6-12-85

To: Dr. Tom Jungling of NRC 427-4540

From:

Aerospace

Dr. Lawrence P. Boesch 488-6393

Dr. Robert B. Moler 488-6088

Problems we observe with respect to corrosion work at BWIP based on 18 & 19 June Corrosion Panel Materials Review Board Meeting. (and the NWTS meeting at Livermore)

1. BWIP is not indicating work on Radiolysis chemistry. This should be done along with the geochemistry of the waste package

2. Be sure BWIP considers all aspects of uniform corrosion - i.e. as a function of
   (a) Temperature (low, middle & high ranges)
   (b) High temp. followed by low temps.
   (c) High temp & radiolysis
   (d) Extremes of geochemistry
   (e) High temp with packing contacting the canister - a followup of the lower corrosion rate at 250°C vs higher rate at 150°C

3. Localized Corrosion has been given a back seat by BWIP. Find out what is really being done and by whom at BWIP with regard to this corrosion. The conditions above apply -- also is there passivation occurring after reaching certain depths or pit sizes? If so, under what conditions? Is pitting being looked at when material is understress? What is the distribution of the pit depth as a fct. of (a) temp., (b) chemistry, & (c) radiolysis.

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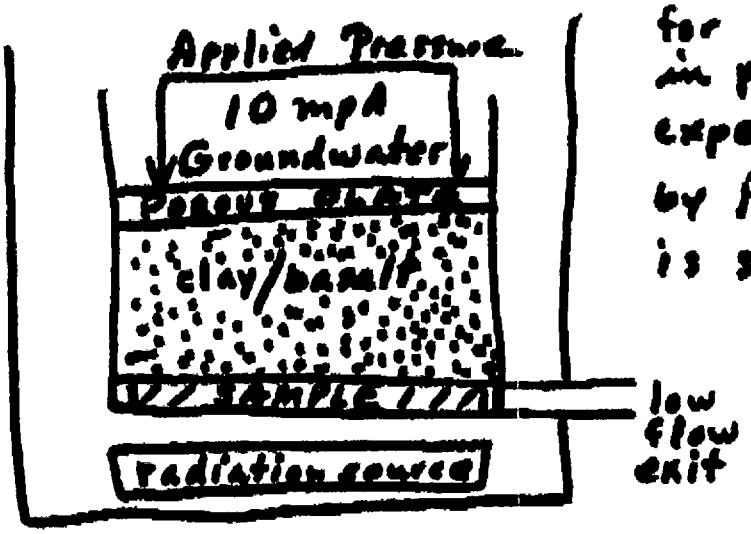
To: Dr. T. Jungling
From: Drs L. Boesch and R. Moler of Aerospace

4. Welding corrosion is not being reported by BWIP. (a) This, we feel, will be a source for failure of the canister at a time less than from uniform or pitting (localized) corrosion in non-welded areas of the canister.
(b) Are there plans at BWIP to model the stresses on the welded area(s) and relate the corrosion depths at the welds to failure of the canister? I would suspect SCC would be prevalent at the welds compared to SCC in other areas of the canister.

5. SCC in general needs to be addressed in the BWIP environment. What is BWIP doing here? Is BWIP combining crack growth with BWIP environments and SCC?

6. Dr. Moler recommends performing an experiment for corrosion, as suggested in point 1. based on an experimental apparatus used by Pusch, and others. This is shown at the left.



The experiment ought to be statistically designed

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To: Dr. T. Jungling
From: Drs. L. Boesch & R. Miller of Aerospace

7. Please find out what the latest status is with regard to spent fuel cladding at BWIP, if any, and at TUFF. Also, please ask what has been done on spent-fuel dissolution at BWIP and who is doing it. I look at spent fuel dissolution as a corrosion problem, but BWIP & NNWSI may look at it differently. At least NNWSI is considering corrosion of the cladding and the contribution of a partial barrier from the breached cladding.

By the way, is research being carried out on stainless steel cladding, besides on Zircaloy which I know HEDL is doing

Thank you for your help, Tom.

Sincerely
Larry Boesch

FACSIMILE

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