



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

102 LPDR  
WM-11 (2)

MAR 8 9 1987

MEMORANDUM FOR: Tom Jungling, WMEG/WM/NMSS  
FROM: Michael McNeil, WMB/DES/RES  
SUBJECT: STRESS CORROSION CRACKING OF COPPER

At the National Association of Corrosion Engineers conference in San Francisco there were two papers dealing with stress corrosion cracking of copper, one by Galvele of the Argentine atomic energy authority, and the other by Cassagne and Kruger from Hopkins. They were attended by a large and attentive group of NNWSI contractors, and since the results presented in the papers appeared to be somewhat contradictory, I should like to record my views before the question of copper SCC arises in a pre-licensing meeting.

Copper and copper-rich alloys often show SCC in solutions containing ammonia.

Copper and copper-rich alloys sometimes show SCC in solutions containing nitrate or nitrite ions.

Copper and perhaps copper-rich alloys can be made to show a loss of ductility in the presence of some low-melting-point copper compounds, especially CuCl<sub>2</sub>. The observations of this phenomenon appear to have been made under circumstances where no liquid water was present, and I think they have more in common with liquid metal embrittlement than with failure normally termed stress corrosion cracking. Furthermore, the losses of ductility reported are not such as to make Cu brittle by any normal standards (even embrittled by this process, Cu shows 25% reduction in area).

I believe that if it is proposed to use copper containers in HLW disposal, we shall have to address these issues, but I do not regard them (from what we know now) as critical problems.

*Michael McNeil*

Michael McNeil  
Waste Management Branch  
Division of Engineering Safety, RES

cc: P. Shewmon  
S. Parry  
J. Voglewede

87040651

WM Record File

WM Project 11

8705080040 870330  
PDR WASTE  
WM-11 PDR

Docket No. \_\_\_\_\_

PDR   
XLPDR  (2)

Distribution:

Jungling Voglewede

(Return to WM, 623-SS)

87 MAR 31 P4:46

WM DOCKET CONTROL CENTER

1219