Foreign Travel Quick Look Report (and Final Foreign Travel Trip Report)

TRAVELER:

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DATES AND LOCATIONS:

February 1 - 6, 2009, Montreal, Canada

ORGANIZATIONS/COMMITTEES:

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Subcommittee on Nuclear Power.

Committee Meetings Attended:

(1) Subgroup (SG) on Nuclear Packaging (NUPACK), Section III, Division 3,
(2) Working Group (WG) on Design of Containments, Section III, Division 3,
(3) Working Group (WG) on Design Methodology, Section III, Division 1, and
(4) Task Group (TG) on Computational Modeling for Explicit Dynamics, Section III, Division 1.

DESIRED OUTCOME:

(1) Continued progress toward updating and developing the ASME Code Section III, Division 3 Rules for the design, fabrication, testing and inspection of storage and transportation containments and internal support structures.

(2) Development of strain-based acceptance criteria for energy limited accident events to a point where the criteria document can be voted on by the Working Group (WG) on Design Methodology, Section III, Division 1.

(3) Continued progress toward the development of a computational modeling guidance document for explicit dynamics finite element methods to aid both applicants and NRC in the development and review of complex drop impact and aircraft crash models to achieve acceptable levels of accuracy.

RESULTS ACHIEVED:

All desired outcomes were achieved.

SUMMARY OF TRIP

At the Subgroup (SG) on Nuclear Packaging (NUPACK), Section III, Division 3 and the Working Group (WG) on Design of Containments, Section III, Division 3 meetings, we

discussed editorial and technical changes proposed by committee members to Section III, Division 3 Subsection WD on Design of Spent Fuel Baskets. WD has not yet been published so considerable changes were made. I proposed to include a revised table of plate buckling coefficients based on previous work that had been done by NASA (NACA) in the 1950's. The committee approved the revision. Considerable discussion took place regarding the terminology to be used for leak testing, leak tightness and specifying ANS 14.5. Additional discussions also focused on elevating the development of rules for bolted closures to our highest priority behind strain based acceptance criteria.

Spencer Snow from INL presented an update of the strain-based acceptance criteria for energy limited accident events to the Working Group on Design Methodology. I suggested two additions to the criteria; first, that the criteria should also apply to strains at the location of a blunt object impact, and second, that to account for uncertainty in test data, the minimum true fracture strain should be the 98% exceedence probability value. These changes were accepted by the committee. The revised strain-based acceptance criteria document was voted on by the committee and passed unanimously. It now moves on to the Working Group (WG) on Design of Containments, Section III, Division 3 for official Code wording to be developed. Dr. John Stevenson, who is also the chairman of the Joint ACI-ASME Section III, Division 2 Committee on Reactor Containment Structures, said he was going to try to adopt the strain-based acceptance criteria to evaluate containment liner integrity for aircraft crash events.

The Task Group (TG) on Computational Modeling for Explicit Dynamics, Section III, Division 1 continued its work toward the development of a quantitative modeling guidance document for explicit dynamics finite element codes. The entire meeting was devoted to developing a set of simple models (problems) to be used for mesh convergence studies to test the convergence of various response parameters (strain, displacement) for a variety of mesh sizes, element types and integration schemes.

NEXT STEPS:

The Working Group (WG) on Design of Storage and Transportation Containments, Section III, Division 3 will begin developing Code language to add strain-based acceptance criteria to Subsections WB and WC.

The Task Group (TG) on Computational Modeling for Explicit Dynamics, Section III, Division 1 will review and expand the set of convergence study problems and assign tasks to committee members.

POLICY ISSUES OR OTHER ITEMS OF INTEREST TO THE COMMISSION:

There are no actions that the Commission needs to take as a result of this meeting:

CONTACT INFORMATION:

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ATTACHMENTS:

None