

TELECON: ECCS - SMALL BREAK LOCA ANALYSIS N4M-2-14

12-4-78 REF LTR K-5020

W10C144 C-K Requested by Carl Michelson

2:00

GPU EXHIBIT 480 FOR IDENT.  
3/18/82 W. A. RUDOLPH

8-671-1060 x2707

LHC Carl Michelson Lee Haack

B&W: Bob Lightle

Bob Jones

TVA: RLS Stu Thickman

Harry O'Brien

Jim McFadden

Lou Cartin

Dennis Renner

Henry Daily

Carl: What comments does B&W have on K-5020 and where do we go from here.

Bob L: Very detailed study - hard to respond w/o equally detailed study -  
are trying to get problem in perspective.

Carl: Question of vapor formation - Temp at hiest pt = temp at core exit  
(steam in U-bend)

Bob J: Steam bubble does form - natural circulation does cease

Carl: What is heat removal mechanism when natural circulation ceases.

Bob J: Pool boiling. When accident starts - lose offsite power - get  
natural circ mode thru system. At this time, bubbles form in  
core region and are carried throughout RCS. Steam pocket forms

8307060458 790803  
PDR ADOCK 05000289  
P HOL

XC40574

in upper portion of RV. Press of RV supports hydrostatic head in hot leg (?) - vent valves open - liquid depletes to cold leg elev and steam escapes thru the break.

Carl: Break isn't big enuf to take all heat out.

Bob J: Removal of all heat is not controlling factor in small break analysis. Trying to remove certain volume of steam. Some steam quenched by HPI.

Carl: We factored this into our analysis. Your predictions are based on larger breaks - small breaks don't behave the same way.

Bob J: You probably don't have any natural circulation for small break case.

Carl: Do you keep the core covered - If so, how do you know.

Bob J: Because of vent valve, will deplete system inventory - level will drop below secondary side of SG. At the time, will still have water in RV - if you have inventory in system, you have water in RV.

Carl: Do you disagree with my Figures 2 and 3?

Bob J: Haven't checked your numbers.

XC40575

Carl: Have to calculate to determine if core stays covered for breaks under  $.05 \text{ ft}^2$  - This is really all we're asking.

Bob J: We've looked at .05 break, in extrapolated to smaller breaks and concluded that covering the core is not a problem. NRC has accepted this, verbally, that smaller breaks are not a problem.

Carl: Need B&W to point out where your results differ from ours - your calculations are more sophisticated than ours so we want B&W to tell us where we're wrong.

Bob L: To give the answers you want will require a detailed calculation from B&W.

Bob J: We don't feel this effort is warranted.

Carl: Just reply to our K-5020 describing how you replied to NRC for breaks  $< .05 \text{ Ft.}^2$ . Not asking B&W to do a new analysis.

X040576

TELECON : ECCS - SMALL BREAK LOCA ANALYSIS NAM-2-K SHEET \_\_\_\_\_ OF \_\_\_\_\_

12-4-78 REF LTR K-5020

W10C144C-K Requested by Carl Michelson

2:00

COMPUTED

DATE

CHECKED

DATE

9-671-1060 &amp; 2707

LHC

Carl Michelson

Lee Hunt

BSW: Bob Lightle Bob Jais

TVA: RLS

Sta Thickman

Harry O'Shea

Jim McF

Lou Cortin

This is an authentic copy of my notes.

Dennis Borer Henry Daily

Signed: R.L. Simmons 8-3-79

- Carl: What comments does BSW have on K-5020 & where do we go from here
- Bob L: Very detailed study - hard to respond w/o equally detailed study - are trying to get problem in perspective
- Carl: Question of vapor formation - Temp at least fits a temp at core exit (steam is U-tube)
- Bob J: Steam bubble does form - natural circulation does occur.
- Carl: What is best control mechanism when natural circulation ceases
- Bob J: Pool boiling. When accident starts - lose electric power - get natural circ inside. Then circulation, as this time, bubbles form in core region and are carried through out. BSW steam pocket forms in upper portion of RV. Press of RV supports hydrostatic head slightly - vent valves open - liquid depletes to cold leg side & steam escapes thru the break.
- Carl: Break isn't big and it starts all hot water.
- Bob J: Removal of all heat is not controlling factor in small break analysis. Trying to remove natural volume of steam. Some steam quenched by HPL.
- Carl: We factored this into our analysis. Your predictions are based on larger breaks - small breaks don't behave the same way.
- Bob J: You probably don't have any natural circulation for small break case.
- Carl: Do you keep the core covered - If so how do you know
- Bob J: Because of vent valve, will deplete system inventory - level will drop below secondary side of SG. At this time, will still have water in RV - if you have inventory in system, you have water in RV.
- Carl: Do you disagree with my Figures 2 & 3?
- Bob J: Haven't checked your numbers.
- Carl: How do calculate to determine if core stays covered for breaks under 105 ft<sup>2</sup> - This is really all we're asking.
- Bob J: We're looking at 105 break, ~~which~~ is extrapolated to smaller breaks & concluded that covering the core is not a problem. NRC has accepted this, verbally, that smaller breaks are not a problem.
- Carl: Note BSW to point out where your results differ from ours - Your calculations are more sophisticated than ours so we used BSW to tell us where we're wrong.
- Bob L: To give the answers you want will require a detailed calculation from BSW. ~~The book~~
- Bob J: We don't feel this effort is warranted.
- Carl: Just reply to our K-5020 describing how you replied to NRC for breaks < 105 ft<sup>2</sup>. Not asking BSW to do a new analysis.

XC4C576A