

CERTIFIED

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PROPOSED MEETING SUMMARY/MINUTES FOR
ACRS CLASS-9 ACCIDENTS SUBCOMMITTEE MEETING
FEBRUARY 25, 1985 - WASHINGTON, D.C.

Purpose: The Subcommittee met with the NRC on February 25, 1985 to review the Staff's current suite of severe accidents codes excluding MELCOR and the containment codes.

Principal Attendees:

ACRS

W. Kerr, Chairman
D. Ward, Member
C. Mark, Member
D. Ward, Member
I. Catton, Consultant
J. Lee, Consultant
M. Bender, Consultant
M. Corradini, Consultant
P. Davis, Consultant
A. Wang, Staff, DFO

NRC

M. Silberberg
R. Wright
J. T. Han

C. Allison, INEL
J. Rest, ANL
W. Camp, SNL
M. Kuhlman, BCL

Introduction

W. Kerr opened the meeting by stating his objectives for this meeting were to:

- (1) determine the purpose of the codes,
- (2) determine who are the potential users,
- (3) what the stage of development of the various codes and the projected dates of completion,
- (4) is the code to be benchmarked or validated and what is the difference between these two? and
- (5) is the use of the code for plant specific analysis or generic analysis or evaluation of operating plants?

APS Report

M. Silberberg gave a brief summary of the APS report. He stated there were no "surprises" and that the 18 areas in which the APS determined further research is needed, the Staff has ongoing research programs. He believes the APS report will have a minimal impact on the current RES severe accident research program (SARP). M. Bender noted the APS recommendations are fairly inclusive and seems to lend little direction on what the priorities of the SARP should be. M. Corradini inquired, based on the APS comments, can the Staff at least say the WASH-1400 source terms are adequate. D. Ward noted the APS recommendations for further in-pile work and asked if this strengthens the Staff's decision to do more in-pile work.

Overview of Codes

M. Silberberg stated the Staff proposed to discuss the following SCDAP, FASTGRASS, MELPROG and TRAP-MELT. He noted there are 18 areas of major technical differences between NRC and IDCOR. Today's discussion would

address seven of these areas, which are all related to in-vessel phenomena. W. Kerr asked what meant by best estimate and are any of the codes validated. J. Han stated best estimate means using state of the art codes with no intentional use of conservative assumptions. He also noted at this point none of these codes had been validated. M. Corradini stated some of the code work seems duplicative. W. Kerr asked what level of confidence the Staff has in the codes, for instance with SCDAP at what percentage of core melt would they still have confidence in the computed results. M. Corradini asked who will be the users of SCDAP? M. Bender asked what does SCDAP provide in terms of the regulatory process? R. Wright stated the British are using SCDAP for some of their Sizewell B analysis, the Germans propose to use it, and the labs have used it to provide some pre-test conditions. J. Han noted a current regulatory use is that SCDAP is being used to predict hydrogen generation rates for comparison with the hydrogen control owners group Heat-up code results.

SCDAP

C. Allison (INEL) provided a status of the SCDAP code. He stated SCDAP is currently the best available code for analysis of TMI-2 like accidents. W. Kerr asked does C. Allison believe SCDAP can be used for licensing decisions. C. Allison replied yes, but one would have to use the bounding limits available in the code. C. Allison stated a draft users manual is available. This manual includes an explanation of theories and models. Most of the models are based on separate effects experiments and hopefully will be confirmed with the integral

experiments. I. Catton stated in many cases the modeling does not fit the physical situation. How can these uncertainties be accounted for. C. Allison stated an internal paper review of the SCDAP models has been drafted and he will supply a copy to the Subcommittee. He stated the most important data base is probably the TMI-2 examinations. He noted a camera has been inserted into the lower head where a massive amount of man-made material has been observed. This to him would indicate that the TMI-2 core had a gradual progression (candling effect) of melting and not a situation where the core was a molten pool of material with a well defined melt front. He noted an integrated code (SCDAP-RELAP-TRAP-MELT) is scheduled to be released April 1, 1985. He expects it will be at least two years before this code would be assessed. I. Catton inquired if SCDAP is a one-dimensional code. He was concerned with the Staffs use of multi-regional analysis as multi-dimensional analysis.

FASTGRASS

J. Rest stated the objectives of this code is to provide a physically realistic capability for the prediction of fission product releases from nuclear fuel during both normal and accident conditions. The scope is fission product behavior in nuclear fuel exhibiting cylindrical symmetry. He noted FASTGRASS is not currently in SCDAP. SCDAP uses PARAGRASS which has a scaling model for the iodine-cerium release which is the major difference with FASTGRASS. However, the most recent version of FASTGRASS and PARAGRASS are not currently being used in SCDAP due to budgetary restraints.

MELPROG

W. Camp stated MELPROG is to provide detailed estimates for the release of steam and water, hydrogen, fission products, and core and structural materials from the vessel and the reactor coolant system during an unprotected meltdown accident. W. Kerr asked how will this code be used in regulation. M. Bender asked will this set of computations wind up with a bottom line number. I. Catton noted the development of MELPROG sounds very similar to SIMMER. M. Corradini agreed and asked if this was the case why SNL did not start with SIMMER and alter it. R. Wright stated the Commission will make a decision regarding the source term reassessment and severe accidents by 1986. The Staff is attempting to provide the Commission with a state of the art tool to help them in their decision making process. W. Kerr inquired what level of uncertainty will be acceptable for the Commission to make a decision. R. Wright stated the Commission must decide how much uncertainty is acceptable, but his understanding is the Commission will make a decision in 1986 independent of where the state of knowledge is at. W. Kerr said he understands it is a Commission decision, but surely the Staff will give the Commission guidelines as to what level of confidence the Staff has in the codes and what are acceptable uncertainty levels in the analysis. W. Camp stated he considers MELPROG an exploratory code. SNL could not start with SIMMER because of various reasons including differences in radiative heat transfer, unequal liquid fuel and liquid coolant velocities and the numerical methods used. W. Camp doubted if there would ever be enough test to completely validate and verify MELPROG.

However, he hoped in two or three years to get the uncertainty level to 30 or 40 percent. He stated MELPROG should be a reasonable tool for regulation in 1986.

TRAP-MELT

J. Gieseke stated TRAP-MELT is a code for predicting fission product transport and deposition in the RCS under severe accident conditions. He noted TRAP-MELT has been used in the BMI-2104 work, PBF analyses, by IDCOR, by NYPA, by ORNL, and by UK for Marviken analyses and sensitivity studies.

NOTE: Additional meeting details can be obtained from a transcript of this meeting available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C. or can be purchased from ACE-Federal Reporters, 444 North Capitol Street, Washington, D.C. 20001, (202) 347-3700.