff's SER, in effect, endorses the criteria developed by the BWR Owners.

Mr. Panciera discussed the sections of the SER which addressed justification for continued operation and the long term program. The justification for continued operation was based on an evaluation of the licensee is compliance with Bulletin requirements, recommended short term modifications, and plant-specfic modifications. The Staff addressed the fast-fill of the SDV scenario that could result from a degraded control supply air by a requirement to automatically scram the reactor when air pressure reaches 10 psi above the scram discharge volume actuation setpoint or if other indications of degraded air become apparent. A specific requirement to install an air dump valve which will automatically scram the reactor when pressure reaches a point of 10 psi above the scram

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outlet valve setpoint pressure was an interim measure contained in the SER. The basis for continued operation was satisfaction of all the Bulletin requirements as well as implementing the short term modification of an air dump valve. Once an improved hydraulic coupling in the scram discharge volume and scram instrumented volume is attained there will be no need for such a scram. Mr. Panciera discussed long term requirements. The functional criteria for the scram discharge volume was to have sufficient capacity to receive and contain water exhausted by a full reactor scram without adversely affecting control rod drive scram performance. Mr. Panciera also discussed safety criteria for the long term fixes. There are 5 such criteria, including:

1. No single active failure of a component or service function shall prevent a reactor scram under the most degraded conditions that are operationally acceptable.
2. No single active failure shall permit uncontroled loss of coolant.
3. The scram discharge system instrumentation shall be designed to provide redundancy to operate reliably under all condition, and shall not be adversely affected by hydrodynamic forces or flow characteristics.
4. System operating conditions, which are required for a scram, shall be continuously monitored.
5. Repair, replacement, adjustment, or surveillance of any system component shall not require the scram function to be bypassed.

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Also included in the SER were a number of operational criteria. These five criteria were:

1. Level instrumentation shall be designed to be maintained, tested, or calibrated during plant operation without causing a scram.
2. The system shall include sufficient supervisory instrumentation and alarms to permit surveillance of system operation.
3. The system shall be designed to minimize the exposure of operating personnel to radiation.
4. Vent paths shall be provided to assure adequate drainage in preparation for scram reset.
5. Vent and drain functions shall not be adversely affected by other system interfaces. The objective of this requirement is to preclude water backup in the scram instrument volume which could cause spurious scrams.

Mr. Panciera explained the design criteria specified in the SER. These criteria established the need for good hydraulic coupling between the scram discharge volume and the instrumented volume. Mr. Panciera also explained the surveillance criteria for the scram discharge system.

Mr. Pittman of the Division of Systems and Reliability Research Staff discussed the review of the two basic BWR designs performed by that group. Both the single instrument volume and the dual instrument volume (coupled SDV and SIV system) were reviewed with an eye toward additional improvements which

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Mr. Pittman of the Division of Systems and Reliability Research Staff discussed the review of the two basic BWR designs performed by that group. Both the single instrument volume and the dual instrument volume (coupled SDV and SIV system) were reviewed with an eye toward additional improvements which could be made in future plants. Basically, the findings from DSSR supported those earlier findings of AEOD and NRR, highlighted in the SER. Mr. Pittman reiterated that the new design provides an instrumented

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volume attached directly to the headers of the scram discharge volume. This design eliminates the hydraulic coupling between the header and the instrumented volume.

Mr. Rubin described additional AEOD BWR scram system investigations. Since the Browns Ferry 3 case study, AEOD has extended their initial review to include a more thorough study of the safety concerns associated with single passive failures, i.e., pipe breaks in the scram discharge volume system. The two points under review during this extension of the study is the ability of the rector coolant boundary to isolate and the primary containment isolation function.

The Subcommittee held a brief executive session following the prepared presentations. During the executive session the Subcommittee decided to explore the calculational capabilities of the Staff and their contractor, Brookhaven National Laboratory, during the next Subcommittee meeting. The ability of the Staff to predict the consequences of an ATWS during both a full ATWS and a partial failure to scram will be the topics of the meeting. The meeting will focus primarily on ATWS scenarios associated with BWRs. The Subcommittee agreed to meet on the afternoon of April 8, 1981; the meeting is to take place in Washington, DC.

The meeting was adjourned at 5:45 p.m.

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NOTE: For additional details, a complete transcript of the meeting is available in the NRC Public Document Room, 1717 H St., NW, Washington, DC 20555 or from Alderson Reporters, 300 7th St., SW, Washington, DC, (202) 554-2345.

F. *NRC Degraded Core Rulemaking*—ACRS position/action re proposed rule.

G. *North Anna Nuclear Power Station Unit 2*—decay heat removal systems.

H. *Meeting with NRC Chairman, NRC Commissioners and the EDO*—discuss safety related issues such as reaction to implemention of ACRS recommendations on the safety research program, proposed revision of the fission product source term used in the siting and design of nuclear plants, and ACRS comments on the proposed NRC Long Range Safety Research Program.

I. *Reports of ACRS Subcommittees and Members*—status of ACRS review of matters such as the proposed prelicensing review of a passive containment system, status of generic items applicable to LWRS, control system failures that could cause or exacerbate nuclear power plant accidents, and the ATWS resolution taking into account experience at the Browns Ferry Nuclear Power Plant.

J. *Reports and briefings by representatives of the Department of Energy (DOE) and NRC*—application of Three Mile Island Unit 2 lessons learned to DOE facilities and an independent design review program implemented by NRC.

K. *Fission Product Source Term*—ACRS review of the fission product source term used in the siting and design of nuclear facilities.

April 9–11, 1981: Agenda to be announced.

May 7–9, 1981: Agenda to be announced.

Dated: February 13, 1981.

John C. Hoyle,

Advisory Committee Management Officer

[FR Doc. 81-5761 Filed 2-19-81; 8:45 am]

BILLING CODE 7590-01-M

Advisory Committee Reactor Safeguards; Subcommittee on Reactor Operations; Meeting

The ACRS Subcommittee on Reactor Operations will hold a meeting on Monday and Tuesday, March 9–10, 1981 at 1717 H Street, N.W., Washington, DC in Room 1046. The Subcommittee will hear a briefing on the NRC Staff's Human Engineering Guide to Control Room Evaluation and will begin work on a response to recent inquiries by Congressman Udall on ATWS.

In accordance with the procedures outlined in the Federal Register on October 7, 1980 (45 FR 66535), oral or written statements may be presented by members of the public, recordings will be permitted only during those portions of the meeting when a transcript is being kept, and questions may be asked only by members of the Subcommittee, its consultants, and Staff. Persons desiring to make oral statements should notify the Designated Federal Employee as far in advance as practicable so that appropriate arrangements can be made to allow the necessary time during the meeting for such statements.

The entire meeting will be open to public attendance except for those sessions during which the Subcommittee finds it necessary to discuss proprietary and Industrial Security information. One or more closed sessions may be necessary to discuss such information. (Sunshine Act Exemption 4.) To the extent practicable, these closed sessions will be held so as to minimize inconvenience to members of the public in attendance.

The agenda for subject meeting shall be as follows:

Monday, March 9, 1981—1:00 p.m. until the conclusion of business

Tuesday, March 10, 1981—8:30 a.m. until the conclusion of business

During the initial portion of the meeting, the Subcommittee, along with any of its consultants who may be present, will exchange preliminary views regarding matters to be considered during the balance of the meeting.

The Subcommittee will then hear presentations by and hold discussions with representatives of the NRC Staff, their consultants, and other interested persons regarding this review.

Further information regarding topics to be discussed, whether the meeting has been cancelled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefor can be obtained by a prepaid telephone call to the cognizant Designated Federal Employee, Mr. Richard K. Major (telephone 202/634–1414) between 8:15 a.m. and 5:00 p.m., EST.

I have determined, in accordance with Subsection 10(d) of the Federal Advisory Committee Act, that it may be necessary to close some portions of this meeting to protect proprietary and Industrial Security information. The authority for such closure is Exemption (4) to the Sunshine Act, 5 U.S.C. 552b(c)(4).

Dated: February 13, 1981.

John C. Hoyle,

Advisory Committee Management Officer

[FR Doc. 81-5762 Filed 2-19-81; 8:45 am]

BILLING CODE 7590-01-M

Advisory Committee Reactor Safeguards; Subcommittee on Virgil C. Summer Nuclear Station; Change of Location

The ACRS Subcommittee on Virgil C. Summer Nuclear Station will hold a meeting on February 26–27, 1981. The meeting location has been changed to the Capitol Inn (803/252–3100), 1901 Assembly Street, Columbia, SC. Thursday, February 26, 1981 at 2:00 p.m. and Friday, February 27, 1981 at 8:30 a.m. until the conclusion of business each day instead of the Holiday Inn-Northwest, US–1 & I–26, Columbia, SC.

All other items regarding this meeting remain the same as announced in the Federal Register published Wednesday, February 11, 1981.

Further information may be obtained by a prepaid telephone call to the cognizant Designated Federal Employee for this meeting, Mr. Paul Boehnert (telephone 202/634–3267) between 8:15 a.m. and 5:00 p.m., EST.

Dated: February 17, 1981.

John C. Hoyle,

Advisory Committee Management Officer

[FR Doc. 81-5763 Filed 2-19-81; 8:45 am]

BILLING CODE 7590-01-M

[Docket No. 50-255]

Consumers Power Co.; Issuance of Amendment to Provisional Operating License

The U.S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 64 to Provisional Operating License No. DPR-20, issued to Consumers Power Company (the licensee), which amended the license for operation of the Palisades Plant (the facility) located in Covert Township, Van Buren County, Michigan. The amendment is effective as of its date of issuance.

The amendment revises Paragraph 3.E of the license to incorporate Supplement Nos. 1 and 2 to the Fire Protection Safety Evaluation.

The filings comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this action was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR

POOR ORIGINAL

Attachment A

MEETING DATE: MARCH 9 & 10, 1981

SUBCOMMITTEE MEETING: REACTOR OPERATIONS

LOCATION: ROOM 1046 - WASHINGTON, DC

Attachment B

POOR ORIGINAL

ATTENDANCE LIST

PLEASE PRINT

	NAME	AFFILIATION
1.	W. MATHIS	ACRS
2.	J RAY	"
3.	D WARD	"
4.	J. BUCK	CONSULTANT
5.	WIKOSOLING	"
6.	I COTTON	"
7.	W. LIPINSKI	"
8.	[illegible]	NRC / [illegible]
9.	[illegible]	NRC / HFEB
10.	R. T. Eckenrode	" "
11.	[illegible]	NRC / HFEB
12.	R. W. FROELICH	NRC/DHFS
13.	J. J. KRAMER	NRC/DHFS
14.	V. A. MOORE	NRC/DHFS
15.	S.H. HANAUER	LUND CONSULTING INC
16.	L.C. HECHT	KINTON, INC.
17.	S.E. ZACH	Westinghouse NTD.
18.	F W Damerow	AIF
19.	A.C. BIVENS	INPO
20.	Jack Vogler	DYNATREND INC.
21.	John Polutchko	KMC, INC
22.	Tom Houghton	NOC
23.	JOHN STAMPELOS	NRC / RSSB
24.	ELLIS W. MERSCHOFF	

MEETING DATE: MARCH 9 & 10, 1981

SUBCOMMITTEE MEETING: REACTOR OPERATIONS

LOCATION: ROOM 1046 - WASHINGTON, DC

ATTENDANCE LIST

POOR ORIGINAL

PLEASE PRINT

NAME	AFFILIATION
1. R.H. WHITE	DUKE POWER CO
2. EUGENE B. SILVERMAN	ARD CORPORATION
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POOR ORIGINAL

MEETING ROOM: 1046

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS MEETING
ON
REACTOR OPERATIONS
MARCH 9 & 10, 1981
WASHINGTON, DC

PLEASE PRINT

ATTENDEES PLEASE SIGN BELOW

	NAME	BADGE NO.	AFFILIATION
1.	R H WHITE	E-0151	DUKE POWER Co.
2.	J. G. STAMPELOS	E-0152	NSOC
3.	W. C. LIPINSKI	E-0154	ANL
4.	Jane Beach	E-0155	Alderson Reporting Co.
5.	Frederick H Dameron	E-0156	Westinghouse F-1 Co.
6.	James R. Buck	E-0160	Iowa University
7.	A. C. BIVENS	E-0161	AIF
8.	JACK VOYLES	E-0162	INPO
9.	SARAH E ZAUT	E0163	KINTON INC
10.	LINDA C. Hecht	E0164	LUND CONSULTING INC
11.	Leyse	E0165	EPRI
12.	JOHN POLLITCHEO	E0166	DYNATRONO
13.	WM KEYSERLING	E0167	HARVARD U
14.	TC Houghton	E-0168	KMC
15.	EUGENE B. SILVERMAN	E-0169	ACO CORPORATION
16.	Ann R. Ley	E-0170	Alderson Reptg.
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MEETING ROOM: 1046

POOR ORIGINAL

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS MEETING
ON
REACTOR OPERATIONS

MARCH 9 & 10, 1981
WASHINGTON, DC

PLEASE PRINT

ATTENDEES PLEASE SIGN BELOW

NAME	BADGE NO.	AFFILIATION
1. Ann Riley	E-0160	Aldison Resta. A.
2. WALTER C. LIPINSKI	E-0156	ANL
3. James R. Buck	E-0154	The University of Iowa
4. [illegible]		
5. Leyse	E-0169	EPRI
6. Steve Kline	E-0170	Bechtel Power Corp.
7. Perry Seiffert	E-0155	Dow & Munzing
8. Thomas C Houghton	E 0163	KMC
9. William G. Gibbard	E 0165	Pennsylvania Power & Light Co
10. W. [illegible]	E 0166	NUS
11. JOHN STAMPEDES	E-0101	NSOC
12. DAVID C. CAMPBELL	E-0168	ORNL
13. Tom Beach	E-0151	Westech
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MEETING DATE: MARCH 9 & 10, 1981

SUBCOMMITTEE MEETING: REACTOR OPERATIONS

LOCATION: ROOM 1046 - WASHINGTON, DC

ATTENDANCE LIST

POOR ORIGINAL

PLEASE PRINT

	NAME	AFFILIATION
1.	W. MATHIS	ACRS
2.	J. RAY	"
3.	D WARD	"
4.	W Kerr (PART TIME)	"
5.	J. Buck	CONSULTANT
6.	W. Lipinski	"
7.	J GATTON	IE HQ Staff
8.	E. Mills	" " "
9.	G. Schwenk	RES/SER STAFF
10.	J. PITTMAN	NRR/DSI
11.	V. PANCIERA	NRR
12.	P.S. CHECK	IE HQ
13.	E L Jordan	NRR/ATRB
14.	M. G. Slaughan	NRR/DSI
15.	J. Loomis	AEOD
16.	G. Lanik	AEOD
17.	C. Michelson	AEOD
18.	S Rubin	Pennsylvania Power + Light Co.
19.	W.G. Gibbard	APC Inc
20.	T C [illegible]	BECHTEL POWER CORP.
21.	S.W. KLINE	NUS, INC
22.	W Arnold	EPRI
23.	R. Leyse	
24.		

TENTATIVE SCHEDULE
FOR THE
MARCH 9 & 10, 1981
ACRS SUBCOMMITTEE MEETING ON REACTOR OPERATIONS
1717 H ST., NW
WASHINGTON, DC

MONDAY, MARCH 9, 1981

APPROXIMATE TIME	
1:00 p.m.	I. OPENING REMARKS a. Discussion of Schedule b. Meeting Goals
1:15 p.m.	II. BRIEFING BY THE DIVISION OF HUMAN FACTORS SAFETY TOPIC: HUMAN ENGINEERING GUIDE TO CONTROL ROOM EVALUATION (NUREG/CR-1580) Detailed agenda to be provided by Division of Human Factors Safety
5:00 p.m.	RECESS

Attachment C

TENTATIVE SCHEDULE

ACRS SUBCOMMITTEE MEETING ON REACTOR OPERATIONS

TUESDAY, MARCH 10, 1981

APPROXIMATE TIME		
8:30 a.m.	1. OPENING REMARKS	
8:45 a.m.	2. OPENING STAFF COMMENT	(P. Check)
8:50 a.m.	3. CHRONOLOGY OF STAFF ACTIONS	(V. Panciera)
9:10 a.m.	4. PRINCIPLES OF OPERATION AND SCRAM SYSTEM DESIGN	(W. Mills)
9:25 a.m.	5. BF-3 EVENT-SEQUENCE OF ACTIONS AND PRELIMINARY IDENTIFICATION OF CAUSE	(W. Mills)
9:40 a.m.	6. AEOD INVESTIGATION OF BF-3 EVENT	(S. Rubin)
10:40 a.m.	7. POTENTIAL FOR UNACCEPTABLE CONTROL AIR-SCRAM SYSTEM INTERACTION	(S. Rubin)
10:55 a.m.	8. IE BULLETIN REQUIREMENTS	(W. Mills)
11:25 a.m.	9. IE SURVEY OF ATWS PROCEDURES	(W. Mills, G. Schwenk)
12:00 noon	LUNCH	
1:00 p.m.	10. ATWS CALCULATIONS	(T. Spies)
1:15 p.m.	11. INTERIM MEASURES AT BROWNS FERRY TO PREVENT WATER ACCUMULATION IN SDV	(S. Rubin)
1:30 p.m.	12. DEVELOPMENT OF SER	(V. Panciera)
1:45 p.m.	13. GENERIC SER - JUSTIFICATION FOR CONTINUED OPERATION	(V. Panciera, M. Goodman)
	1. Evaluation of Bulletin Responses 2. Short Term Modifications 3. Human Factors Consideration	
2:15 p.m.	14. GENERIC SER - LONG TERM MODIFICATIONS	(V. Panciera)
	1. Criteria 2. Acceptable Means of Compliance 3. Implementation	

APPROXIMATE TIME		
3:00 p.m.	15. SCRAM RELIABILITY EVALUATION	(J. Pittman)
3:50 p.m.	16. ONGOING AEOD SCRAM DISCHARGE VOLUME SYSTEM REVIEW ACTIVITIES	(S. Rubin)
4:00 p.m.	17. OPEN EXECUTIVE SESSION	
	ADJOURNMENT	

LIST OF DOCUMENTS PROVIDED AT MEETING

1. Tentative Meeting Schedule
2. Slides used by V. Moore on Development Guidelines and Criteria for Control Room Design Review (7 slides)
3. Slides used by R. Froelich, Guidelines Development - Control Room Design Review (22 slides)
4. Slides used by L. Beltracchi, Systems Review (5 slides)
5. Advance Draft Copy of NUREG-0659 "Staff Supplement to the Draft Report on Human Engineering Guide to Control Room Design"
6. Slides used by V. Panciera, Chronology of Staff Actions (2 slides)
7. Slides used by W. Mills, Browns Ferry 3 (Partial Scram - June 28, 1980) (11 slides)
8. Slides used by C. Graves, BWR Plant Transient Analysis Program at Brookhaven National Lab. (7 slides)
9. Slides used by W. Mills, I&E Bulletins (13 slides)
10. Slides used by G. Schwenk, Survey by Residen Inspectors to Determine the Adequacy of Licensees Emergency Operating Procedures to Respond to ATWS Events (4 slides)
11. Slides used by G. Schwenk, Emergency Instruction, I-4.3, Reactor Trip (4 slides)
12. Slides used by V. Panciera, SER Development (18 slides)
13. Slides used by J. Pittman, Scram Reliability Evaluation (10 slides)
14. Slides used by S. Rubin, AEOD Investigations and Activities Since the Browns Ferry 3 Scram System Failure (32 slides)

Attachment D