

RAS 8303



Docket No. 50-413/414-OLA Official Exh. No. 41
 In the matter of Duke Catawba
 Staff IDENTIFIED 7/14/04
 Applicant _____ RECEIVED 7/14/04
 Intervenor _____ REJECTED _____
 Cont'g Off'r _____
 Contractor _____ DATE _____
 Other _____ Witness _____
 Reporter Ruben Salinas

Does M5™ balloon more than Zircaloy-4 under LOCA conditions ?

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DOCKETED
USNRC

August 9, 2004 (11:45AM)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

BACKGROUND

- At the PHEBUS-STLOC meetings in Washington DC (Oct 2003) and Madrid (Nov 2003), IRSN asserted M5 cladding may exhibit bigger balloons than Zy4 under LOCA conditions
 - Higher risk of flow blockage for M5 ?
- IRSN's statement is based on isothermal **creep tests** performed on Nb based alloys (published by CEA, EDF and FRA-ANP in Toronto and Annecy ASTM Meetings)
 - At high fluence with a low hydrogen content (150 ppm) M5 exhibits higher ductility than Zy4, with a higher hydrogen content (600ppm)



Temperature ramps on as-received M5 : ductility

Ductility decreases in the ramp test

