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~~CONFIDENTIAL~~

February 6, 1985

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)
)
THE CLEVELAND ELECTRIC)
ILLUMINATING CO. ET AL.)
)
(Perry Nuclear Power Plant,)
Units 1 and 2))

Docket Nos. 50-440 OL
50-441 OL

OFFICE OF GENERAL INVESTIGATION
DOCKET SERVICES
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50-441

OCRE RESPONSE TO STAFF MOTION FOR SUMMARY DISPOSITION OF ISSUE 8

I. INTRODUCTION

On January 28, 1985, the NRC Staff moved for summary disposition of Issue #8, concerning hydrogen control. The "basis" for the Staff's action is the incorrect wording of the issue. Staff now claims that Issue #8 only concerns recombiners, which are not designed to cope with the large amounts of hydrogen resulting from a degraded core accident.

As is demonstrated by the discussion below and by the attached affidavit of Susan L. Hiatt, the Staff's motion is entirely lacking in merit, is woefully tardy, and is based upon a blatant misrepresentation of the facts of this case.

Intervenor Ohio Citizens for Responsible Energy ("OCRE") urges that the motion be denied.

Since the Staff has not addressed the merits of the hydrogen control system for degraded core accidents at Perry, OCRE will not address itself to these matters either, but will confine its response to the arguments raised in the Staff's motion. Should

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any party move for summary disposition of the issue on its merits, OCRE reserves the right to file a substantive reply. OCRE also reserves the right to respond to new facts and arguments which Applicants may raise in their answer to the Staff's motion. 10 CFR 2.749(a).

II. STANDARDS FOR SUMMARY DISPOSITION

The Staff has correctly stated that the burden of proof lies upon the movant for summary disposition, who must demonstrate that no genuine issues of material fact exist. Staff's Motion at 2-3. In fact, the record and pleadings must be viewed in the light most favorable to the opponents of summary disposition. Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), LBP-74-36, 7 AEC 877 (1974).

In an operating license proceeding, where significant health and safety or environmental issues are involved, a Licensing Board should grant a motion for summary disposition only if it is convinced that the public health and safety or the environment will be satisfactorily protected. Cincinnati Gas and Electric (Wm. H. Zimmer Nuclear Station), LBP-81-2, 13 NRC 36, 40-41 (1981).

It also must be recalled that summary disposition of a safety issue cannot be granted until the Staff has issued its Safety Evaluation Report on that issue. Duke Power Co. (Wm. B. McGuire Nuclear Station, Units 1 and 2), LBP-77-20, 5 NRC 680 (1977).

Finally, 10 CFR 2.749(d) states that

(b) the presiding officer shall render the decision sought if the filings in the proceeding, depositions, answers to interrogatories, and admissions on file, together with the statements of the parties and affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a decision as a matter of law.

Thus, the Licensing Board must consider the entire record on Issue #8 when deciding the Staff's motion.

In light of these standards, the Staff's motion utterly fails. It conveniently neglects the history of Issue #8 by seizing on the erroneous wording of the issue. It also fails to demonstrate that the public health and safety will be protected.

III. THE STAFF'S MOTION IS ENTIRELY LACKING IN MERIT

The Staff has taken a narrow, literal interpretation of the wording of Issue #8, which only specifically mentions recombiners as a hydrogen control system, in arguing against the issue. The Staff claims that, since recombiners are not designed to control large amounts of hydrogen, no issue has been raised by the contention. The Staff further claims the distributed igniter system, which is designed to accommodate large amounts of hydrogen (but is of unproven efficacy), is not challenged by Issue #8.

As is demonstrated by the attached affidavit, this view neglects the history of the issue and the record, especially discovery, of this proceeding. The Commission's regulations expressly require summary disposition motions to be decided in light of the entire record. 10 CFR 2.749(d).

This Licensing Board has always taken this approach. E.g., compare the Board's response to Staff assertions that the Board, in deciding the summary disposition motion on quality assurance, had admitted new contentions beyond the scope of the original contention:

We would also admit the Comstock allegation at the summary disposition stage regardless of whether it were causally related to the initial contention. Contentions set the stage for discovery. They limit, to some extent, the scope of discovery. However, if an intervenor discovers a genuine issue of fact that reflects on plant safety, then it can establish a genuine issue of fact for trial. The principle is similar to modern federal practice in which pleadings are considered amended as proof shifts.

A less flexible rule of practice would be inappropriate for our proceedings. To throw out a genuine issue of fact, uncovered during discovery, on technical grounds, would be antithetical to the Commission's role of protecting the public and antithetical to the Board's role of addressing legitimate grievances raised by an intervenor during litigation. January 28, 1983 Memorandum and Order (Reconsideration Q/A) at 7-8.

The record on this issue indicates that there has been discovery on the distributed igniter system, to which no party has objected. It is clear that the adequacy of this system has never been demonstrated, as required by the Commission's new hydrogen rule. See OCRE's Updated Responses to Applicants' Second Set of Interrogatories to OCRE, dated January 22, 1985.

Evidence exists that no one has ever considered Issue #8 to be limited to recombiners. Exhibit 1 (more fully explained in OCRE's January 22, 1985 Motion to Reword Issue #8) demonstrates that NRC management considers Issue #8 as encompassing "containment hydrogen control measures." Exhibit 2 is a handout presented by the Hydrogen Control Owners Group, of which

Applicant is a member, at the January 23, 1985 NRC-HCOG meeting.

Note that HCOG (and thus, Applicants) believe that degraded core hydrogen control is an issue for the Perry ASLB hearing. It should also be noted that the "issue" as defined by HCOG includes all facets of the distributed igniter system design and operation, including both containment integrity and equipment survivability.

Indeed, the Staff's new interpretation of Issue #8 is totally at odds with the Appeal Board's ALAB-675 decision and the new hydrogen rule. The Appeal Board declared, and both Applicants and Staff have accepted, that Issue #8 concerns a "TMI-2 type accident." 15 NRC at 1115. Compare the statement in the summary section of the Federal Register notice of the new hydrogen control rule:

The new requirements will result in greater assurance that nuclear power reactor containments and safety systems and components will continue to function properly so that reactors can be safely shut down following a Three Mile Island-type of accident.

Clearly, a contention concerned with a TMI-type accident is not challenging design-basis-accident hydrogen control. This is precisely why OCRE believes that the present wording of Issue #8 is incorrect. The Staff's sudden assertion that Issue #8 is limited to design basis hydrogen control measures is simply a blatant misrepresentation.

The Staff in fact admits that the present wording of Issue #8 is a true assertion; recombiners cannot accommodate large quantities of hydrogen. Staff's Motion at 5. However, the

standards for summary disposition require that the issue be decided in OCRE's favor. A reasonable mind having as its utmost concern the public welfare, as required by Zimmer, supra, would inquire about the adequacy of the distributed igniter system, if recombiners are inadequate. The adequacy of this system has never been demonstrated. No Staff SER on the Perry igniter system has ever been issued. There is no assurance that this system meets the Commission's new rule.

An examination of the entire record on Issue #8 demonstrates that Issue #8 encompasses more than recombiner adequacy. A genuine issue of material fact on the adequacy of the Perry hydrogen control system for degraded core accidents thus exists.

III. THE STAFF'S MOTION IS UNTIMELY

As is essentially admitted in the Stefano affidavit, the Staff's argument on the scope of Issue #8 could have been raised as early as May 1982. However, neither Staff nor Applicants have ever claimed that Issue #8 is limited to recombiners until now. Both Staff and Applicants answered numerous interrogatories on the distributed igniter system without objection. No explanation has been given on why the Staff has waited 2-1/2 years before raising this argument.

It is the practice in NRC proceedings that parties must raise contentions, arguments, objections, and other claims at the earliest opportunity or they are waived absent good cause for untimeliness. The Staff's own motion clearly demonstrates that good cause for waiting this long is entirely lacking. What

probably happened is that the Staff, having lost its primary objection to the litigation of the issue, that a credible accident scenario must be specified, with the issuance of the new rule, has in desperation fabricated a claim which it never thought of before. The Staff's untimely motion must be denied.

IV. CONCLUSION

The NRC Staff's motion for summary disposition of Issue #8 is fatally flawed. It is based on the incorrect wording of the issue and grossly distorts the entire record, which must be considered in deciding summary disposition motions. It fails to demonstrate the absence of a genuine issue of material fact or that the public health and safety will be satisfactorily protected. In addition, it is inexcusably late, raising a claim that should have been made 2-1/2 years ago.

The Staff's motion must be denied.

Respectfully submitted,



Susan L. Hiatt
OCRE Representative
8275 Munson Rd.
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(216) 255-3158

STATEMENT OF MATERIAL FACTS AS TO WHICH A GENUINE ISSUE EXISTS

1. Staff's motion for summary disposition of Issue #8 is predicated on the assumption that Issue #8 is limited to recombiner adequacy.

2. The history of Issue #8, as set forth in the attached affidavit, clearly shows that Issue #8 encompasses the adequacy of all hydrogen control measures at Perry, including the distributed igniter system, in that:

(a) discovery has been conducted on the distributed igniter system by both OCRE and Applicants, without objection from any party;

(b) ALAB-675 interpreted Issue #8 to be predicated on the assumption of a TMI-2 or degraded core accident (the same accident the new hydrogen rule provides protection against), for which recombiners are known to be insufficient and for which the distributed igniter system was designed.

3. It is not yet certain how Applicants' distributed igniter system will be operated (nor are the details of its design certain) and it is unclear how components of the design basis combustible gas control system will be used in a degraded core accident.

4. The adequacy of Applicants' degraded core accident hydrogen control system has never been demonstrated.

5. No Staff SER has ever been issued on the adequacy of Applicants' degraded core accident hydrogen control system.

AFFIDAVIT OF SUSAN L. HIATT

I, Susan L. Hiatt, duly sworn depose and say that:

1. Since March 1982 I have served as the legal representative, pursuant to 10 CFR 2.713(b), of intervenor Ohio Citizens For Responsible Energy. From June 1981 to March 1982 I was involved in the technical research aspects of this proceeding. I have been responsible for virtually all activity, including pleadings, research, and discovery, on Issue #8 since the contention's admission.

The purpose of this affidavit is to delineate the history and scope of Issue #8 from its admission to the present time.

The information in this affidavit is true and correct to the best of my knowledge and belief.

2. In its March 3, 1982 Memorandum and Order the Licensing Board admitted Issue #8, which the Board worded as follows:

Applicant has not demonstrated that the manual operation of two recombiners in each of the Perry units is adequate to assure that large amounts of hydrogen can be safely accommodated without a rupture of the containment and a release of substantial quantities of radioactivity into the environment.

This sentence is the Board's restatement of the intervenor's technical analysis of the adequacy of the only hydrogen control system then identified in Applicants' FSAR.

Reference to the FSAR was necessary to meet the Board's stated criteria for admission of contentions. See Special Prehearing Conference Memorandum and Order of July 28, 1981 at 15.

3. Recombiners are just one sub-system of the Applicants' hydrogen control system which was referenced in the FSAR. The

complete system consists of hydrogen analyzers, a "mixing" system consisting of purge compressors taking suction from the containment atmosphere and exhausting into the drywell, recombiners, and containment purge capability. FSAR 6.2.5. It was our intention to challenge the entire hydrogen control system, including any additions or changes thereto, and the ability of the Perry Mark III containment to withstand the effects of hydrogen combustion without loss of integrity.

4. The first notice I received that Applicants would be using a hydrogen control system other than that referenced in the FSAR was the Appeal Board's decision in ALAB-675, which denied Applicants' motion for directed certification of the Licensing Board's Order admitting Issue #8. See 15 NRC at 1116, where the Appeal Board states that "before proceeding further with [then] Sunflower's contention, the Licensing Board should determine applicants' present plans [the distributed igniter system] in this regard and the effect this will have on the contention here at issue."

5. I interpreted that sentence as a directive to the Licensing Board; i.e., the Board was required to take the initiative in resolving the matter. As months passed, it became apparent that the Licensing Board did not share that view. So that discovery would not be marred by objections to interrogatories concerning igniters (since the issue's wording mentioned only recombiners), I raised the matter of rewording the issue during the August 13, 1982 conference call. Tr. 743-4.

The Board chairman responded to this by ordering that Issue #8 was to be interpreted in light of ALAB-675. Although no actual rewording of the issue resulted, I believe that the Board intended by that "order" that Issue #8 was not to be interpreted as only encompassing those facets specifically mentioned in its wording. In any event, Applicants did not object to that "order." Tr. 745. Nor did the Staff voice any objection.

5. During discovery, numerous interrogatories were propounded to all concerned parties that addressed Applicants' glow plug igniter system. See, e.g., OCRE's interrogatories 5-10 through 5-18, 5-22, 5-29, 5-47, and 5-67 of OCRE's 5th Set of Interrogatories to Applicants and OCRE's interrogatories 6-16, 6-17, 6-18, and 6-24 of OCRE's 6th Set to Staff. Neither Applicants nor Staff objected to these interrogatories on the ground that Issue #8 is limited to recombiners, although both parties have been quick to object to other interrogatories on other issues on this ground.

In fact, Applicants' Interrogatory #10 of their Second Set to OCRE specifically requested information "with regard to the use of igniters as a hydrogen control system (including containment strength and equipment survivability)". Applicants also asked whether OCRE believes that inerting will safely control hydrogen. In fact, Applicants did not propound any interrogatories on recombiners. OCRE did not object to Applicants' interrogatories on either igniters or inerting, and has recently updated its response to interrogatory #10 providing

a detailed discussion of the inadequacy of Applicants' igniter system.

More recently, OCRE's 13th Set of interrogatories to Applicants sought information relating to Applicants' distributed igniter system. Applicants did not object to any of these interrogatories on the ground that Issue #8 only pertains to recombiners.

Applicants' voluntary answers to these interrogatories encompassed details of analyses on containment strength, of their deflagration containment response computer code, and of the experiments conducted for the Hydrogen Control Owners Group regarding Mark III unique combustion phenomena, the thermal environments resulting therefrom, and the effects of this environment on equipment survivability.

6. During the November 15, 1982 conference call, the Board tried to determine what hydrogen control system would be used at Perry, Tr. 769. There was then some discussion of whether Applicants' hydrogen control system could control the amount of hydrogen released from an 80% metal-water reaction. Although no definite answers were given to the Board's inquiries, no one raised the objection that Issue #8 only concerned recombiners.

7. Believing that the Board's actions during the conference calls did not fulfil the requirement of ALAB-675, and fearing that the incorrect wording of Issue #8 would create the opportunity for Applicant and Staff mischief, I formally sought the rewording of Issue #8 in February 1983. The Board deferred

action on this motion until issuance of the final hydrogen control rule. March 31, 1983 Memorandum and Order. Since the new rule has now issued, I recently renewed our effort to reword the issue.

8. The Appeal Board in ALAB-675 stated that Issue #8 is predicated on the assumption of a TMI-2 type accident. 15 NRC at 1115. While the Appeal Board did not define such an accident, it is clear that it concerns a degraded core accident. The new hydrogen rule specifically addresses those hydrogen control measures needed to cope with the quantities of hydrogen generated in such an accident, from a 75% metal-water reaction. The Licensing Board has always tied Issue #8 to the issuance of the new hydrogen control rule. See March 3, 1982 Memorandum and Order at 8 (*we believe it to be more prudent to proceed on the assumption that by the commencement of operation of Perry, the requirements of 10 CFR 50.44 will be more stringent*), and Orders of March 3 and 31, 1983, in which the Board deferred further work on Issue #8 until the hydrogen rule issued. While it has been recognized by all parties that recombiners are not able to control such large amounts of hydrogen, the abilities of the distributed igniter system are less certain. Applicants have certainly not met their burden of demonstrating compliance with the new regulation. In fact, there is very little in the way of formal submittals on this matter on the Perry docket. No Staff SER has been issued on the Perry igniter system.

It is not even clear whether portions of the design-basis hydrogen control system will be used for degraded core accident hydrogen control. Containment response analyses assume the operation of the drywell purge compressors. It is not clear whether the hydrogen analyzers or containment purge/vent capabilities will be utilized. It does seem clear that igniters will be substituted for recombiners as the hydrogen removal mechanism, but at what point in the accident this will occur is uncertain. Applicants have not submitted operators' instructions or procedures for the use of these systems. However, Subtask 9.1 of Applicants' program plan for hydrogen control (submitted with the July 19, 1984 letter referenced by Staff) states that the emergency procedure guideline under development will address both design basis and degraded core accident quantities of hydrogen.

9. In conclusion, the record of Issue #8 in this proceeding clearly demonstrates that Issue #8 challenges all hydrogen control systems at Perry, including the distributed igniter system, that no party has ever considered Issue #8 to be limited to recombiner adequacy, that discovery has been conducted on hydrogen control systems other than recombiners (even one that Applicants have not proposed for Perry, inerting), that OCRE's interpretation of Issue #8 is consistent with all previous rulings of the Licensing Board, with ALAB-675, and with the Commission's new hydrogen control rule, and that the adequacy of the distributed igniter system has not

been determined.

Susan L. Hiatt

Susan L. Hiatt

Sworn to and subscribed before me this 5th day of February
1985.

Marley Ford Eiger

Notary Public

MARLEY FORD EIGER, Attorney At Law
Notary Public - State of Ohio

My commission has no expiration date.

Section 147.03 R. C.

Recorded in Lake County, Ohio



EXHIBIT 1

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CONTESTED ISSUES ADMITTED IN EACH PUBLIC HEARING

| <u>Name of Plant and Licensee</u> | <u>Admitted Contentions</u> |
|---|--|
| <u>Cleveland Electric Illuminating Co.</u> <u>(Perry Nuclear Power Plant,</u> <u>Units 1 & 2)</u> | <ol style="list-style-type: none">1. adequacy of Applicant's onsite emergency plan.2. adequacy of quality assurance program in view of construction quality of work done by the electrical contractor.3. adequacy of limited tests to demonstrate that the emergency core cooling system meets the requirements of the regulations.4. adequacy of design and procedures to cope with a pipe break in the scram discharge volume.5. need for automated standby liquid control system to mitigate an anticipated transient without scram.6. adequacy of measures to prevent fouling of cooling water intake by Asiatic clams.7. adequacy of containment hydrogen control measures.8. adequacy of the environmental qualification of certain safety-related equipment and components with regard to degradation of polymers from radiation.9. adequacy of the environmental impact statement with regard to the weight given to increased employment and tax revenues as a benefit of operation.10. adequacy of environmental impact statement regard to assessment of economic effects of a serious accident.11. adequacy of protection afforded safety-related equipment against turbine missiles.12. reliability of Trans-American Delaval diesel generators installed at Perry.13. adequacy of measures to prevent steam erosion of components. |

INTRODUCTION

- o HCOG approach to resolve hydrogen issue
 - Program Plan
 - Acceptance Criteria

- o Agree upon schedule with NRC on program plan and acceptance criteria

- o Importance
 - MP&L currently required by license condition to resolve hydrogen control issue by end of first refueling outage
 - CEI fuel load scheduled for June 1985
 - Issue for ASLB hearing
 - GSU fuel load scheduled for April 1985
 - Single issue open requiring second ACRS subcommittee meeting
 - IPC fuel load scheduled for January 1986

- o Executive participation

GOALS FOR 1/23/85 MEETING
BETWEEN HCOG AND NRC MANAGEMENT

- o Discuss HCOG Approach to Resolving Hydrogen Control Issue
- o Review Licensing Schedule Constraints on Issue Resolution
- o Discuss Philosophy of Program Plan and Acceptance Criteria
- o Summarize Contents of Program Plan
- o Review Status of Program Plan Activities
- o Identify Known Key Open Issues
- o Agree Upon Schedule for Achieving Agreement With NRC on program plan and acceptance criteria

HCOG/MARK III Hydrogen Control Background

- o HCOG formed and met with the NRC in mid 1981 to discuss goals
- o Emphasis of early HCOG generic efforts on demonstrating containment pressure integrity
 - Developed Containment Response Code (CLASIX-3) and completed sensitivity analysis for hydrogen deflagrations
- o HCOG met with the NRC in September 1982 to discuss the planned testing program to resolve remaining open issues
 - To resolve questions on combustion phenomena above the suppression pool, HCOG conducted visualization tests in a 1/20 scale facility
- o HCOG met with NRC management in July 1983 to discuss test results and propose additional testing and analysis to resolve the issue
 - Agreed on mechanistic approach to define hydrogen releases
 - Agreed some scenarios considered by HCOG must result in hydrogen production equivalent to 75% MWR
 - HCOG committed to 1/4 scale test
 - HCOG committed to complete hydrogen generation study
- o Met with the NRC Staff several times since then to discuss the 1/4 scale test program, hydrogen generation study and other issues raised by the NRC
- o HCOG submitted a Comprehensive Program Plan and Acceptance Criteria in December 1984

HCOG PROGRAMMATIC GOALS

- o Respond to hydrogen control rule requirements (10 CFR 50.44)
- o Assure containment structural integrity is maintained
- o Assure equipment required to survive hydrogen combustion remains functional
- o Achieve these goals within the context of:
 - recoverable degraded core accidents
 - using mechanistic approach to define hydrogen release
 - considering Mark III unique combustion phenomena
 - considering effects of plant unique features
- o Complete program consistent with Mark III licensing schedules and in cost effective manner

PURPOSE OF HCOG PROGRAM PLAN AND ACCEPTANCE CRITERIA

Program Plan

- o Provide management tool to achieve resolution
- o Concisely define the tasks required to resolve the degraded core hydrogen control issue
- o Identify interactions with the NRC in order to review HCOG work
- o Show relationship between tasks in the program
- o Provide basis for establishing integrated program schedule

Acceptance Criteria

- o Define limits on the overall program for responding to hydrogen control requirements
- o Provide a definitive basis for evaluating completed work
- o Focus review on significant issues

PHILOSOPHY OF ACCEPTANCE CRITERIA

- o Recoverable degraded core accidents are significantly less probable than ^{but} design basis events
 - Realistic assumptions are appropriate
 - Additional conservatisms need not be imposed on assumptions and analytical or test results
 - Some uncertainty in results is acceptable

- o HCOG proposed acceptance criteria
 - Establish reasonable levels of conservatism
 - Specify constraints on assumptions and results
 - Assure that results are limited to recoverable degraded core accidents

WORK COMPLETED
TO DATE BY HCOG

- o Preparation of comprehensive program plans
- o Development of a containment response analysis code to evaluate the effects of deflagrations in Mark III containment (CLASIX-3)
- o Completion of extensive containment response sensitivity studies using CLASIX-3
- o Preparation of a topical report documenting and verifying CLASIX-3
- o Completion of a study to define the most probable hydrogen generation event (General Electric)
- o Research on combustion of hydrogen in hydrogen rich, steam rich environment
- o Research on nature of combustion in Mark III containment in small scale test facility (1/20th scale)
- o Initiation of 1/4 scale test program
- o Modification of EPRI BWR Core Heatup Code
- o Calculation of hydrogen production with EPRI BWR Core Heatup Code

PROGRAM PLAN
TASK SUMMARY

Task 1 Establish Most Probable Hydrogen Generation Event

- Specify quantity of hydrogen to be considered
- Establish approach to define scenario
- Develop combination of probabilistic and deterministic scenario

Task 2 Select Mitigation Scheme

- Establish criteria for evaluating alternate systems
- Evaluate concepts
- Select system
- Document Selection

Task 3 Design Hydrogen Ignition System

- Select common igniter
- Specify design requirements
- Establish control requirements

Task 4 Containment Ultimate Capacity Analysis

- Define containment structure ultimate capacity
- Evaluate capacity of local components
- Investigate negative pressure effects
- Determine if local detonations can occur

PROGRAM PLAN
TASK SUMMARY (CONT)

- Task 5 Selection of Containment Response Analysis Code
- Review available codes
 - Select code
 - Modify code
 - Complete verification
 - Document verification
- Task 6 Hydrogen Combustion Testing
- Monitor industry hydrogen testing
 - Investigate Mark III unique combustion phenomena
 - Complete flammability limit tests in hydrogen rich atmospheres
- Task 7 Generation of Hydrogen Release Histories
- Develop preliminary hydrogen release histories based on MARCH results
 - Calculate hydrogen release histories with BWR Core Heatup Code
 - Complete BWR Core Heatup Code sensitivity study
 - Select hydrogen release histories for input into 1/4 scale test program
- Task 8 Containment Response Analysis
- Define generic Mark III deflagration analysis base case
 - Complete generic deflagration analysis sensitivity study
 - Determine if plant specific deflagration analyses are required
 - Define deflagration thermal environment for equipment survivability evaluation

PROGRAM PLAN
TASK SUMMARY (CONT)

Task 9 Diffusion Flame Thermal Environment

- Design 1/4 scale test facility
- Prepare 1/4 scale test matrix
- Complete testing
- Prepare final test report

Task 10 Evaluation of Drywell Response to Degraded Core Accidents

- Define drywell break accident sequences
- Calculate drywell break blowdown
- Analyze drywell response using CLASIX-3
- Determine if inverted diffusion flames can occur
- Specify drywell thermal environment for equipment survivability
- Determine if pool swell loadings might exceed design basis *inverted?*

Task 11 Equipment Survivability Analysis Program

- Prepare equipment survivability list
- Model equipment
- Define thermal profiles for survivability analysis
- Calculate thermal response of components
- Document equipment survivability

Task 12 Validation of Analytical Methods

- Develop CLASIX-3 model of 1/4 scale test facility
- Predict 1/4 scale deflagration test
- Include complex calorimeter in test facility
- Calculate response of calorimeter
- Compare calculated response to measured response
- Document methods validation

PROGRAM PLAN
TASK SUMMARY (CONT)

Task 13 Combustible Gas Control EPG

- Draft EPG
- Calculate action limits
- Define spray timing
- Review EPG directions against licensing assumptions
- Document EPG directions vs. licensing assumption review

Task 14 Nevada Test Site Data Evaluation

- Investigate NTS data
- Identify equipment features applicable to Mark III
- Compare licensing assumptions to NTS results
- Document NTS evaluation results

STATUS OF HYDROGEN CONTROL PROGRAM

- o All Program Major Tasks in progress
- o Generic work in Tasks 1 - 6 essentially complete
- o Task 7, Generation of Hydrogen Release Histories
 - Initial hydrogen release histories presented to NRC
 - BWR Core Heatup Code sensitivity study completed
 - Proposed scenario presented to NRC
 - Key open issues between HCOG and NRC identified
- o Task 8, Containment Response Analysis
 - Generic containment response analysis completed
 - Generic sensitivity study completed
 - NRC RAI responses to be submitted in February
 - An additional generic deflagration analysis planned in response to RAI
- o Task 9, Diffusion Flame Thermal Environment
 - Test facility construction complete
 - Shakedown testing in progress
 - Test matrix submitted
- o Task 10, Evaluation of Drywell Response to Degraded Core Accidents
 - Accidents to be considered have been established
 - Blowdown models under evaluation.
 - Criteria for existence of inverted diffusion flames under development

STATUS OF HYDROGEN CONTROL
PROGRAM (CONT)

- o Task 11, Equipment Survivability Analysis Program
 - Criteria for developing lists defined
 - Generic modeling work initiated

- o Task 12, Validation of Analytical Methods
 - Complex calorimeter designed, fabricated and installed in facility
 - 1/4 scale CLASIX-3 model being developed

- o Task 13, Combustible Gas Control EPG
 - EPG drafted
 - Initial action limits drafted

- o Task 14, Nevada Test Site Data Evaluation
 - Applicable data obtained from EPRI
 - Data review in progress

OPEN ISSUES

- o Define hydrogen release histories which can be produced by recoverable accidents
 - Definition of recoverable accidents
 - Accident sequences which should be considered
 - Resolve questions on BWR Core Heatup Code

- o Definition of diffusion flame thermal environment
 - Resolution of questions on 1/4 scale facility design
 - Finalize 1/4 scale test matrix

- o Demonstrate equipment survivability
 - Acceptability of methodology validation
 - NTS data evaluation

- o Definition of drywell thermal environment
 - Resolution of questions on deflagration analysis
 - Assessment of possible inverted diffusion flames

- o Development of combustible gas control emergency procedures guideline

STATUS OF 1/4 SCALE
TEST FACILITY

- o Vessel construction complete
- o Instrumentation installation complete
- o Peripheral support system (i.e. boiler, hydrogen supply, etc.) installation complete
- o Data acquisition system installation complete
- o Instrumentation/system checkout and testing in progress
- o Plan to complete initial shakedown testing involving hydrogen by mid-February
- o Plan to initiate Scoping Tests by late February

Two weeks prior to scoping test initiation

- o Must have agreement on hydrogen release histories which will be injected into facility
- o Must have agreement on adequacy of facility and test matrix

OVERALL SCHEDULE
FOR AGREEMENT ON PROGRAM PLAN
AND ACCEPTANCE CRITERIA

The following schedules for NRC approval of program plan and acceptance criteria are based upon HCOG's current completion schedule for work identified in the program plan.

- o NRC acceptance of following requested by 2/4
 - Generation of Hydrogen Release Histories
 - Diffusion Flame Thermal Environment

- o NRC acceptance of following requested by 2/28
 - Equipment Survivability Analysis Program
 - Nevada Test Site Data Evaluation
 - Containment Response Analysis
 - Evaluation of Drywell Response to Degraded Core Accidents

- o Issue complete Safety Evaluation Report by 3/15

CERTIFICATE OF SERVICE

This is to certify that copies of the foregoing were served by deposit in the U.S. Mail, first class, postage prepaid, this 3rd day of February, 1985 to those on the FEB 11 service list below. A10:35

* - served Feb. 6, 1985

Susan L. Hiatt

Susan L. Hiatt

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