



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

AUG 20 1984

Docket Nos.: 50-440  
and 50-441

MEMORANDUM FOR: B. J. Youngblood, Chief, Licensing Branch No. 1, DL

FROM: John J. Stefano, Project Manager, Licensing Branch  
No. 1, DL

SUBJECT: SUMMARY REPORT OF MEETING WITH THE CLEVELAND ELECTRIC  
ILLUMINATING COMPANY (CEI) RE PERRY PLANT-SPECIFIC  
RESPONSES TO THE HYDROGEN CONTROL SER LICENSE  
CONDITION (5)

The meeting was held in Bethesda, Maryland on June 19, 1984, at the request of CEI, during which CEI briefed the NRC staff of its plans to address the hydrogen control issue specifically for Perry. This issue is identified as License Condition (5) in Section 1.11 of the Perry SER (NUREG-0887). The meeting was noticed in the PDR and the Perry docket by my memorandum to you dated June 11, 1984.

At the request of the Government Accountability Project (GAP), submitted by letter to H. R. DenCon dated June 18, 1984, both the NRC and GAP tape recorded the meeting discussions. Due to the poor quality of the NRC tape, a fully complete transcript was not possible to reproduce. This report was delayed attempting to reproduce the transcript of the NRC tape without positive results. Therefore it was decided to issue this report, albeit late, in summary form. The Perry intervenor (OCRE) has been given a copy of the NRC tape. Enclosure (1) is a list of those who participated in the meeting. Enclosure (2) is a copy of the slide presentation made by CEI, copies of which were distributed to the meeting participants.

In summary, CEI briefed the NRC staff of its program plans for resolving the degraded core hydrogen control issue in order to support a full power operating license for Perry. Formal submittal of the program plan was subsequently submitted to the NRC by CEI letter dated July 19, 1984. The submittal includes a comprehension program updating earlier information submitted in response to FSAR Question 480.40, which was also discussed at this meeting. CEI indicated at the meeting that, due to the complete nature of the hydrogen control licensing issue, a significant amount of analysis, testing and design activities, requiring several diverse fields of expertise, will be required to assure an adequate resolution. A significant amount of work has been completed to date by CEI and the Hydrogen Control Owners Group (HCOG) to resolve the issue for Mark III containment design. CEI has and intends to remain an active member of the HCOG.

8408290396 840820  
PDR ADOCK 05000440  
E PDR

AUG 20 1984

-2-

The Program Plan submitted on July 19, 1984 provides a management guide to the program activities, completed, ongoing and planned to resolve the hydrogen control issue. It is aimed at addressing the significant issues raised by the NRC staff during its review of the Grand Gulf Nuclear Station hydrogen ignition system and the HCOG activities. The Perry hydrogen ignition system design is similar to that installed in Grand Gulf. The NRC staff has been given a copy of the Program Plan for review and comment.

LSI  
John J. Stefano, Project Manager  
Licensing Branch No. 1  
Division of Licensing

Enclosures:  
As stated

cc: T. M. Novak

CONCURRENCES:

DL#LB#1

JStefano:es

8/1/84

DL#LB#1

BJYoungblood

8/1/84

DIST:

Docket File

NRC PDR

Local PDR

PRC System

NSIC

LB#1 Rdg

MRushbrook

JStefano

OELD, Attorney

ACRS 16


EJordan

NGrace

AUG 20 1984

-2-

The Program Plan submitted on July 19, 1984 provides a management guide to the program activities, completed, ongoing and planned to resolve the hydrogen control issue. It is aimed at addressing the significant issues raised by the NRC staff during its review of the Grand Gulf Nuclear Station hydrogen ignition system and the HCOG activities. The Perry hydrogen ignition system design is similar to that installed in Grand Gulf. The NRC staff has been given a copy of the Program Plan for review and comment.

  
John J. Stefano, Project Manager  
Licensing Branch No. 1  
Division of Licensing

Enclosures:  
As stated

cc: T. M. Novak

PERRY

Mr. Murray R. Edelman  
Vice President, Nuclear Group  
The Cleveland Electric Illuminating Company  
P. O. Box 5000  
Cleveland, Ohio 44101

cc: Jay Silberg, Esq.  
Shaw, Pittman, Potts & Trowbridge  
1800 M Street, N. W.  
Washington, D. C. 20006

Donald H. Hauser, Esq.  
The Cleveland Electric Illuminating Company  
P. O. Box 5000  
Cleveland, Ohio 44101

Resident Inspector's Office  
U. S. Nuclear Regulatory Commission  
Parmly at Center Road  
Perry, Ohio 44081

U. S. Nuclear Regulatory Commission  
Mr. James G. Keppler, Regional  
Administrator, Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Donald T. Ezzone, Esq.  
Assistant Prosecuting Attorney  
105 Main Street  
Lake County Administration Center  
Painesville, Ohio 44077

Ms. Sue Hiatt  
OCRE Interim Representative  
8275 Munson  
Mentor, Ohio 44060

Terry J. Lodge, Esq.  
618 N. Michigan Street  
Suite 105  
Toledo, Ohio 43624

John G. Cardinal, Esq.  
Prosecuting Attorney  
Ashtabula County Courthouse  
Jefferson, Ohio 44047

ENCLOSURE 1

CEI/NRC HYDROGEN CONTROL

MEETING

JUNE 19, 1984

LIST OF ATTENDEES

CEI

Larry Bedo  
Eileen Buzzelli  
Gerry Presby

CEI Consultant/TERA

John Richardson

NRC

Jack Kudrick, CSB/DSI  
Allan Notafrancisco, CSB/DSI  
Charles Tinkler, CSB/DSI  
\*\*Kris Parczewski, CHEB/DE  
Colleen Woodhead, ELD  
\*Bryon Siegel, Clinton Project Manager  
John Stefano, Perry Project Manager  
\*Paul Bochnert, ACRS  
M. Rushbrook, Licensing Assistant

Illinois Power Company (Clinton)

\*Steve Green  
\*Kathy Ann Baker

Government Accountability Project (GAP)

Donald L. Schlemmer

\*Interested party observers  
\*\*Part time

PNPP H<sub>2</sub> CONTROL  
NRC MEETING  
JUNE 19, 1984

- o INTRODUCTION
- o PNPP H<sub>2</sub> CONTROL PROGRAM OVERVIEW
- o PNPP H<sub>2</sub> CONTROL LICENSING APPROACH
- o NRC FSAR QUESTIONS
  - PROPOSED RESPONSE/APPROACH
- o HCOG ACTIVITIES SUPPORTING PNPP H<sub>2</sub> CONTROL PROGRAM
  - CEI PARTICIPATION AND APPLICABILITY OF ACTIVITIES
  - NRC REQUESTS FOR ADDITIONAL INFORMATION
- o PREVIOUS NRC H<sub>2</sub> CONTROL ISSUES APPLICABLE TO PNPP
  - GGNS SER CONCLUSIONS/ISSUES
- o PERRY H<sub>2</sub> CONTROL PROGRAM SCHEDULE
- o NRC COMMENTS
- o SUMMARY

PNPP H<sub>2</sub> CONTROL  
PROGRAM PLAN

- o SELECTION OF HYDROGEN CONTROL SYSTEM
  - REVIEW OF STUDIES ON CANDIDATE SYSTEM
  - SELECTION OF HYDROGEN IGNITION SYSTEM (HIS)
  
- o DESIGN OF HIS
  - ESTABLISH DESIGN CRITERIA
  - DESIGN HIS AND QUALIFY IGNITER
  - DEVELOP TECHNICAL SPECIFICATIONS
  - PERFORM PREOPERATIONAL TESTS
  
- o CONTAINMENT ULTIMATE CAPACITY ANALYSIS
  - PERFORM CONTAINMENT ULTIMATE CAPACITY ANALYSIS
  - EVALUATE POTENTIAL FOR NEGATIVE PRESSURE, AND LOCAL DETONATIONS
  
- o CONTAINMENT RESPONSE ANALYSIS
  - SELECT CONTAINMENT RESPONSE CODE TO ANALYZE HYDROGEN DEFLAGRATION
  - PERFORM CONTAINMENT RESPONSE ANALYSIS
  
- o DEVELOP MECHANISTIC SCENARIOS AND HYDROGEN RELEASE RATES
  - SELECT A DEGRADED CORE MODEL
  - DEFINE INPUT PARAMETERS, CRITERIA AND LIMITS, AND ACCIDENT SEQUENCES
  - GENERATE H<sub>2</sub> RELEASE HISTORIES

PNPP H<sub>2</sub> CONTROL  
PROGRAM PLAN (CONT.)

- o EQUIPMENT SURVIVABILITY ANALYSIS
  - IDENTIFY SAFETY EQUIPMENT REQUIRED FOR HGE
  - DEFINE BASE CASE TEMPERATURE AND PRESSURES (CLASIX-3 AND 1/4 SCALE)
  - SELECT A HEAT TRANSFER CODE AND DEMONSTRATE EQUIPMENT RESPONSE WITHIN ACCEPTABLE LIMITS
  
- o HYDROGEN COMBUSTION TESTING
  - DEFINE 1/4 SCALE TEST OBJECTIVES AND DEVELOP TEST MATRIX
  - CONDUCT 1/4 SCALE TEST
  - DEVELOP FULL SCALE THERMAL PROFILES
  
- o RESOLVE NRC LICENSING ISSUES
  - REVIEW PREVIOUS ISSUES FOR PNPP APPLICABILITY
  - IDENTIFY GGNS SER OPEN ISSUES OR CONCLUSIONS APPLICABLE TO PNPP
  - PARTICIPATE IN HCOG RESOLUTION OF GENERIC ISSUES
  - SUBMIT NECESSARY DOCUMENTATION FOR NRC APPROVAL
  
- o DEVELOP EMERGENCY PROCEDURES FOR COMBUSTIBLE GAS
  - HCOG SUPPORT OF BWROG-EPC TO FINALIZE A GUIDELINE
  - DEVELOP PNPP SPECIFIC PROCEDURES
  - CONDUCT OPERATOR TRAINING



PNPP H<sub>2</sub> CONTROL PROGRAM  
LICENSING APPROACH

- o RESPONSE TO NRC FSAR QUESTIONS
  - DESIGN DESCRIPTION
  - CONTAINMENT ULTIMATE CAPACITY ANALYSIS
  - CONTAINMENT RESPONSE ANALYSIS
  - EMERGENCY PROCEDURE GUIDELINES
  
- o REVIEW PREVIOUS GGNS RAIS/ISSUES FOR APPLICABILITY TO PNPP
  - IDENTIFY ANY OUTSTANDING ISSUES APPLICABLE TO PNPP AND INCORPORATE INTO PNPP H<sub>2</sub> CONTROL PROGRAM
  
- o REVIEW GGNS SER AND SUPPLEMENTS FOR APPLICABILITY OF CONCLUSIONS/ISSUES TO PNPP
  - INCORPORATE OPEN ISSUES INTO PNPP H<sub>2</sub> CONTROL PROGRAM
  - SUBMIT A REPORT WITH APPROPRIATE JUSTIFICATION ON THE APPLICABILITY TO PNPP OF THE TECHNICAL BASIS AND CONCLUSIONS FOR GGNS INTERIM HIS APPROVAL
  
- o REVIEW PREVIOUS HCOG RAIS/ISSUES FOR APPLICABILITY TO PNPP
  - ENDORSE APPLICABLE RESPONSES WITH APPROPRIATE JUSTIFICATION
  - SUBMIT PNPP SPECIFIC RESPONSES AS NECESSARY
  
- o FINAL EQUIPMENT SURVIVABILITY ANALYSIS BASED UPON 1/4 SCALE TEST RESULTS

PNPP H<sub>2</sub> CONTROL PROGRAM  
GGNS SER APPLICABILITY TO PNPP

- o HIS SYSTEM DESCRIPTION
  - PNPP DESIGN CRITERIA CONSISTENT WITH GGNS
  - SAME IGNITER ASSEMBLY
  - PNPP PRE-OP AND SURVEILLANCE TESTING BASES CONSISTENT WITH GGNS
  - PEI BASED UPON BWROG EPG WILL RESOLVE ISSUES ON OPERATOR ACTION FOR COMBUSTIBLE GAS CONTROL
  
- o TESTING OF THE HIS
  - PNPP OPERABILITY TESTING PROGRAM CONSISTENT WITH GGNS
  - PNPP EQUIPMENT QUALIFICATION ENVELOPES COMPARED AGAINST HIS QUALIFICATION
  - HYDROGEN COMBUSTION TESTING PERFORMED BY HCOG
  
- o CONTAINMENT STRUCTURAL CAPACITY
  - CONTAINMENT ULTIMATE CAPACITY ANALYSIS PERFORMED WITH COMPARABLE MARGINS AS GGNS
  - DRYWELL DESIGN VERY SIMILAR TO GGNS AND THEREFORE SAME LEVEL OF MARGIN ABOVE DESIGN
  
- o DEGRADED CORE ACCIDENTS AND HYDROGEN GENERATION
  - LIKE GGNS, PNPP EVALUATED TWO BASE CASE SCENARIOS (SBLOCA AND SORV)
  - CONSERVATIVE GGNS RELEASE HISTORIES USED FOR INITIAL PNPP ANALYSIS

PNPP H<sub>2</sub> CONTROL PROGRAM  
GGNS SER APPLICABILITY TO PNPP (CONT.)

- o CONTAINMENT ANALYSIS
  - PNPP USED CLASIX-3 FOR BASE CASE ANALYSIS
  - INPUT AND MODELING ASSUMPTIONS CONSISTENT WITH GGNS
  - CLASIX-3 SENSITIVITY STUDIES SUBMITTED BY HCOG
  - DYNAMIC POOL LOADS FOR BASE CASE HYDROGEN COMBUSTION BOUNDED BY DESIGN BASIS
  - DISTRIBUTED IGNITION SYSTEM PRECLUDES LOCAL DETONATION
  
- o EQUIPMENT SURVIVABILITY
  - HEAT TRANSFER CODES AND METHODOLOGY CONSISTENT WITH GGNS
  - REQUIRED EQUIPMENT SIMILAR TO GGNS
  - DEFINITION OF BASE CASE TEMPERATURES AND PRESSURES CONSISTENT WITH GGNS (CLASIX-3 AND 1/4 SCALE TEST RESULTS)

PNPP H<sub>2</sub> CONTROL PROGRAM  
HCOG ACTIVITIES

- o CEI ACTIVE MEMBER OF HCOG
- o HCOG ACTIVITIES AND GENERIC RESOLUTION OF ISSUES REQUIRE CEI ENDORSEMENT FOR PNPP APPLICABILITY
- o HCOG RESPONSE TO NRC RAIS
  - GENERALLY APPLICABLE TO PNPP AND CEI WILL ENDORSE WITH SOME MINOR CLARIFICATIONS
  - FIRST SET OF HCOG RAIS (HGN-011):
    - DEALT PRIMARILY WITH CONTAINMENT RESPONSE ANALYSIS (CLASIX-3 SENSITIVITY STUDIES) AND EMERGENCY PROCEDURES
    - CEI WILL ENDORSE HCOG RESPONSES EXCEPT QUESTION 10 DEALING WITH EMERGENCY PROCEDURE GUIDELINES
    - CEI WILL PROVIDE PNPP SPECIFIC RESPONSE FOR QUESTIONS 8, 9, and 10
  - SECOND SET OF HCOG RAIS (HGN-016):
    - DEALT PRIMARILY WITH 1/4 SCALE TEST OBJECTIVES AND TESTING METHODS
    - CEI WILL ENDORSE ALL HCOG RESPONSES INCLUDING PORTION OF CSB-11 WHICH IS APPLICABLE TO PNPP
  - HCOG RAIS APPLICABLE TO MP&L ONLY (AECM-84/0014) ARE EITHER NOT APPLICABLE TO PNPP OR WILL BE RESOLVED AS PART OF THE CEI PROGRAM PLAN BY SUBMITTAL OF THE PNPP EQUIPMENT SURVIVABILITY REPORT.
- o HCOG 1/4 SCALE TESTING
  - H<sub>2</sub> RELEASE HISTORIES
  - TEMPERATURE PROFILES FOR EQUIPMENT SURVIVABILITY ANALYSIS

# PNPP H<sub>2</sub> CONTROL LICENSING SCHEDULE

