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## General Comment

A qualitative outstanding experimental work has been done by ANL. But some experimental data are still missing when the cladding?????????s strength is to be assessed in the frame of a licensing process.
From the ANL tests we learned, the more the cladding strains the more the hydrogen pick-up will be in the strained cladding. If the hydrogen content in the ballooned cladding is above 500 wppm, the cladding will completely loose its ductility. It is found that the secondary hydriding of the cladding for fresh as well as for irradiated cladding results in a hydrogen pick-up far above 500 wppm. This is observed for all levels of oxidation (ECR>2%) of the unstrained cladding. Therefore, the licensing approach with residual ductility of the cladding needs to be replaced by an approach which assesses the residual strength of the embrittled and ballooned cladding. For that, this minimal strength of the hydrided and strained cladding needs to be quantified.
Bending tests on the ballooned cladding as mentioned in the section ?????????Conclusion and Recommendations????????? chapter 7.3 ?????????Localized embrittlement in a balloon????????? of the report NUREG/CR-6967 will not give the correct picture. Bending tests induce axial stresses only. This is quite different from local bending forces in the cladding due to the localized rapid quenching process.
I would like to suggest performing tests in fuel rod bundles in at least 4*4 or larger arrays which provide the realistic fixing of the fuel rods by spacers. Such a LOCA

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test under realistic quench condition with realistic internal pressure in the fuel rod provides the most realistic loads on the strained and ballooned claddings and therefore can demonstrate that quenching will not disintegrate the ballooned cladding.
This test approach can help to overcome the safety issue on embrittled claddings revealed by ANL.