COMMENTS NOTED

AGENDA FOR MAY 22ND

HOOG - NRC MEETING

9:00 - 9:45	INTRODUCTION
9:45 - 12:00	RESOLVE OPEN ITEMS ON TASKS 1 AND 7
12:00 - 1:00	LUNCH
1:00 - 2:00	RESOLVE OPEN ITEMS ON TASK 9
3:00 - 3:00	RESOLVE OPEN ITEMS ON TASK 12
3:00 - 3:30	SUMMARY OF MEETING AGREEMENTS

INTRODUCTION

- Define Goals For Meeting
- Review Programmatic Goals and Philosophy of Hydrogen Control Owners Group
- Review Recent NRC-HOOG Interactions on Program Plan Tasks
- Evaluate NRC-HOOG Interactions

Goals for May 22, 1985

HCOG-NRC MEETING

1. Gain clarification of several issues in April 2 NRC letter

2. Present HCOG's position on several issues addressed in April 2 letter

3. Achieve resolution of ALL open issues on Tasks 1, 7, 9 and 12

4. Achieve NRC-HCOG agreement on hydrogen release history to be used in 1/4-scale facility test program

HCOG PROGRAMMATIC GOALS

- Respond to hydrogen control rule requirements (10 CFR 50.44)

- Assure containment structural integrity is maintained

- Assure equipment required to survive hydrogen combustion remains functional

- 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

- Complete program consistent with Mark III licensing schedules and in cost effective manner

HOOG PROGRAM PHILOSOPHY

RECOVERABLE DEGRADED CORE ACCIDENTS ARE SIGNIFICANTLY LESS PROBABLE THAN 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 INEVITABLE AND ACCEPTABLE

INTERACTIONS WITH NRC FROM JANUARY, 1985 TO PRESENT

- o Discuss Program Plan Philosophy, January 23
- o Review Program Plan Tasks 1 and 7, January 23
- o Technical Meeting to Resolve Open Issues on Tasks 1 and 7, January 30
- o Review Program Plan Tasks 11 and 12, January 31
- o Review Program Plan Task 9, February 1
- o Review Program Plan Tasks 5, 8 and 10, February 6
- o Review Program Plan Tasks 2, 3, 4, 6, 13 & 14, February 12
- o Issued Revision 1 to Program Plan, February 14
- o Technical Meeting to Resolve Open Issues on Task 9 and Final Review of Task 9 Acceptance Criteria, February 20
- o Issued Revision 2 to Program Plan, February 28
- o Received NRC Evaluation of Tasks 1, 7, 9 and 12, April 2

Evaluation of NRC-HCOG Interactions

HCOG's Concerns:

- Positions documented in NRC's April 2 letter appear inconsistent with agreements reached in January and February NRC-HCOG meetings

- Some items identified in NRC's April 2 letter appear to be outside HCOG's programmatic goals

- Need clear acknowledgement that degraded core events which result in hydrogen generation are of very low probability, and merit different consideration than design basis events

- Uncertainties in results are acceptable. There is no need to include excessive conservatisms

HCOG Perceptions of
Major Agreements Obtained From Staff
in January and February

- Evaluation of realistic and limited number of hydrogen release histories
- Two base cases to consider for evaluating diffusion flames
- Most probable hydrogen generation event involves recovery of ECCS
- BWR Core Heatup Code is generally acceptable for evaluating hydrogen production in BWRs
- Recoverable accident for HCOG program is defined as having 30% zircaloy melt pending results of sensitivity study which examines a 50% zircaloy melt event
- SBO and ATWS shall be shown to be low probability HGEs
- The 75% MWR hydrogen release history is to be defined
- Use of 2400K, irreversible oxidation cutoff temperature is acceptable for low local oxidation fractions
- Approach for validation of CLASIX-3

Unresolved Issues

- Issues which HCOG understood were resolved in January and February

  - Oxidation cutoff temperature - need to vary temperature and evaluate reversible cutoff — HOUSTON AGREED TO HCOG OXIDATION CUTOFF TEMP.

  - Recoverable core definition - significant changes suggested in defining point of non-recoverability — RWH SAID THIS WAS IRRELEVANT.

  - 75% MWR History - significant changes suggested in methods to calculate the hydrogen release history causing a 75% MWR release history

  - 75% MWR History - need to include in 1/4 scale test program — RWH STRONGLY RECOMMENDED THIS ITEM.

- Issues which HCOG seeks clarification of status

  - Applicability of SBO and ATWS as HGE initiators — RWH REJECTED QUANTITATIVE (1×10^{-6}) CRITERION.

  - Effects of blockage

  - Steam release rate capabilities

  - Froude modeling of heat sinks

  - Characterization of spray carryover

Unresolved Issues (Cont)

- o New Issues
  - Event termination mechanism (HPCS versus LPCI)
  - Validation of HEATING-6 with calorimeter deflagration data
  - Effects of vertical blockage
- o Areas where further work needed to achieve closure
  - Use of BWRCHUC sensitivity studies
  - Cumulative scoping test effects
  - Pre-test definition of CLASIX-3 validation analysis combustion parameters
  - Scaling deflagration data

Resolve Open Items on Tasks 1 and 7

- Define HCOG Base Cases
- Address potential modification of base cases per results of sensitivity and parametric studies
- HCOG definition of "Recoverable" core
- Oxidation cutoff temperature limit
- Event termination mechanism (HPCS vs LPCI)
- Applicability of SBO and ATWS as HGE initiators
- Use of BWRCHUC to model 75% MWR release history

BASE CASE HYDROGEN RELEASE HISTORIES

DIFFUSION FLAMES

Base Case A*: 300 GPM reflood initiated at 2530 seconds after scram

- o No more than 30% active core zircaloy melt
- o Provides limiting diffusion flame thermal environment

Base Case B*: 5000 GPM reflood initiated at 3400 seconds after scram

- o No more than 30% active core zircaloy melt
- o Provides most probable hydrogen generation event due to termination via ECCS

Assumptions Common to Base Case A & B in BWRCHUC

- o Oxidation cutoff temperature fixed at 2400K
- o Initial vessel pressure - 2 ATM
- o Water level - 3/4 core uncovered
- o No initial zirc oxide layer
- o 8 radial unit cells
- o 10 axial nodes

Diffusion flame thermal environment for equipment survivability evaluations will be defined using 1/4 scale test results for these release histories

* As documented in HCOG to NRC letter, HGN-031, dated March 13, 1985.

BASE CASE HYDROGEN RELEASE HISTORIES (CONT)

DEFLAGRATIONS

75% MWR History*: 5000 GPM reflood initiated at 3400 seconds after scram

- Sustained constant average hydrogen release till total hydrogen production equals 75% MWR

- Average hydrogen production calculated based on balancing maximum heat removal from severely damaged core against oxidation energy, decay energy, and stored energy

Deflagration thermal environment for equipment survivability evaluations will be defined using 1/4 scale test data for 5000 GPM reflood and CLASIX-3 predictions for sustained hydrogen production.

* As documented in HCOG to NRC letter HGN-034 dated May 17, 1985

Modification of Base Cases per Sensitivity and Parametric Studies

- Consider conservatisms enveloped in BWROHUC
- Parameters evaluated in sensitivity studies
- Compare results of studies to acceptance criteria
- Commit to additional testing for parameters outside acceptance criteria

BWR Core Heatup Code
Conservatisms in Modeling of Zircaloy Oxidation/Hydrogen Production

1. Ideal, undeformed core geometry maintained throughout problem solution -- even if melting occurs:

   --No steam flow disturbances through fuel bundles due to ballooning or other deformations or from melting/slumping

   --No steam flow disturbances during or after quenched-caused breakup of embrittled core regions

2. High oxidation cutoff conditions assumed

   --Cutoff temperatures well above melt

   - Zircaloy ~ 230K > T_{MELT}
   - Stainless steel ~ 150K > T_{MELT}

   --Baker-Just correlation trend extrapolated to very high rates well above data cutoff

3. No accounting for retardation of oxidation due to presence of hydrogen

4. High fuel-cladding gap heat transfer assumed

   --Gap assumed filled with pure He (~100 x conductivity of Xe or Kr which eventually poisons gap gas)

   --Effect is to couple cladding temperature closely to fuel (which contains ~ 90% of thermal capacity of fuel rod)

   - During heatup, cladding cannot reach cutoff conditions as fast
   - During cooldown, cladding is held up from cooling as fast

   --Result: Cladding effectively spends more time in oxidizing realm and may even avoid reaching cutoff

BWR Core Heatup Code Conservatisms (CONT)

5. Irreversibly stopping zircaloy oxidation at 2400K

   --Postpones any recognition of zircaloy liquefaction or slumping effects until well above melting (~230K above melting)

   --Only locally stops oxidation in affected node(s)

   - o Nodes axially above and below still see unaffected steam flow and oxidize
   - o Actual slumping would tend to isolate entire fuel bundle (Both above and below slumped region) from further oxidation

6. Core heatup is started from mostly uncovered (Post-ADS) condition which prevents thick buildup of the retarding ZrO2 layers prior to reflood -- thereby making exposed surfaces more susceptible to accelerated oxidation

7. Accident considered to be at low pressure

   --Leads to faster boiloff (greater steaming rate to remove decay heat from covered portion of core)

   --Also results in less buildup of retarding oxide layer

8. Full detail of using 4 nodes for both channel walls and control blades not used for calculating hydrogen production

   --Less radial temperature gradient with single nodes

   --Outer core regions participate more completely in oxidation transient

Parameters Evaluated in BWRCHUC Sensitivity Studies

- Initial vessel pressure
- Initial core water level
- Timing of reflood
- Reflood flow rate
- Oxidation cutoff temperature
- Fuel cladding gap conductivity
- Timing for start of core heatup

Issues Addressed via Sensitivity Studies

- Decay heat rate
- Timing of vessel depressurization
- Definition of recoverable accident (via zirc melt fraction)

Sensitivity Study Acceptance Criteria

1) Integrate the more conservative value for a parameter into the base case

or

2) Identify for additional test, those parameters for which a Y% change in that parameter results in a 0.5 Y % increase in either the peak hydrogen production rate or total hydrogen produced.

Issue: Recoverable Core Definition

HCOG Position - event which results in melt of no more than 30% of active core zircaloy

History - Jan 30, '85: In HCOG-NRC meeting, HCOG agreed to perform a sensitivity study which examines hydrogen production from a 50% zircaloy melt event

- April 2, '85: NRC letter indicates core support plate failure to be used to define a non-recoverable core

- April 16, '85: HGN-032 indicated that for a 67% increase in the amount of zircaloy reaching melt temperature (i.e. 50% of active core zircaloy inventory melts), there was a 30% increase in total hydrogen produced

Comments - HCOG charter does not encompass extensive research to define point of non-recoverability nor definition of point of support plate failure

- For BWR6, core support plate failure is inappropriate definition of recoverability. BWR6 core support plate is not a load bearing member.

- Sensitivity study results meet acceptance criteria defined earlier

Issue: Oxidation Cutoff Temperature Limit

HCOG Position - Irreversible oxidation cutoff temperature of 2400K provides conservative treatment of phenomena

History - Jan 30, '85: In HCOG - NRC meeting, HCOG agreed to evaluate the fraction of zirconium oxide in cladding as a function of time. If the fraction was low, the 2400K value would be acceptable.

- April 2, '85: NRC letter indicates oxidation cutoff temperature should be evaluated parametrically and reversible oxidation cutoff should be considered.

- April 16, '85: HGN-032 confirmed that in virtually no nodes did the zirconium oxidation fraction exceed 0.67 (EG&G criteria), and therefore the assigned value of 2400K is conservative.

Comments - Test data supports position that an irreversible, fixed oxidation cutoff temperature of 2400K is conservative.

- HCOG evaluated sensitivity study results which indicated a sensitivity to increasing the oxidation cutoff temperature, and defined conservative value to use in analyses (2400K exceeds the melting point for zircaloy)

- A reversible oxidation cutoff temperature is not representative of physical phenomena

ISSUE: EVENT TERMINATION MECHANISM (HPCS VS LPCI)

HCOG POSITION - ANY HIGH FLOW INJECTION SOURCE MAY BE ASSUMED TO TERMINATE ACCIDENT WITHOUT SIGNIFICANTLY IMPACTING RESULTING HYDROGEN GENERATION HISTORY.

HISTORY - APRIL 2, '85: NRC LETTER INDICATES A DISCREPANCY EXISTS BETWEEN HCOG PROGRAM PLAN AND GE STUDY REGARDING MOST PROBABLE ECCS SYSTEM AVAILABLE FOR EVENT TERMINATION

COMMENTS - HCOG HAS HAD B.WROHUC RUNS COMPLETED WHICH INDICATE THAT AT HIGH REFLOOD RATES THERE IS MINIMAL DIFFERENCE IN HYDROGEN GENERATION BETWEEN COOLANT INJECTION AT TOP OF CORE (HPCS) AND INJECTION INTO CORE SHROUD (LPCI)

Issue: SBO and ATWS as HGE Initiators

HCOG Position: SBO and ATWS contribution is a small fraction to overall probability of recoverable HGEs. HCOG proposed to re-evaluate their contribution and demonstrate that they need not be considered as probable precursors to recoverable degraded core accidents.

History:

- Jan 30 '85: In HCOG-NRC meeting, HCOG discussed position and agreed to provide justification for excluding ATWS and SBO due to low probability.

- April 2, '85: Evaluation should include hydrogen threat to containment including estimates of rates, timing and amounts of hydrogen generated. Also, these potential precursors should be considered in the context of the full set of precursor events to be considered.

Comments:

- HCOG re-evaluation would eliminate events if they pose no threat to containment from hydrogen combustion. THIS STATEMENT ADDRESSES ATWS.

- Objective of re-evaluation and criteria is to eliminate potential precursors which are a small fraction of total recoverable HGE probability.

- Criteria of 1 x E-6 was selected as reasonable basis for considering only dominant sequences

SBO and ATWS as HGE Initiators

Comments (CONT)

- Detailed estimates of hydrogen release rate and timing is not required if SBO and ATWS elimination from consideration of recoverable HGEs

- Therefore, the HCOG task and criteria meet the intent of the position in the April 2 1985 NRC letter

Issue: 75% Release History via BWRCHUC

HCOG Position - Cannot generate a 75% MWR release history with a recoverable geometry with a mechanistic model (i.e., BWRCHUC)

History - Jan 30, '85: In HCOG-NRC meeting, HCOG agreed to develop a 75% release history using methodology which is as mechanistic as possible

- April 2, '85: NRC letter indicated BWRCHUC was to be used to model 75% MWR release history

- May 17, '85: HGN-034 provided HCOG's 75% MWR release history

Comments - Too much energy would be released in BWRCHUC model to allow recovery, in any configuration, subsequent to oxidizing the equivalent to 75% of the active core cladding.

- HCOG's 75% MWR release history represents initial diffusion event identified in Base Case B, followed by sustained release rate of 0.1 lbm/sec

Resolve Open Items on Task 9

- Cumulative Effects
  RWH FOUND HCOG POSITION ACCEPTABLE.
- Effects of Blockage
  RWH ACCEPTED WHAT THEY SAID IN GENERAL, VERTICAL BLOCKAGE POSITION NEEDS JUSTIFICATION.
- Steam Release Rate Capabilities
  STAFF POSITION UNCLEAR
- Characterization of Spray Carryover
  RWH FOUND HCOG POSITION / STAFF AGREEMENT ACCEPTABLE
  UNCLEAR
- Bulk Mixing Patterns (spray-induced turbulence)
- Froude Modeling of Heat Sinks
- Scaling of Deflagration Test Data
- 75% MWR Release History in Test Facility

Issue: Consideration of Cumulative Effects

HCOG Position - The chosen parameters which may impact the thermal environment will be evaluated individually and assessed for significance per acceptance criteria

History - Feb 1, '85: In HCOG-NRC meeting, it was agreed that scoping test results would be reviewed prior to determining if combinations of effects would be evaluated

- April 2, '85: NRC letter indicated that "effect of combinations of parameters should be assessed"

Comments - Per HCOG Program Plan Task 9.21, the results of scoping tests will be presented to, and discussed with the NRC staff

- It is not possible before the scoping tests are completed to determine if variations in some parameters be combined

Issue: Effects of Blockage

HCOG Position - The 1/4 scale facility adequately simulates major geometric blockages which exist in full-scale facilities

History - Feb 20, '85: In HCOG-NRC meeting, HCOG proposed completion of an additional scoping test to assess the effects of blockage. If blockage is a significant effect, high blockage fractions will be used in all diffusion flame tests

- April 2, '85: NRC letter states that" no criteria addressing the simulation of equipment blockage either in the horizontal or vertical direction" exists in Program Plan.

Comments - Acceptance criteria not required due to inclusion of new scoping test

NOT VALID

THERE ARE VAGUE CRITERIA ADDRESSING THE SUBJECT OF OTHER SCOPING TESTS.

- Effects of vertical blockage are insignificant

1) Horizontal flow is not dominant pattern

2) Degree of vertical blockage not sufficient to impede flow

ISSUE: STEAM RELEASE RATE CAPABILITIES

HCOG POSITION - THE 1/4 SCALE FACILITY CAN SIMULATE STEAM PRODUCTION FROM A 300 GPM REFLOOD. THIS HYDROGEN RELEASE HISTORY PRODUCES THE LIMITING DIFFUSION FLAME THERMAL ENVIRONMENT

HISTORY - FEB 1, '85: IN HCOG-NRC MEETING, NRC REQUESTED ACCEPTANCE CRITERIA FOR STEAM RELEASE RATE CAPABILITIES

- FEB 28, '85: REVISION 2 TO THE PROGRAM PLAN MODIFIED ACCEPTANCE CRITERION 3 FOR TASK 9 TO INDICATE: "THE FACILITY SHALL HAVE THE ABILITY TO SIMULATE STEAM FLOWS ASSOCIATED WITH THE HYDROGEN RELEASE HISTORY WHICH PRODUCES THE LIMITING DIFFUSION FLAME THERMAL ENVIRONMENT..."

- APRIL 2, '85: NRC LETTER STATES: "THE FACILITY CAPABILITY TO SIMULATE STEAM FLOW DOES NOT ADDRESS THE RANGE OF STEAM RELEASE RATES ASSOCIATED WITH HYDROGEN RELEASE TRANSIENTS".

COMMENTS - HCOG SEEKS APPROVAL OF 1/4 SCALE TESTING FACILITIES

Issue: Characterization of Spray Carryover

HCOG Position - HCOG has developed a conservative model which evaluates significant parameters involved in hydrogen generation events. Addressing characteristics of spray carryover would be excessive detail outside program scope

History - Feb '85: During several HCOG-NRC meetings this issue was addressed. HCOG agreed to measure volume of spray carryover in 1/4-scale facility and determine size of droplets. Measurements will be completed for scoping test and scoping test with blockage

- April 2, '85: NRC letter indicated that no acceptance criteria have been defined for spray carryover and spray carryover should be characterized by considering "...droplet or sheetflow geometries, velocities and temperatures."

Comments - Sheetflow carryover has been eliminated from 1/4 scale facility to the maximum extent possible

- Current approach acceptable for assessing effect on diffusion flame and verification of CLASIX-3

- Appears to involve excessive detail

- Validation of CLASIX-3 in 1/4 scale facility will use same methods to determine spray carryover, and allow assessment of conservatism in present plant response methodology.

Issue: Bulk Mixing Patterns (Spray-Induced Turbulence)

HCOG Position - The size of turbulent eddies in 1/4-scale facility is geometrically scaled, and turbulent intensities in the 1/4-scale are half of those in the prototype

History - Dec 8, '83: NRC letter requests additional information on "...comparability of the turbulence generated by sprays in test vessel versus what may be seen in a Mark III containment."

- April 2, '84: Via HGN-016, HCOG indicated that sprays and their resultant turbulence were adequately scaled for diffusive combustion

- April 2, '85: NRC letter indicates that Task 9, Criterion 3..."Does not address how HCOG will demonstrate that bulk mixing patterns in test facility are representative of bulk mixing patterns at full scale". Also, the letter indicates that the program plan does not address scaling of turbulence induced by containment sprays

Comments - Previous response accurately presents HCOG position with respect to scaling turbulence for diffusive combustion.

- The 1/4 scale facility scaling report demonstrates that bulk atmosphere mixing patterns will be preserved from 1/4 scale to full scale

BULK MIXING PATTERNS (SPRAY INDUCED TURBULENCE)
(CONT)

Comments (Cont)

- For deflagrations, test in 1/4 scale is intended to show CLASIX-3 provides very conservative predictions of deflagration phenomena

- CLASIX-3 treatment of combustion is very conservative regarding phenomena expected in 1/4 scale

  1) CLASIX-3 assumes instantaneous mixing in a volume and predicts volume burns

  2) HCOG expects localized combustion around igniters

- Dominant effect of sprays is to provide bulk atmosphere cooling

- If deflagration test shows appreciable change following actuation of sprays, HCOG will re-evaluate

Issue: Froude Modeling of Heat Sinks

HCOG Position - An Acceptance Criterion which addresses verification of Froude modeling of heat sinks has been developed to ensure heat loss in the 1/4-scale facility is conservative

History - Feb 20, '85: HCOG presents NRC a discussion of modeling of heat sinks in 1/4-scale facility

- April 2, '85: NRC letter requests an acceptance criterion be developed regarding validation of Froude modeling

Comments - Calculations indicate that bulk gas temperatures measured in the 1/4 scale test facility are greater than expected bulk gas temperatures in full scale facilities

- It isn't clear if only NRC concern on Froude modeling deals with modeling heat sinks

Issue: Scaling of Deflagration Test Data

HCOG Position - A deflagration event will be examined in the 1/4-scale facility to validate CLASIX-3. Phenomena observed in the 1/4 scale should generally be representative of phenomena at full scale. No basis exists for scaling 1/4 scale data to full scale.

History - 4/84 and 1/85: HCOG indicated in meetings with NRC that test results from 1/4-scale deflagrations cannot be scaled to represent full-scale events. NRC contended it was possible.

- April 2, '85: NRC letter indicates that staff is still seeking scaling of deflagration data

Comments - Deflagration test is being run solely to demonstrate conservatism of analytical approach (i.e., CLASIX-3)

- HCOG has met with combustion/Froude-modeling experts who have indicated that scaling of 1/4-scale deflagration test data to full-scale is not technically viable

Issue: - Inclusion of 75% MWR Hydrogen Release History in 1/4 Scale Test

HCOG Position: - Deflagration test in 1/4 scale facility is intended only to provide data for validating CLASIX-3. Deflagration thermal environment for equipment survivability analysis will be defined using CLASIX-3. There is no reason to include 75% MWR release history in test program.

History - In January 1985 HCOG-NRC meetings, NRC suggested HCOG should include 75% MWR history in facility.

- April 2, '85 NRC letter states HCOG should include 75% MWR history in test.

Comments - Current deflagration test allows adequate verification of analysis methodology

- Cannot scale data obtained in 1/4 scale test facility

- Nothing gained by putting 75% MWR release history in 1/4 scale

Resolve Open Items on Task 12

- Validation of HEATING-6 with Calorimeter Deflagration Data

- Pretest Definition of Input Parameters

- Validation of Equipment Response to Deflagrations Using Several Environments

Issue: Validation of HEATING-6 with Calorimeter Deflagration Data

HCOG Position - HEATING-6 will be validated by comparing its prediction of the calorimeter's response to the actual measured calorimeter response in a diffusion flame environment. The ability to conservatively predict calorimeter response to deflagrations will be assessed using CLASIX-3 wetwell predictions.

History - April 2, '85: This issue was initially identified in NRC letter which stated:"... The task description (Task 12) does not discuss validation of methodology for evaluating equipment thermal responses to deflagrations...."

Comments - HCOG commmits to validate methodology for equipment thermal response to deflagrations using calorimeter response to deflagrations and measured deflagration thermal environment.

Issue: Pretest Definition of Combustion Parameters

HCOG Position - Values defined as input combustion parameters to analytical codes in combination with code assumptions and approaches to use of code results are considered by HCOG to be conservative. Conservative nature of these values, assumptions and approaches will be verified by results of 1/4-scale tests and comparisons with CLASIX-3 calculations

History - Jan 31, '85: In HCOG/NRC meeting, HCOG indicated that CLASIX-3 calculations would be completed before the test is conducted.

- April 2, '85: NRC letter indicated that pretest definition of combustion parameters is unnecessary pending availability of test data from 1/4 scale tests. Uniform mixture assumption throughout a volume may not be valid.

Comments - Intent of CLASIX-3 1/4-scale predictions is not to create an exact model, but to ensure conservatism exists in model that is used for developing thermal environments

- Approach is not to develop a best estimate 1/4 scale deflagration model using CLASIX-3

- HCOG recognizes combustion phenomena in 1/4 scale may differ from phenomena predicted by CLASIX-3. Intent is to show CLASIX-3 methodology is conservative.

Issue: Validation of Equipment Response to Deflagrations Using Several Environments

HCOG Position - Two diffusion flame environments will be used to validate equipment response data. One deflagration environment will also be examined

History - April 2, '85: NRC letter indicates a second deflagration environment may be required to acceptably assess equipment response calculations.

Comments - Calorimeter will be exposed to widely varying thermal environments during test.

- CLASIX-3 wetwell thermal environment is the most thermally limiting.