UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 2, 1975

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Gus

V. Stello, Director, Division of Operating Reactors, NRR

INSERVICE INSPECTION OF CONTAINMENT STRUCTURES

Recent events which have directed our attention to inspections of BWR containments have brought to light the fact that there are presently no inservice inspection requirements for BWR containments other than the required containment leakage rate testing, and a general "visual inspection" requirement. The same situation appears to be true for PWR's, except that there are requirements for tendon surveillance in the case of prestressed structures.

We are aware that efforts have been initiated by ASME to develop inservice inspection requirements for steel containments, as well as concrete containments, but it is not anticipated that approved codes will be available for use for perhaps 2-3 years.

We believe that interim inservice inspection requirements for containment structures should be developed for use until the ASME Section XI Code has addressed these areas to assure that the integrity of containment liners, welds, coatings, and materials is being maintained. Verification of plate thickness and coating adherence should be addressed specifically in such requirements. Support members should also receive specific attention; these would include torus supports, relief valve discharge piping supports in both the drywell and torus and other supports for piping inside or attached to the containment structures. We recommend that DOR develop appropriate requirements to be incorporated in technical specifications. If you have questions regarding this matter, please contact K. V. Seyfrit, Chief, Reactor Technical Assistance Branch.

Boyce H. Grier, Director
Division of Reactor Inspection Programs
Office of Inspection and Enforcement

cc: J. G. Davis, IE
D. Thompson, IE
J. P. O'Reilly, Director, IE:I
N. C. Moseley, Director, IE:II
J. G. Keppler, Director, IE:III
E. H. Howard, Director, IE:IV
R. H. Engelken, Director, IE:V
R. S. Boyd, NRR
R. E. Heineman, NRR
G. A. Arlotto, SD

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memo to files –

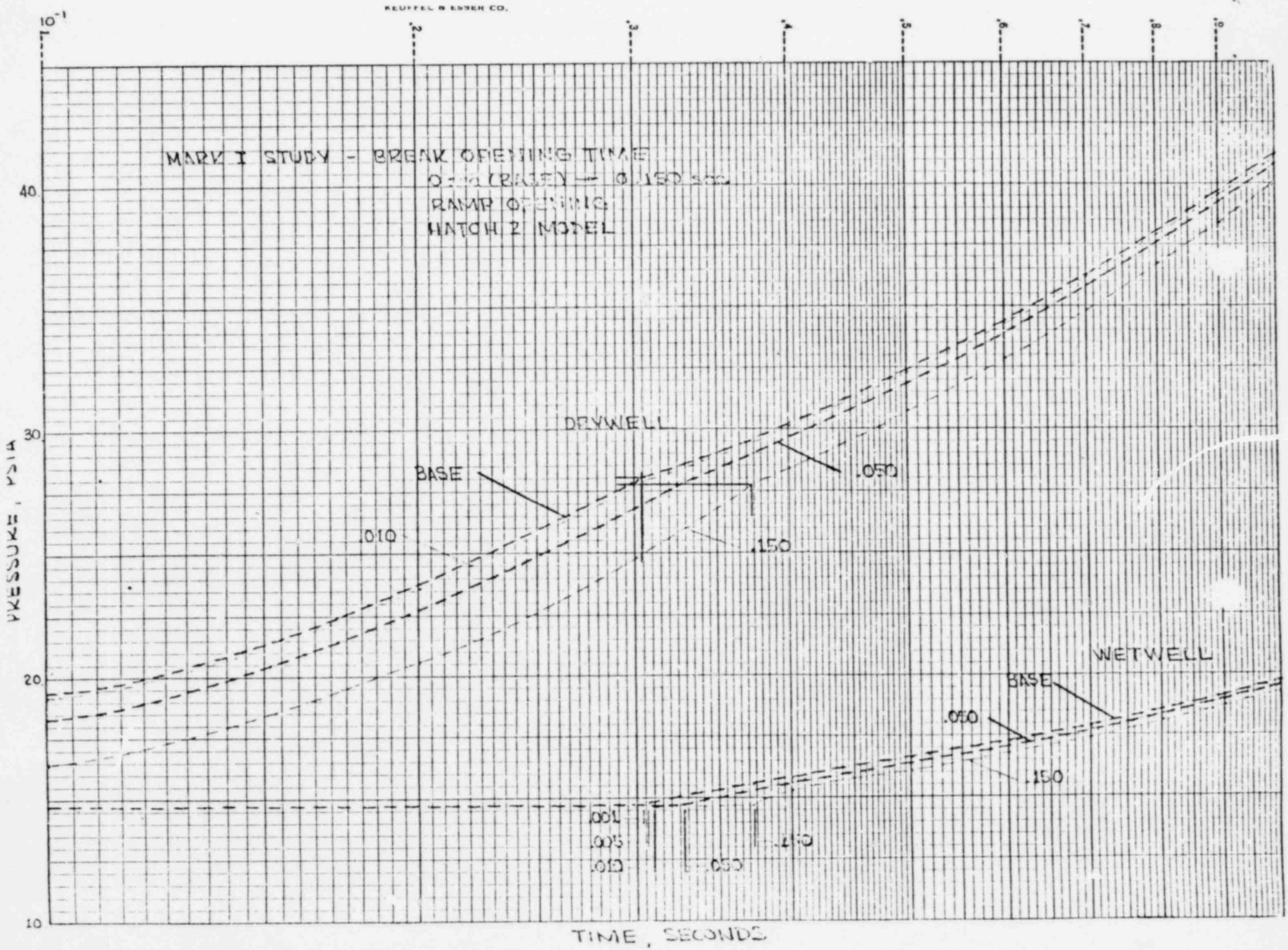
Mark I Break opening time study

The influence of break opening time was investigated by ramping the break flow to the critical rate. MEB indicated realistic opening times on the order of 30 - 40 milliseconds but probably no greater than 50 milliseconds. A spectrum of opening times was used with the Hatch 2 Contempt LT 21 model, ranging from 0. to 150 milliseconds (GE assumption).

With regard to pool dynamics effects, the following conclusions have been drawn:

(1) over the range 0 to .150 the change in vent clearing pressure is $\simeq$ 0.25 psi ($<$ 1%), therefore there will be negligible influence of break opening time on the downward torus load; especially considering the more realistic opening time of .050.

(2) the bubble charging rate, as evidenced by the rate of pressure rise in the wetwell, is essentially equivalent for all of the cases considered – therefore the upward torus load is insensitive to break opening time.


KEUFFEL & ESSER CO.
MARK I STUDY - BREAK OPENING TIME
RAMP OPENING
HATCH 2 MODEL
DRYWELL
BASE
.010
.050
.150
WETWELL
BASE
.010
.150
.001
.005
.010
.050
.150
PRESSURE, PSIA
TIME, SECONDS

The attached Table indicates the design pressure of the plants utilizing the Mark I type containment. The maximum calculated pressures and torus shell thickness for each plant are also indicated.

The tori of the Oyster Creek and Nine Mile Point Unit 1 plants are designed to a lower pressure than the remaining Mark I type plants. The reason for this difference in design pressure is not based on safety considerations, because the calculated pressure in all cases are below design, but on practical consideration for conducting the structural proof test. Oyster Creek and Nine Mile Point Unit 1 were the first plants utilizing the Mark I concept. Because of the difference in design pressure between the torus and drywell, the structural proof test of each structure (air pressure test at 1.15 of design) was different. This required that the torus and drywell be temporarily "blocked off" which required time and expense. The torus design pressure for the later plants was increased to the same as the drywell, so that both structures could be tested at the same time and at the same pressure.

Plant	Wall Thickness Inches	Peak Calculated Pressure Psig		Maximum*** Allowable Pressure Psig	
		Drywell	Wetwell	Drywell	Wetwell
Oyster Creek	.385	33	20	62	35
Nine Mile Point 1	.460	50	25	62	35
Monticello	.533/.584*	42	25	--62 both--	
Vermont Yankee	.583	43.5	27	--62 both--	
Fermi 2	.587/.658*	56.5	25.2	--62 both--	
Hatch 2	.540/.607*	57.5	27	--62 both--	
Brunswick	.375 liner**	49	28	--62 both--	
Dresden	.585/.653*	47	27	--62 both--	
Quad Cities	.582/.649*	47	25	--62 both--	
Millstone	.596 /.625*	43	25	--62 both--	
Pilgrim	.568/.629*	45	27	--62 both--	
Peach Bottom	.604/.675*	41.5	27	--62 both--	
Fitzpatrick	.568/.632*	45	26	--62 both--	
Cooper	.616	46.2	29	--62 both--	
Duane Arnold	.500/.534*	54	25	--62 both--	
Browns Ferry	.750	49.6	27	--62 both--	

*Top Thickness/Bottom Thickness

**Concrete Structure

***Based on Section III revision, this is indicated to be 56 psig (however, the capability of the containment remains at 62 psig).

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cc: EPEales
BABush
SCChang
GEGruen
JHRamsthaler
TDKnight-ID
JAKudrick-DSS
PHVanderHyde
ECLemmon
LPLeach
File C1.0

FORM INEL-561
(Rev. 1-76)

IDAHO NATIONAL ENGINEERING LABORATORY

MEMO OF CONVERSATION

Date 5/11/76 Time 1:00 pm Commitment Made _____ Yes X No _____

Person Calling L. Wheat et al Person Called J.A. Kudrick, N.Su

Representing INEL Representing G. Lainas(Part time) NRC-DSS

Purpose of Conversation Discuss INEL Review of G.E. Safety Relief Valve Analytical Models(LLW-18-76)

Text of Conversation B.A. Bush, S.C. Chang, L.L. Wheat of INEL and T.D. Knight of ID discussed the G.E. S/R Valve analytical model with DSS. Kudrick felt the reports of Mills and Chang were not in agreement, but INEL stated they are in general agreement, with different degrees of detail. INEL stated that a preliminary assessment of Quad Cities relief valve data did not show consistent model conservatism. Some items of Dr. Chang's report SRD-79-76 were discussed. DSS was concerned that the INEL documents would be considered, by other NRC persons, to be final positions on the GE models. As stated in LLW-18-76, additional model review is in progress, along with data review. The individual reports are final, but the model assessment is not final.

Kudrick requested INEL to contact the LOFT staff and obtain their current opinions on the GE S/R valve models, and to report back to him in one week on this item.

GE Amendment No.1 was briefly discussed. NRC(Su) will try to arrange a GE/NRC/INEL technical review meeting in the near future to resolve our concerns.

Signed L.L. Wheat Date 5/12/76

(continued)

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MEMO OF CONVERSATION

Mr. Lainas feels the LLW-18-76 cover letter was too public (NRC,ERDA, INEL only, not in public document room), and wants us to provide information to him(CSB) even more informally. Mr. Lainas wanted to know what our milestones were for this level of effort task, and we discussed what our plans were, as previously negotiated with Jack Kudrick. No specific milestones were agreed to, other than to provide level of effort to work on the BWR problems.

L.L. Wheat

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Aerojet Nuclear Company

Interoffice Correspondence

May 28, 1976

J. H. Ramsthaler JHR ltr.
TSB 59

BWR POOL PENETRATION AND SCALING STUDY - LLW-25-76

Reference: (1) JIMills, "BWR Pool Penetration and Scaling Study," SRD-77-76, June, 1976

This letter transmits Reference (1) to NRC and ERDA-ID for information. This work was completed in support of the BWR Analysis task of the I-214 program, and is a follow-up effort to a similar task documented at the end of FY-1975.

Copies of this letter and Reference (1) are being informally sent to the following NRC and ERDA personnel:

TDKnight
PELitteneker
JAKudrick
GLainas
ZRRosztoczy
PENorian
WLJensen
LSlegers

L. L. Wheat
Analytical Model Development Branch

cb

Attachments as stated

cc: BABush (2)
SCChang
EPEales epe
WHLee
LJMetcalfe
JIMills (2)
WJMings
RPMoore
CLNalezny
PHVander Hyde
File C2.0

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