

NRC BHD WSH

BHD WSH

610183 ENEA I

ZCZC

610183 ENEA I

TELEX NR.2446

MEL SILBERBERG

TELEX 7108240412

SUBJEC:SOURCE TERM REPORTS PEER REVIEW. IN THE FOLLOWING SOME NOTES AND REMARKS ARE LISTED AS A CONSEQUENCE OF THE SECOND PEER REVIEW MEETING OF MAY 24 AND 25. FIRST OF ALL LET ME EXPRESS YOU AGAIN THE APPRECIATION OF MY ORGANIZATION FOR INVITING US IN THE REVIEW ACTIVITIES. I WANT ALSO TO TELL YOU THAT THE INFORMATION AND RESULTS PRODUCED BY NRC AND BY ITS CONTRACTORS IN THE COURSE OF THE WORK ARE EXTREMELY USEFUL TO US IN OUR EFFORT TO ACQUIRE THE MOST UP TO DATE METHODS FOR SEVERE ACCIDENTS SOURCE TERMS EVALUATIONS. IN THIS FRAME, IT SEEMS TO ME THAT VOLUME 2 OF BMI 2104 MARKS A PROGRESS OVER VOLUME 1 BECAUSE IN VARIOUS POINTS IT UNDERSCORES THE IMPORTANCE OF A CAREFUL EVALUATION OF PLANT PHENOMENA LIKE PENETRATION BEHAVIOUR BESIDES FISSION PRODUCT CHEMICAL-PHYSICAL PHENOMENA. I AM CONFIDENT THAT UNDER THE

RECTION OF YOUR NRC OFFICES, THE FINAL PRODUCT OF THE SOURCE TERM REASSESSMENT ACTIVITY WILL IN DUE TIME BUILD UP TO A COMPLETE PACKAGE OF REFERENCE INFORMATION AND EVALUATION RESULTS SUCH TO BE OF GUIDANCE IN US AND ABROAD FOR REALISTIC YET CAUTIONS EVALUATIONS OF SOURCE TERMS. I ADD SOME GENERAL AND SPECIFIC NOTES AND REMARKS IN ORDER TO CONTRIBUTE TO THE BEST I CAN IN THIS EFFORT. THE FOLLOWING FACTS, RESULTING FROM THE STUDIES AND THE DISCUSSIONS, SHOULD FIRSTLY BE ACKNOWLEDGED. ACCIDENT SEQUENCES AS IDENTIFIED BY WASH 1400 DON'T GIVE PER SE ENOUGH INPUT DATA FOR FISSION PRODUCT CALCULATIONS: FURTHER ASSUMPTIONS: EITHER CONSERVATIVE OR BEST-ESTIMATE ONES, ARE NEEDED FOR THAT (E.G. MODE AND TIME OF CONTAINMENT FAILURE): OVERALL CALCULATED DECONTAMINATION FACTORS ARE VERY SENSITIVE TO THESE ASSUMPTIONS: BATTELLE, IN ABSENCE OF OTHER GUIDANCE DATA HAS GENERALLY TAKEN THESE ASSUMPTIONS IN A CONSERVATIVE WAY: THUS RATHER LOW AND PROBABLY UNREALISTICALLY LOW OVERALL O.F. ARE BEING CALCULATED. THE WORK PERFORMED TO DATE THUS DEMONSTRATES THAT THE USE OF THE MOST UP TO DATE DATA AND CODES FOR THE CHEMICAL-PHYSICAL STUDY OF F.P. DOES NOT CONDUCT, TAKEN ALONE, TO A SOURCE TERM WHICH MAY BE CONSIDERED IN AGREEMENT WITH THE EXPERIENCE OBTAINED BY THE OBSERVATION OF REACTOR ACCIDENTS. MORE WORK IS NEEDED IS PARALLEL ON PLANT SYSTEMS BEHAVIOUR AND CONTAINMENT PERFORMANCE IN ORDER TO SUPPLY F.P. SPECIALISTS WITH A SET OF MORE REALISTIC PLANT BEHAVIOUR AND CONDITIONS ASSUMPTIONS TO BE USED AS AN INPUT FOR THEIR CALCULATIONS. IT IS MY UNDERSTANDING THAT THIS WORK HAS BEEN INITIATED IN THE

112057

Page I of II

x 274260

S/S

PETRANGELI

Silberberg
Page II 72

FRAME OF TWO SEPARATE NRC PROGRAMS (ACCIDENT SEQUENCES AND CONTAINMENT). IN ORDER TO CLEARLY DEFINE THE WORK PROGRAM I THINK THAT, FIRST OF ALL, IT HAS TO BE DECIDED WHAT KIND OF SEQUENCES SHOULD BE CHOSEN FOR SEVERE ACCIDENT SOURCE TERM EVALUATIONS. A POSSIBLE CHOICE COULD BE REPRESENTED BY THE RISK DOMINANT WASH-1400 SEQUENCES IN WHICH, BESIDES THE SET OF EVENTS WHICH DEFINE THE SEQUENCE ITSELF, FURTHER BEST-ESTIMATE PLANT BEHAVIOUR ASSUMPTIONS BE MADE (AS SAID BEFORE, THE SET OF EVENTS WHICH DEFINE THE SEQUENCE IS NOT A SUFFICIENT INPUT FOR F.P. CALCULATIONS). CERTAINLY, THE CHOICE OF 'ANY THINKABLE SEQUENCE' IS NOT CORRECT IN THIS CONNECTION: ONE MAY JUST THINK OF THE NONSENSE OF CONSIDERING SEQUENCES LIKE THE R ONE (CATASTROPHIC PRESSURE VESSEL RUPTURE). SEQUENCES CHOSEN FOR THE BMI 2104 WORK ARE OF A DIFFERENT KIND. THEY INCLUDE WASH 1400 RISK DOMINANT SEQUENCES WITH ADDITIONAL CONSERVATIVE PLANT BEHAVIOUR ASSUMPTIONS AND FURTHER NON RISK DOMINANT SEQUENCES SELECTED IN ORDER TO EVALUATE PLANT D.F. IN A WIDER RANGE OF CONDITIONS. IN A CERTAIN SENSE BMI 2104 SEQUENCES ARE TYPICAL TEST CASES FOR F.P. CODE RUNS MORE THAN RATIONAL REFERENCE SEQUENCES FOR SOURCE TERM EVALUATIONS. THEY SERVE THE PURPOSE OF EXPLORING CODE POTENTIAL AND RESULTS IN A WIDE RANGE OF HYPOTHETICAL TRIAL CASES. FOR THIS REASON I THINK THAT THE TITLE AND THE INTRODUCTION OF BMI 2104 SHOULD BE REVISED. AS FAR AS THE TITLE IS CONCERNED, I WOULD SUGGEST TO DROP THE 'LWR SPECIFIC SEQUENCES' WORDING AND TO REPLACE IT WITH SOMETHING LIKE 'LWR HYPOTHETICAL CODE TEST SEQUENCES' IN THE INTRODUCTION, IT SHOULD BE CLEARLY STATED THAT THIS WORK IS ONLY THE FIRST PART OF A MULTIDISCIPLINAR AND ITERATIVE WORK FOR SOURCE TERM REASSESSMENT. NO HINT SHOULD TRANSPARE THAT BMI 2104 MAY BE USED, PER SE, TO SUPPLY WORKING SOURCE TERM DATA FOR EITHER REFERENCE ENVIRONMENTAL CONSEQUENCES OR FOR EQUIPMENT QUALIFICATION EVALUATIONS. FOR THE LAST, IN PARTICULAR, BMI 2104 RESULTS MAY BE SIGNIFICANTLY UNCONSERVATIVE. FOR THE PARALLEL WORK ON PLANT BEHAVIOUR, THE FOLLOWING POINTS SEEM TO ME OF SPECIAL SIGNIFICANCE: - COMPLETE COVERAGE OF ALL THE AVAILABLE PLANT SYSTEMS AND PHENOMENA (E.G. STAND BY LIQUID CONTROL SYSTEM, CONTROL ROD DRIVE COOLING SYSTEM, CONTAINMENT VENT LINES FOR BWRs AND PUMP SEAL BEHAVIOUR IN ACCIDENTS FOR PWRs, WATER LOCATION AND CONDITIONS IN THE PLANT FOR BOTH). - CONTAINMENT ELECTRICAL PENETRATIONS AND PASSAGE GASKETS SHOULD CAREFULLY BE CONSIDERED IN THE CONTAINMENT FAILURE MODE AND TIMING EVALUATIONS. RELEVANT PHENOMENA MIGHT BE: ORGANIC MATERIAL DEGRADATION DUE TO COMBINED PRESSURE, TEMPERATURE AND RADIATION EFFECTS CONDUCTING TO THE OPENING OF LEAK PATHS: AEROSOL DEPOSITION IN LEAK PATHS WITH TWO POSSIBLE CONSEQUENCES: PATH PLUGGING OR FURTHER PENETRATION DAMAGE DUE TO DECAY HEAT OF DEPOSITED AEROSOLS (BATTELLE EVALUATED 400°F TEMPERATURE INCREASE OF STRUCTURES WHERE AEROSOLS WERE DEPOSITED). - EVALUTATION OF CONTAINMENT SUBCOMPARTMENTS THERMAL HYDRAULIC CONDITIONS. - CONSIDERATION OF HUMAN FACTORS NOT ONLY AS A SOURCE OF ERROR BUT ALSO AS CONDUCTIVE TO RECOVERY AND REPAIR ACTIONS DURING ACCIDENTS (SEE E.G. WASH 1400 APPENDIX XI PAGE 3-50 AND FOLLOWING, BROWNSFERRY FIRE).
HANKYOU AGAIN AND BEST REGARDS.

G.PETRANGELI ENEA DISP ROMA