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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

8-671-1060 x2707

LHC Carl Michelson Lee Haack

B&W: Bob Lightle

Bob Jones

TVA: RLS Stu Thickman

Harry O'Brien

Jim McF...

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

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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 that 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.

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Carl: Have to calculate to determine if core stays covered for breaks under .05 ft² - 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 Ft.². Not asking B&W to do a new analysis.

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

12-4-78 REF LTR K-5020

WIOCI44C-K Requested by Carl Michelson

2:00

COMPUTED

DATE

CHECKED

DATE

8-671-1060 x2707

EHC

Carl Michelson

Leo Haack

BAW: Bob Lightle Bob Jones

TVA: RLS

Stu Thickman

Henry O'Brien

Jim McF Lou Curtin

This is an authentic copy of my notes.

Dennis Binner Henry Daily

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

- Carl: What comment does BAW have on K-5020 & where do we go from here
- Bob L: Very detailed study - hard to respect w/o equally detailed study - are trying to get problem in perspective
- Carl: Question of vapor formation - Temp at best fit = temp at core exit (steam is U-bend)
- Bob J: Steam bubble dry form - natural circulation dry cores
- Carl: What is best removal mechanism when natural circulation ceases
- Bob J: Fuel boiling. When accident starts - lose offset power - get natural circ made then system. At this time, bubbles form in core region and are carried throughout RCS. Steam pocket forms in upper portion of RV. Press of RV supports hydrostatic head initially - vent valves open - liquid depletes to cold leg elev & steam escapes thru the break.
- Carl: Break isn't big and it sets all hot fuel.
- Bob J: Removal of all hot is not controlling factor in small break analysis. Trying to remove certain volume of steam. Some steam quenched by HPI.
- Carl: We featured 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 valves will deplete system inventory - level will drop below secondary side of SG. At that time, will still have water in RV - if you keep 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: Have to calculate to determine if core stays covered for breaks under 205 ft^2 - This is really all we're asking
- Bob J: We've looked at 205 break , ~~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: Need BAW to point out where your results differ from ours - Your calculations are more sophisticated than ours so we want BAW to tell us how we're wrong.
- Bob L: To give the answers you want will require a detailed calculation from BAW. ~~What~~
- 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 $< 205 \text{ ft}^2$. Not asking BAW to do a new analysis.

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