
Title	Pre-Project on Development and Validation of Melt Behavior in Severe Accidents
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ISBN	87-7893-158-4
Date	June 2004
Project	NKS_R_2002_02
No. of pages	45+12
No. of tables	-
No. of illustrations	21
No. of references	56
Abstract	<p>Reactor safety's concern with severe accidents, since the TMI-2 accident led to almost twenty years of intense research efforts, which have resolved a number of severe accident issues. Lately, research has been concentrated on accident management and a number of LWR plants, around the World, have adopted severe accident guidelines (SAMGs) and strategies.</p> <p>In NKS, the safety advancements expected from the planned research work in the DELI-MELT Project includes (a) an assessment of the adequacy of the accident management schemes adopted currently for Nordic BWRs and PWRs, with respect to melt coolability, accident stabilization and basemat melt-through, (b) evaluation of the reasons for low explosivity of corium, (c) database and prediction methodology for lower head failure mode and timing, and (d) resolution of new issues (e.g. melt stratification).</p> <p>This report mainly consists of three chapters, the assessment of severe accidents, the remaining, unresolved issues of severe accidents and proposed research efforts to resolve these issues. This report reviews the state of the art of the various melt/debris coolability situations and ex-vessel steam explosions during the postulated severe accident scenarios, addresses the unresolved issues concerning the core melt loadings during the severe accidents, and further suggests the experimental facilities in the Nordic countries which could be potentially useful to resolve the issues.</p> <p>We believe that these issues in the order of priority are;</p> <ul style="list-style-type: none">• in-vessel coolability of the melt pool or particulate debris,• ex-vessel coolability of the melt pool or particulate debris,• energetics and fragmented debris characteristics of a steam explosion endangering the integrity of the BWR containments and• characteristics of vessel failure.
Key words	Severe accidents, melt coolability, steam explosions, vessel failure, containment failure
