

B 5/1/78

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)  
DISTRIBUTION FOR INCOMING MATERIAL 50-410

REC: CASE E G                      ORG: RHODE G K                      DOCDATE: 04/28/78  
NRC                                      NIAGARA MOHAWK PWR                      DATE RCVD: 05/01/78

DOCTYPE: LETTER      NOTARIZED: NO                      COPIES RECEIVED  
SUBJECT:                      LTR 1      ENCL 1  
INFO REQUESTED BY S. VARGA IN LTR DTD 04/06/78 RE: UTILITY REQUEST FOR  
EXTENSION OF LATEST COMPLETION DATE FOR CPPR-112.

PLANT NAME: NINE MILE POINT - UNIT 2                      REVIEWER INITIAL: XBT  
DISTRIBUTOR INITIAL: *me*

\*\*\*\*\* DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS \*\*\*\*\*

REQUESTS FOR EXEMPTIONS (ALL TYPES)  
(DISTRIBUTION CODE B006)

FOR ACTION:      BR CHIEF VARGA\*\*W/ENCL                      PROJ MGR KANE\*\*W/ENCL  
                    LIC ASST SERVICE\*\*W/ENCL

FOR INFO:      MOORE\*\*LTR ONLY(1)                      REGAN\*\*LTR ONLY(1)  
FOR INFO:      ~~NORRIS\*\*LTR ONLY(1)~~                      DUNCAN\*\*LTR ONLY(1)

INTERNAL:      REG FILE\*\*W/ENCL                      NRC PDR\*\*W/ENCL  
                    ~~T & E\*\*W/2 ENCL~~                      J MILLER\*\*W/ENCL  
                    T ABELL\*\*W/ENCL                      E.CASE W/ENCL.

EXTERNAL:      LPDR'S  
                    OSWEGO, NY\*\*W/ENCL  
                    ACRS CAT B\*\*W/16 ENCL

DISTRIBUTION:      LTR 30      ENCL 26                      CONTROL NBR: 781210181  
SIZE: 2P

\*\*\*\*\* THE END \*\*\*\*\*

*me d*  
*W*



NIAGARA MOHAWK POWER CORPORATION

NIAGARA  MOHAWK

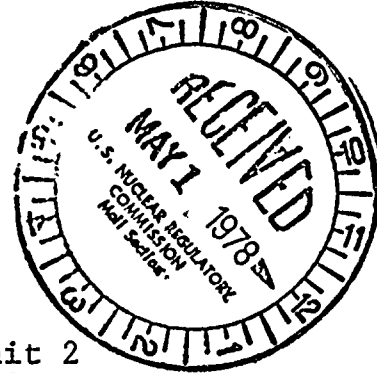
300 ERIE BOULEVARD, WEST  
SYRACUSE, N. Y. 13202

April 28, 1978

Mr. Edson G. Case, Acting Director  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Mr. Case:

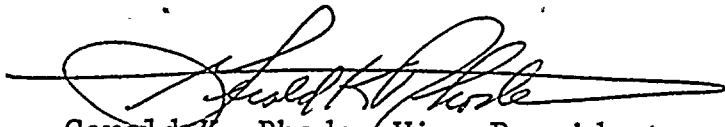
Re: Nine Mile Point Unit 2  
Docket No. 50-410



Enclosed is the additional information that Mr. Varga of your staff requested in a letter dated April 6, 1978 regarding the Niagara Mohawk Power Corporation request for an extension of the latest completion date for Construction Permit No. CPPR-112. This information quantifies the extent of the delay associated with each of the three causes cited. It also identifies on a time scale, the point at which the delay was incurred and the extent it alone affected the overall schedule for completion of the plant. The delays show good cause for extending the latest date of Construction Permit No. CPPR-112 to December 31, 1984.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

  
Gerald K. Rhode, Vice President  
System Project Management

NLR/szd

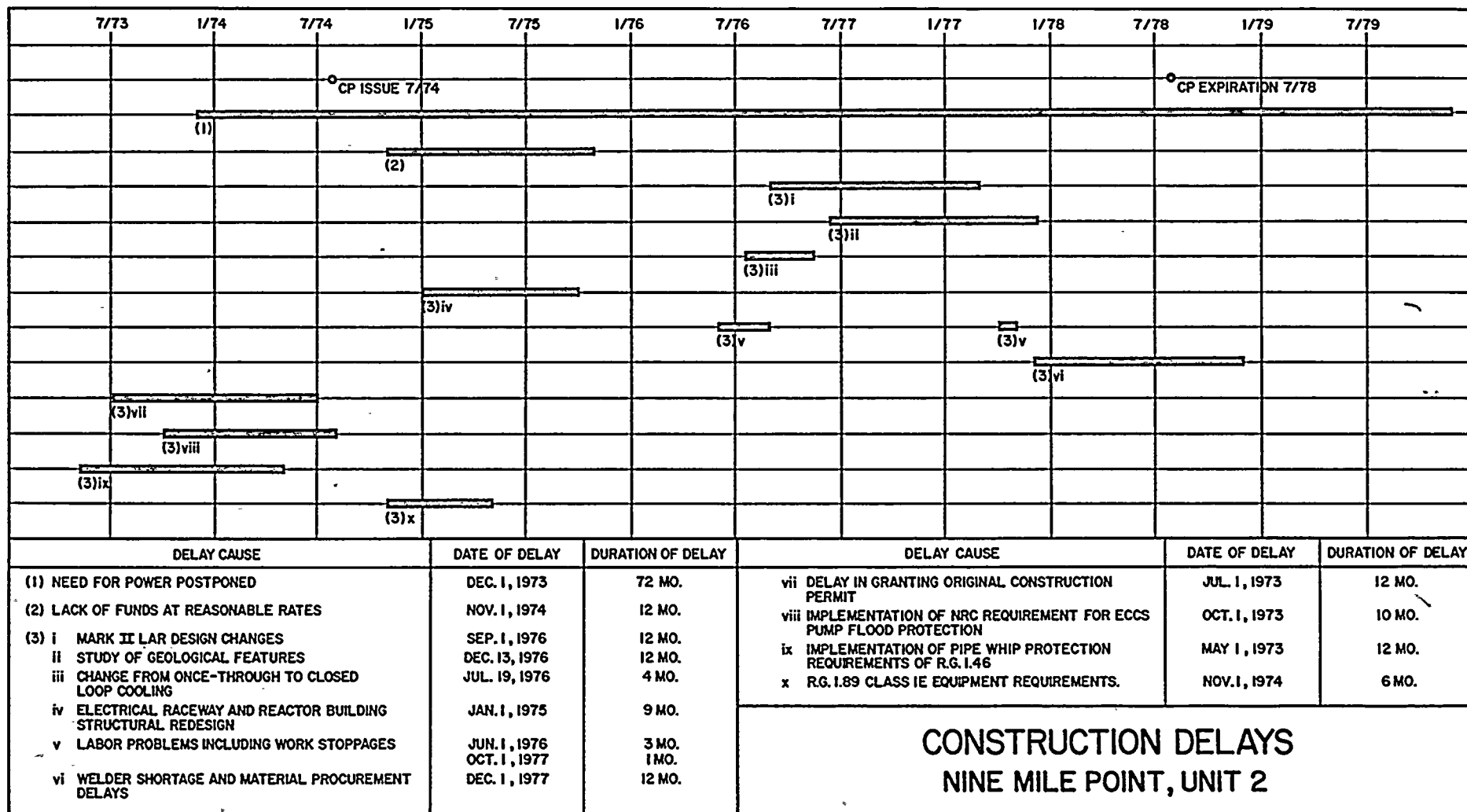
Enclosure

REGULATORY DOCKET FILE COPY

781210181

BOO6 / S / E \*





TELECOPIED	
TO <u>N. RADEMAKER</u>	
FROM <u>S. LINVILLE</u>	
TIME <u>3:45</u>	DATE <u>4/24/78</u>

666 - Auto

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
631 PARK AVENUE  
KING OF PRUSSIA, PENNSYLVANIA 19406

CENTRAL FILES

Docket No. 50-410

26 APR 1978

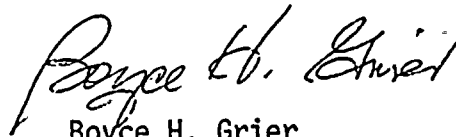
DRAVO Corporation  
Pipe Fabrication Division  
ATTN: Mr. Gustav Schwab  
Vice President and General Manager  
1115 Gilman Avenue  
Marietta, Ohio 45750

Gentlemen:

Subject: Niagara Mohawk Power Corporation Report of January 30, 1978  
Regarding the Dravo Pipe Fabrication Division Quality Assurance  
Program

We received your letter of April 7, 1978, concerning the subject  
report. Your letter will be made a part of the public record as you  
requested.

Sincerely,



Boyce H. Grier  
Director

may  
W





MEETING SUMMARY - Mark II

APR 25 1978

Doc. of File

IRC FOR

Local FOR

TIC

IRR Reading

LMR-21 File

E. Case

R. Bowl

R. DeYoung

D. Vassallo

J. Stolz

K. Kniel

O. Parr

S. Varga

L. Crocker

D. Crutchfield

F. Williams

R. Mattson

H. Denton

D. Muller

Project Manager: I. Peltier

Attorney, ID

E. Hyllon

IC (3)

ACPS (16)

L. Dreher

IRC Participants: C. Grimes

S. Rubenstein C. Anderson

R. Tedesco T. Su

G. Lainas K. Herring

J. Knight A. Hafiz

SD-40

me  
W





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

APR 25 1978

Docket Nos: 50-358  
50-387  
50-352/353  
50-367  
50-373/374  
50-388  
50-410 ✓  
50-322

APPLICANT: MEMBERS OF MARK II OWNER'S GROUP

SUBJECT: TRIP TO LIVERMORE, STANFORD RESEARCH INSTITUTE AND  
GENERAL ELECTRIC TO DISCUSS MARK II POOL DYNAMIC LOADS

Background

The purpose of this trip was to discuss several analytical and experimental programs related to Mark II pool dynamic loads. A copy of the attendees, agenda and slides distributed at the meeting are attached. In the morning of the first day (Wednesday) we met with Livermore personnel to discuss the Livermore/DOR program to study fluid structure interactions (FSI) in the Mark I Monticello Safety Relief Valve (SRV) tests.

Wednesday afternoon we met with personnel at Stanford Research Institute to discuss their 1/13 scale Mark II pool swell tests. Thursday we met with representatives of the Mark II owner's group and General Electric to discuss the status of several tasks in their Mark II pool dynamic load program. A summary of the topics discussed in the meetings is provided below.

Summary

Livermore Meeting

Ed McCauley of Livermore summarized the results of the FY 77 Livermore FSI program. Their study of SRV-FSI effects showed a trend of decreasing loads with increasing wall flexibility. The major limitations of their study included the plane section modeling of the containment and the modeling of the source. These assumptions result in an overestimate of the dependence of SRV loads on wall flexibility. Future studies by Livermore are aimed at evaluating the importance of these parameters.



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### Stanford Research Institute Meeting

The purpose of this meeting was to discuss the preliminary results of the Mark II 1/13 scale single vent tests. These SRI tests consisted of air charging tests. Shakedown tests were conducted to determine the affect of water vapor in scale air tests on pool swell phenomenon. The preliminary results for the SRI tests showed differences from similar tests conducted at MIT. The purpose of the meeting was to identify reasons for the differences. Additional SRI testing was discussed to resolve differences in results. While at the SRI facility we toured the pool dynamic test stands. We noted that SRI is conducting EPRI funded tests to investigate steam chugging phenomena. Tests are being conducted at three different scales including single and multivent tests. This test program is a study of the fundamental phenomena of chugging. This program is not a part of the Mark II owner group supporting program.

### Mark II Owner's Group Meeting

The topics discussed in this meeting are listed in the attached meeting agenda. A summary of discussion follows:

#### 1. Monticello SRV - Mark II Fluid Structure Interaction Studies

Dr. H. Tang of General Electric discussed the results of studies at GE to determine the effect of containment wall flexibility on the measured SRV loads in the Monticello tests. GE performed calculations similar to those performed by Livermore. Their plane strain calculations utilized similar assumptions of containment rigidity and load source to those performed by Livermore. Under these conditions they observed the same trend of reducing load with increasing wall flexibility as observed in the Livermore studies. However, the GE studies were extended to include axisymmetric calculations, 3D modeling of a torus segment and a multiple pulse source. Results of these studies show that wall flexibility amplifies the loads. This conclusion contradicts the Livermore 2D study. In addition they conducted analytical-experimental comparisons using their model and the Monticello data. The use of the more realistic assumptions in the analytical model substantiated the Mark II owner's claim that the Monticello benchmark is valid. The Monticello FSI study is now considered complete by the Mark II owner's group. Documentation will be provided to the NRC by the end of May 1978.



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2. 4T FSI

In our March meeting with the Mark II owner's group we discussed the desirability of formulating a conservative chugging impulse load to resolve 4 T FSI questions. Dr. Healzer of General Electric discussed their plan for this task. They should complete this study by early June 1978. A status report will be provided at the next Mark II owner's meeting.

This meeting is tentatively scheduled for mid May 1978. In addition we requested that Dr. Healzer provide us, within the next few weeks, an outline of the objective of this task.

3. SRV Pool Temperature Limits

T. Su of NRC provided an NRC status report on the issue of SRV pool temperature limits. He stated that based on our current review of the small scale tests there is inadequate supporting data to justify the current pool temperature limits for rams-head relief valve devices. As a result of our review we are preparing an NRC position requiring the use of quencher type devices in Mark II plants since these devices have higher pool temperature limits.

4. DFFR Lead Plant SRV Loads

T. Su of NRC provided a status report on the NRC review of the Mark II ramshead model. He highlighted several deficiencies in the current model. We also discussed the use of the ramshead model for those lead plants which have committed to a switch from a ramshead to a quencher device. H. Brinkman representing the Mark II owner's group stated that their plans are to use the current ramshead model to predict SRV loads for plants with quencher devices. Test programs are being developed to show that the use of these ramshead loads for quencher devices is a conservative approach. Current plans call for completion of the confirmatory tests prior to operation of the first Mark II plant.

5. PSTF Impact Loads

G. Maise of BNL outlined the results of the NRC evaluation of Mark II Pool Dynamic - impact loads. This study concluded that the current DFFR impact load specification is inadequate in that





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the impulse load specification does not include a conservative pulse duration. In addition no consideration has been given to the affect of target geometry on the impact load. The Mark II owner's stated that they had not had sufficient time to review the basis for our conclusions nor the impact of this potential load modification on equipment in specific Mark II plants. Their preliminary review of the BNL study has not uncovered any deficiencies in the BNL study. However, conservatisms in the current impact load specification could be balanced against these recently identified non conservatisms. At the next Mark II owner's meeting in mid-May the Mark II owners will provide us their evaluation of the BNL study and a review of the impact of this load modification on specific Mark II plants.

*I. Peltier*

I. Peltier, Project Manager  
Light Water Reactors Branch No. 1  
Division of Project Management

Enclosures:

1. Agenda
2. Attendance List
3. Viewgraph Material

cc: See Following Pages



APR 25 1978

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Hicksville, New York 11801

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Long Island Lighting Company  
250 Old Country Road  
Mineola, New York 11501

Edward J. Walsh, Esq.  
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Long Island Lighting Company  
250 Old Country Road  
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Mr. Thomas Burke  
Project Manager  
Shoreham Nuclear Power Station  
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Wading River, New York 11792

Director, Technical Development Programs  
State of New York Energy Office  
Agency Building 2  
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Albany, New York 12223

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380 North Broadway  
Jericho, New York 11753

Irving Like, Esq.  
Reilly, Like and Schnieder  
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MUB Technical Associates  
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Palo Alto, California 94306



APR 25 1978

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Deputy Attorney General  
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Special Assistant Attorney General  
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House of Representatives  
Congress of the United States  
Washington, D. C. 20515

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Joseph A. Smyth  
Assistant County Solicitor  
County of Montgomery  
Courthouse  
Norristown, Pennsylvania 19404



APR 25 1978

The Cincinnati Gas & Electric Company  
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Board & Chief Executive Officer  
The Dayton Power & Light Company  
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Dayton, Ohio 45401

Mr. J. Robert Newlin, Counsel  
The Dayton Power & Light Company  
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Dayton, Ohio 45401

Mr. Stephen Schumacher  
Miami Valley Power Project  
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Ms. Augusta Price  
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Manager, Licensing & Environmental Affairs  
The Cincinnati Gas & Electric Company  
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Mr. J. P. Fenstermaker  
Senior Vice President - Operations  
Columbus & Southern Ohio Electric Co.  
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Columbus, Ohio 43215

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Cincinnati City Solicitor  
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Cincinnati, Ohio 45202

Troy B. Conner, Esq.  
Conner, Moore & Cober  
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Washington, D. C. 20006





APR 25 1978

Northern Indiana Public Service Company  
ATTN: Mr. H. P. Lyle, Vice President  
Electric Production & Engineering  
5265 Holman Ave.  
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Martin Tower  
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Special Assistant Attorney General  
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APR 25 1978

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Chicago, Illinois 60670



APR 25 1978

Pennsylvania Power and Light Company  
ATTN: Mr. Norman W. Curtis  
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Pennsylvania Power & Light Company  
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Allentown, Pennsylvania 18101

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Manager Susquehanna  
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Pennsylvania Power & Light Company  
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Allentown, Pennsylvania 18101

Edward M. Nagel, Esquire  
General Counsel and Secretary  
Pennsylvania Power & Light Company  
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Allentown, Pennsylvania 18101



Washington Public Power Supply System  
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Managing Director  
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Richland Washington 99352

APR 25 1978

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Richard Q. Quigley, Esq.  
Washington Public Power Supply System  
P. O. Box 968  
Richland, Washington 99352





Niagra Mohawk Power Corporation  
ATTN: Mr. Jerald K. Rhode  
Vice President Engineering  
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APR 25 1978

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Washington, D. C. 20036

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Roisman, Kessler & Cashdan  
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Washington, D. C. 20036

Mr. Richard Goldsmith  
Syracuse University  
College of Law  
E. I. White Hall Campus  
Syracuse, New York 13210

T. K. DeBoer, Director  
Technological Development Programs  
New York State Energy Office  
Swan Street Building  
Core 1 - 2nd Floor  
Empire State Plaza  
Albany, New York 12223



Mark II - NRC Meeting  
Proposed Agenda

APR 25 1978

Livermore - April 5, 1978

- I. Livermore Fluid Structure Interaction Program
  - A. SRV Study
  - B. Chugging Study
- II. Submerged Structure Drag Loads
  - A. NRC Questions
  - B. DFFR Loads for Lead Plants

San Jose - April 6, 1978

- I. Monticello SRV - Mark II Fluid Structure Interaction Studies
- II. Pool Temperature Limits NRC Review Status
- III. DFFR Lead Plant SRV Loads
  - A. Philosophy
  - B. Ramshead Model
- IV. 4T FSI - Mark II Program to Devise Chugging Impulse Load
- V. PSTF Impact Load
  - A. BNL Study
  - B. Plant Target Characteristics



APR 25 1978

Lawrence Livermore Lab  
4-5-78  
Meeting Attendance

NRC

K. S. Herring  
Abdel Hafiz  
T. M. Su  
Chris Grimes  
C. Anderson

S&L

C. N. Krishnawamy

NSC

R. E. Koppe

MIT

Ain A. Sonin  
Peter Huber

BNL

Chee Tung  
C. Economus  
R. Scanlan  
C. Bienkowski  
George Maise

GE

H. T. Tang  
V. M. Healter  
R. J. Muzzy  
L. H. Srauenholz  
J. E. Rogers  
R. F. McClelland  
L. J. Sobon

Nutech-MKI Owners

N. W. Edwards

LLL

G. S. Holman  
S. C. Lu  
R. W. Martin  
W. E. Mason  
Frank J. Tokarz

Bechtel

Moe Michail

Pa. Powers Light Company

Howard W. Holland

SRI

George Abrahamsen

EPRI

John Carey

EG&G

C. Y. Liaw



APR 25 1978

Attendance List

NRC/Mark II Owners Group  
April 6, 1978  
Holiday Inn - San Jose, CA

General Electric

A. R. Smith  
H. T. Tang  
J. R. Martin  
L. H. Frauenholz  
R. J. Muzzy  
L. J. Sobon  
R. E. McClelland

NRC

C. Anderson  
I. A. Peltier  
T. M. Su  
C. I. Grimes  
A. Hafiz

MIT

P. W. Huber  
A. A. Sonin

BNL

C. Tung  
C. Economos  
George Maise  
R. H. Scanian  
R. Bienkowski

CGE

H. C. Brinkmann

Pa. Power & Light Company

Howard W. Holland

NSC

R. E. Koppe

Bechtel

Jack Weyandt  
H. M. Schoenhoff  
D. M. O'Connor

Sargent & Lundy

C. N. Krishna Swamy

LLL

E. W. McCauley  
G. S. Holman





APR 25 1978

## MONTICELLO SRV FSI

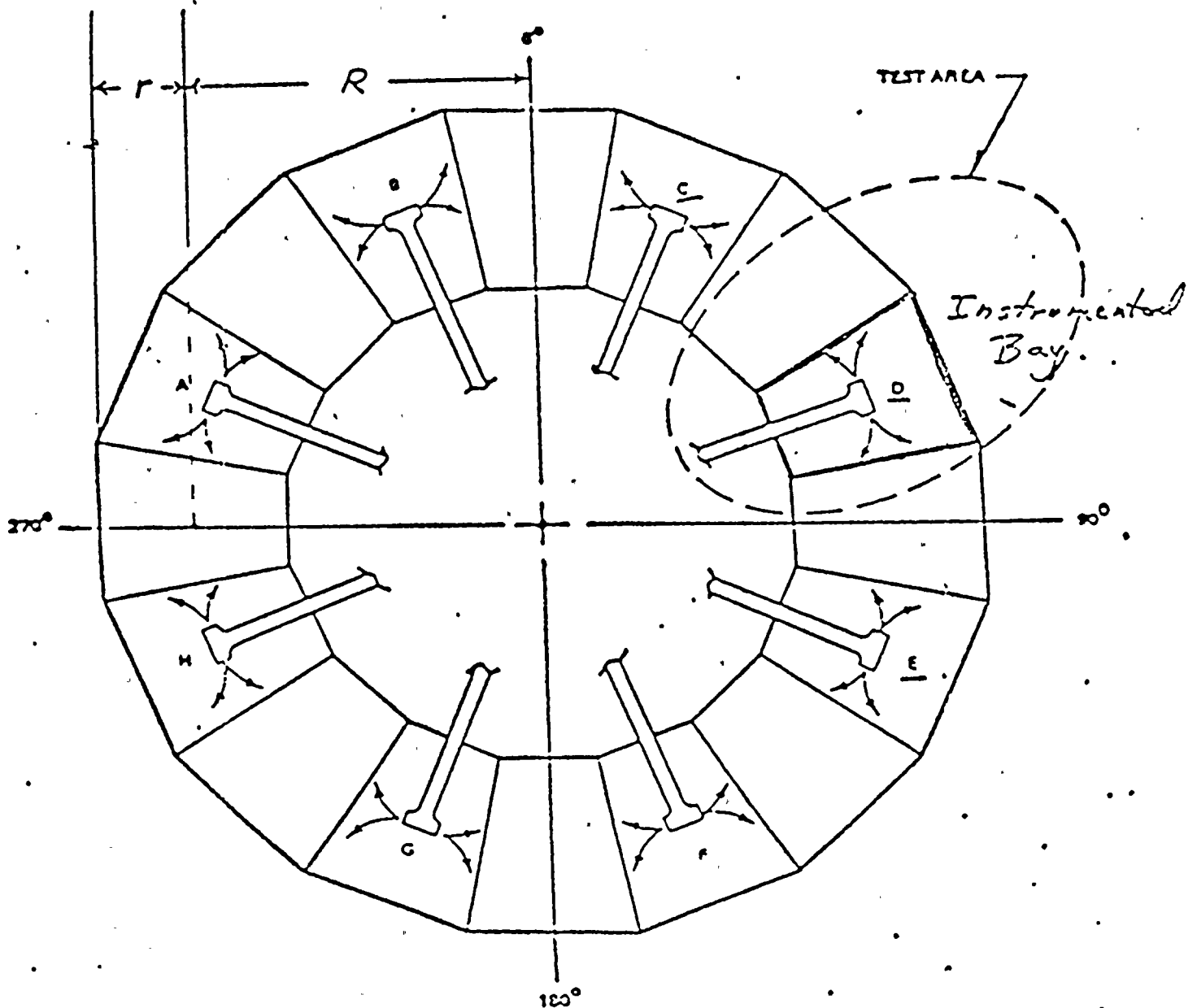
- BACKGROUND AND GENERAL  
MODEL DESCRIPTION
- COMPARISON TO LLL STUDY
- EXTENSIONS OF LLL STUDY
  - AXISYMMETRIC
  - 3-D
- ANALYTICAL-EXPERIMENTAL  
COMPARISONS
  - DATA
  - MULTIPLE PULSE RESPONSE
- SUMMARY

HTT

4-6-78



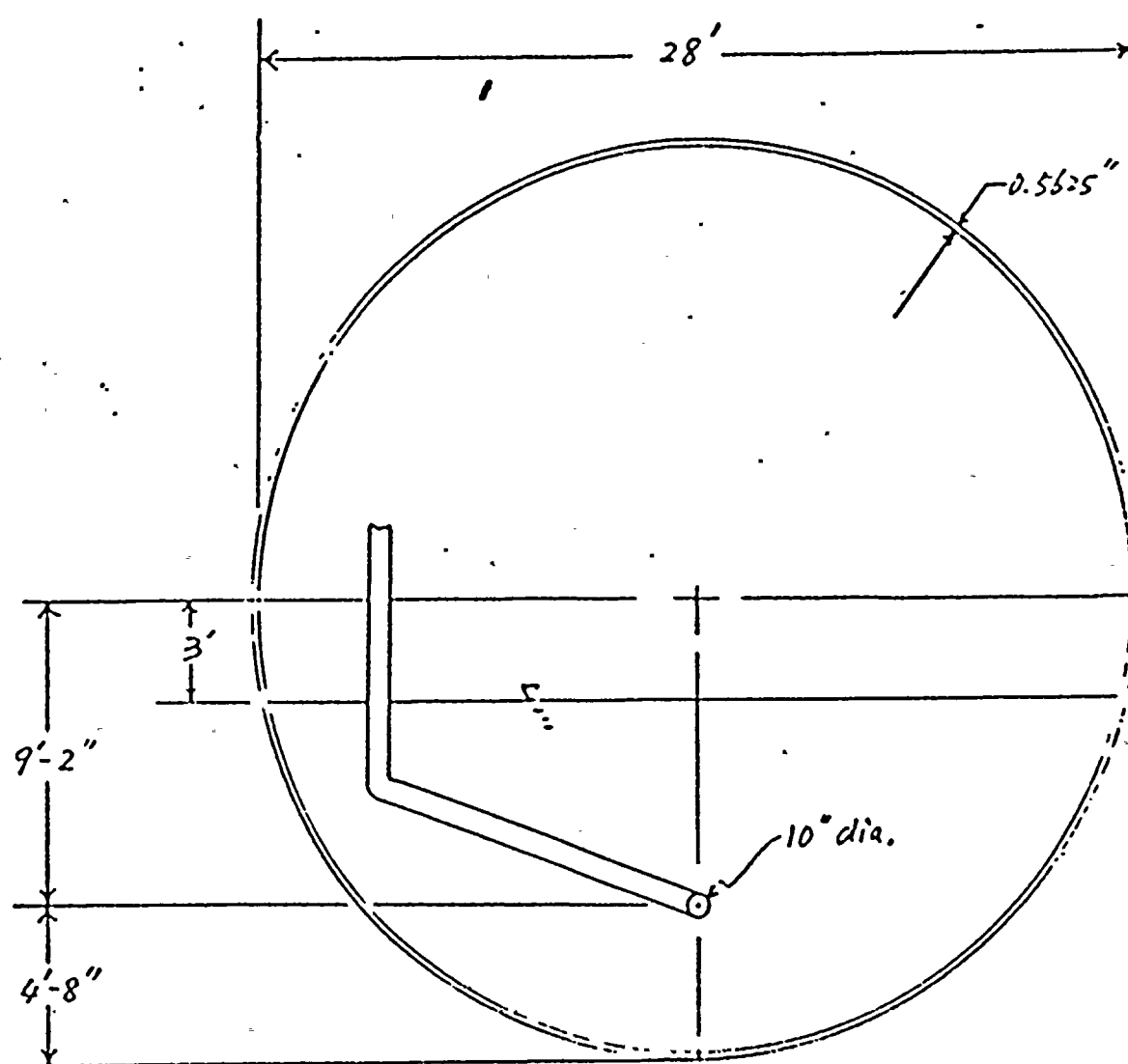
$R$ , TORUS RADIUS (MAJOR RADIUS) = 49' .  
 $r$ , TORUS CROSS-SECTION RADIUS  
 (MINOR RADIUS) = 14'



TOP VIEW OF MONTICELLO TORUS

HTT  
 4-1-77



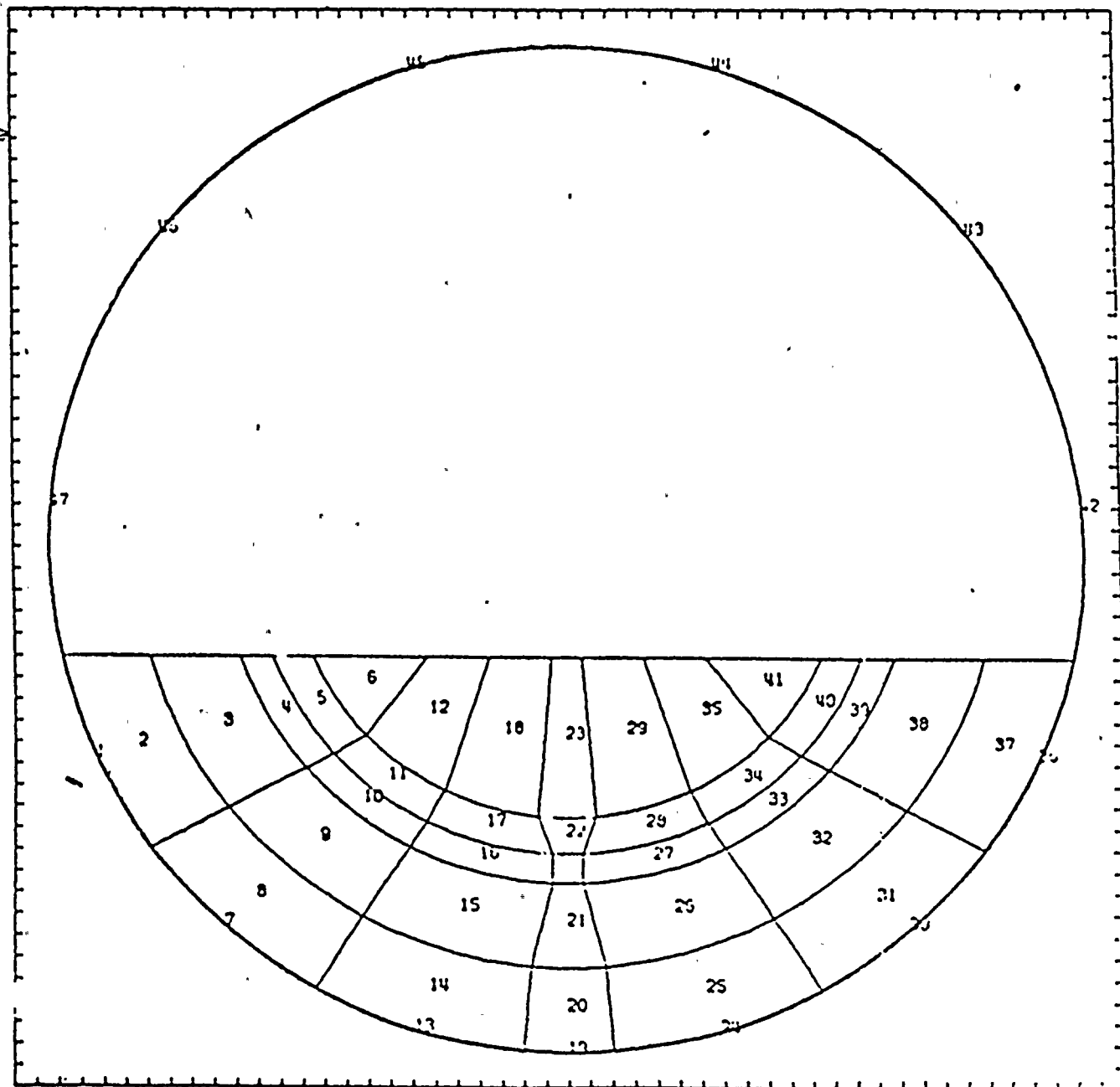


CROSS-SECTIONAL DIMENSIONS OF  
MONTICELLO TORUS

H/TT



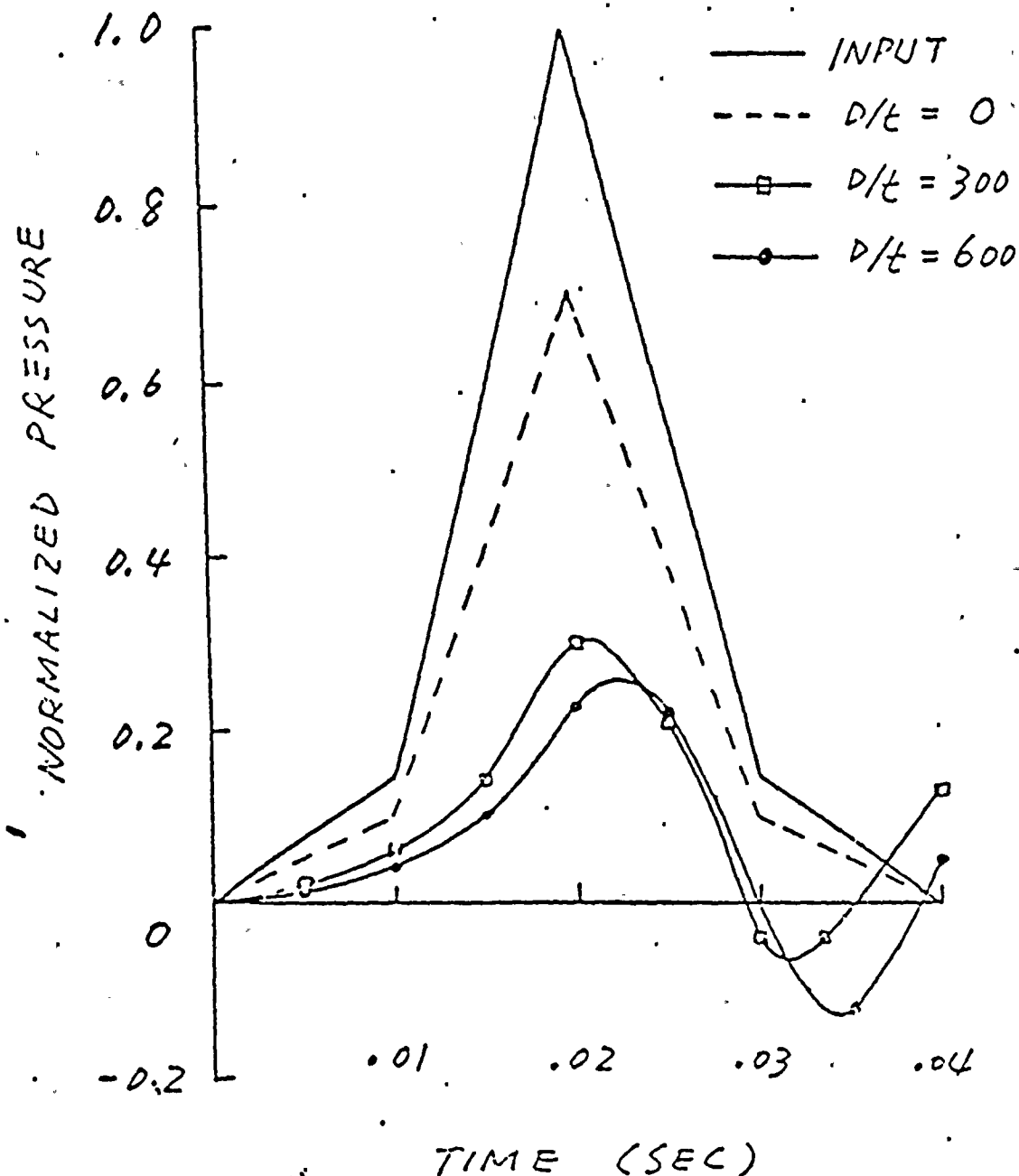
ELEMENTS



FINITE ELEMENT MESH OF THE  
TORUS CROSS-SECTION



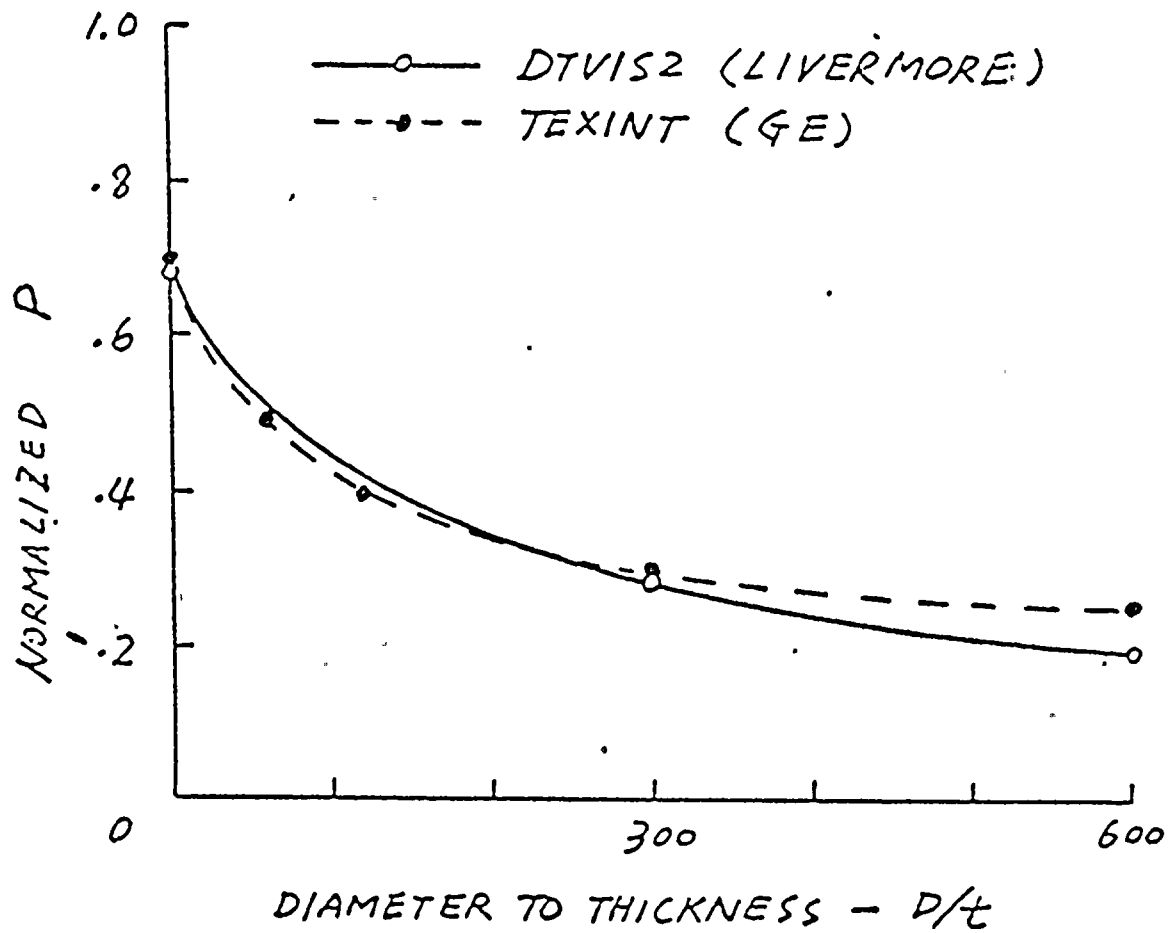




PRESSURE HISTORIES FOR  
VARIOUS  $D/t$  - PLANE STRAIN



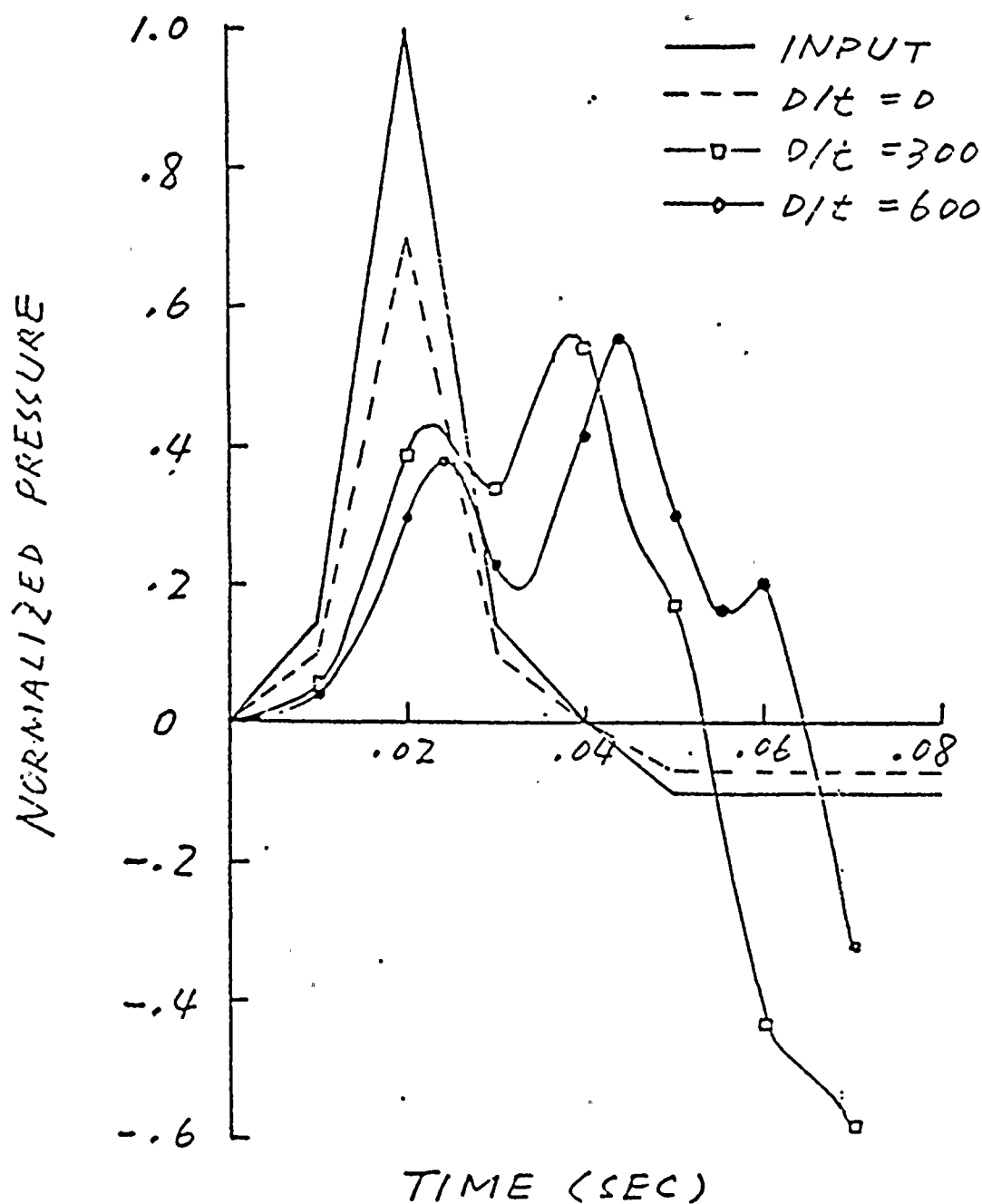
PLANE STRAIN



NORMALIZED PEAK BOTTOM  
PRESSURE VARIATIONS VS  $D/t$ .  
— INITIAL PULSE RESPONSE



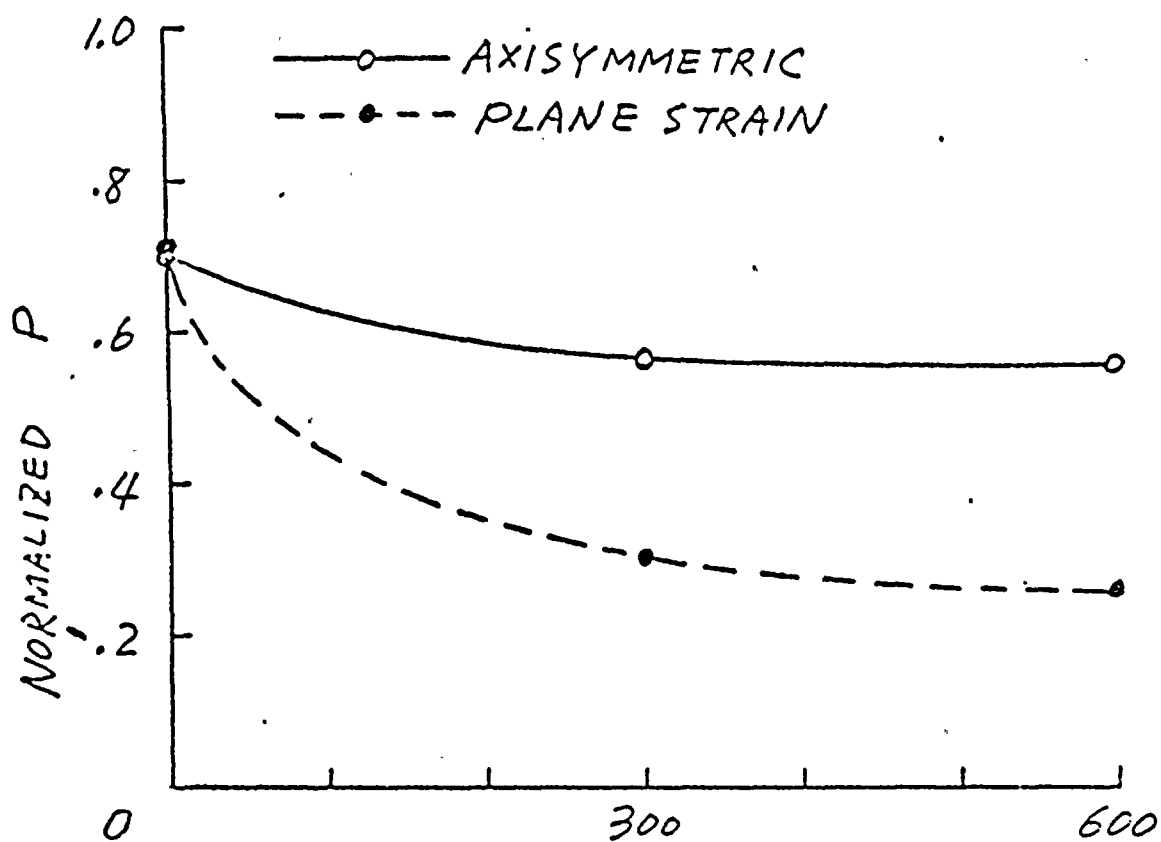
+12 psi peak



PRESSURE HISTORIES FOR  
FOR VARIOUS D/t - AXISYMMETRIC

HTT  
4-6-71



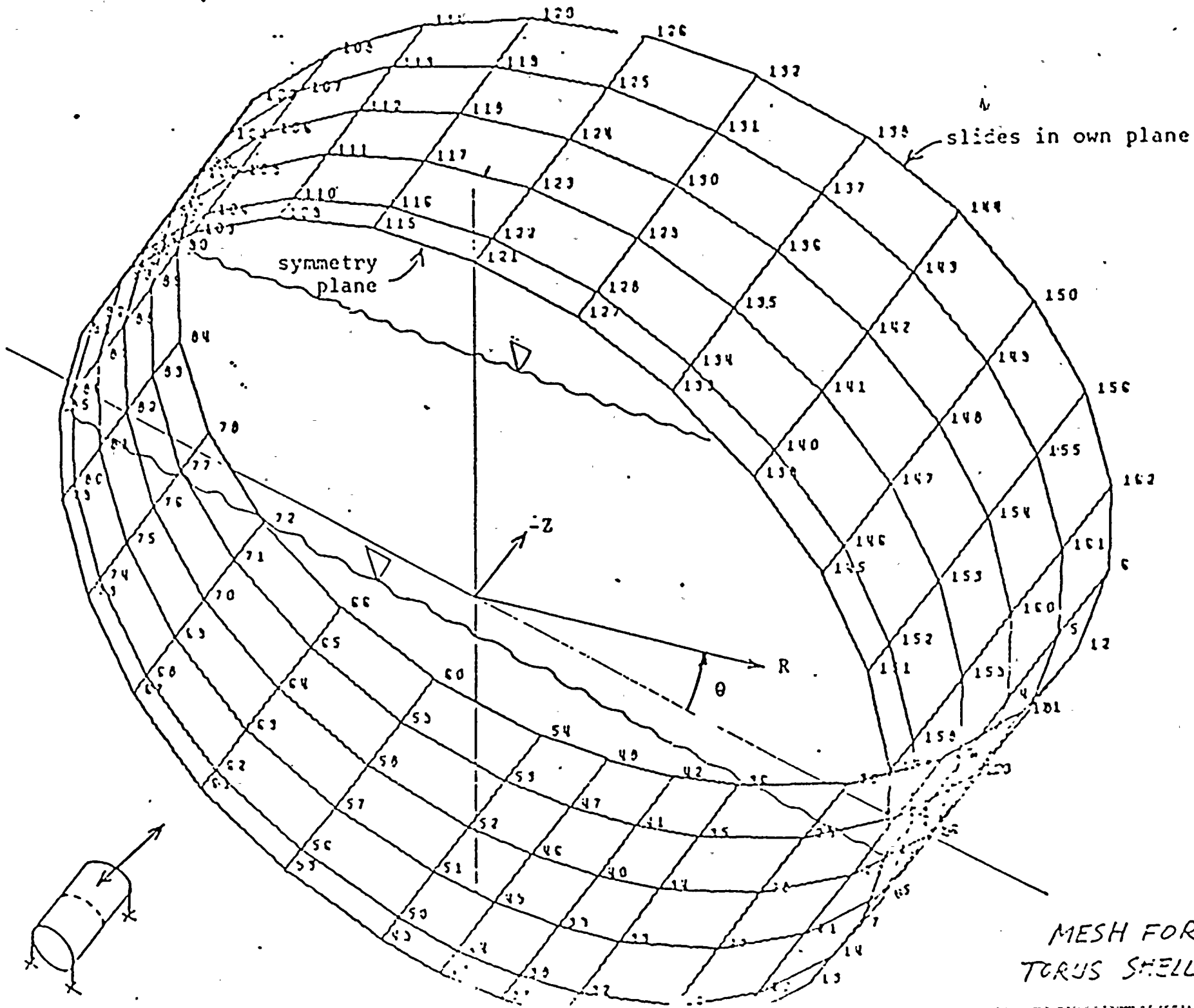


DIAMETER TO THICKNESS -  $D/t$

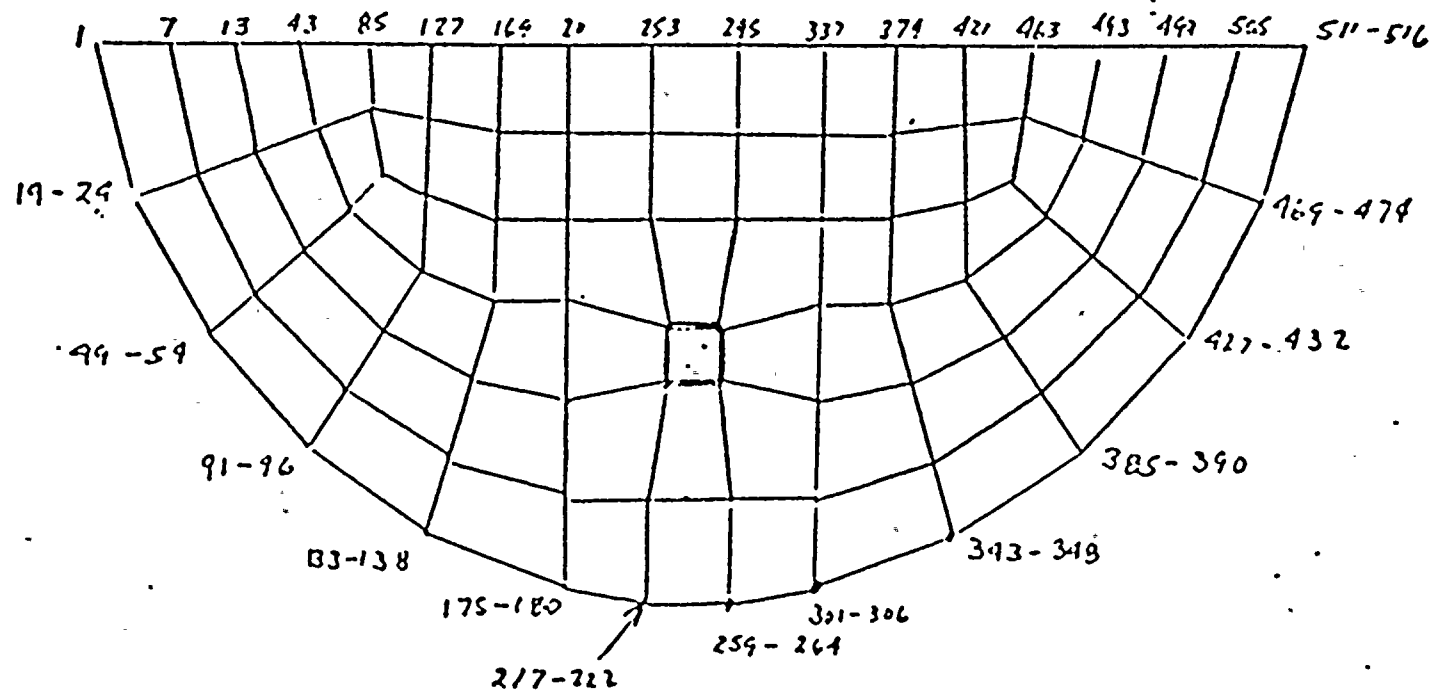
NORMALIZED PEAK BOTTOM  
PRESSURE VARIATIONS VS  $D/t$   
- INITIAL PULSE RESPONSE







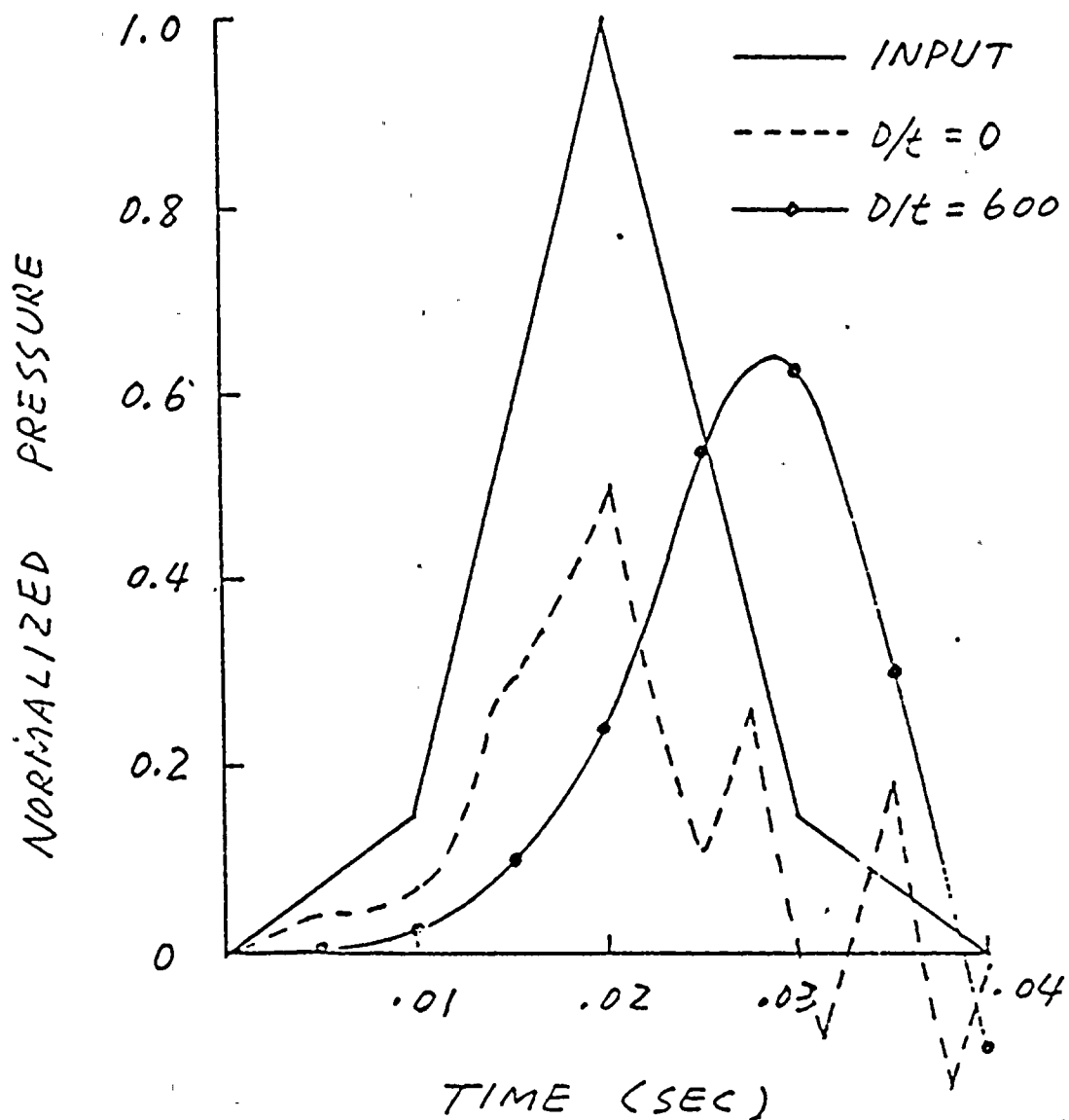




MESH FOR THE FLUID

HTT  
11-1-77

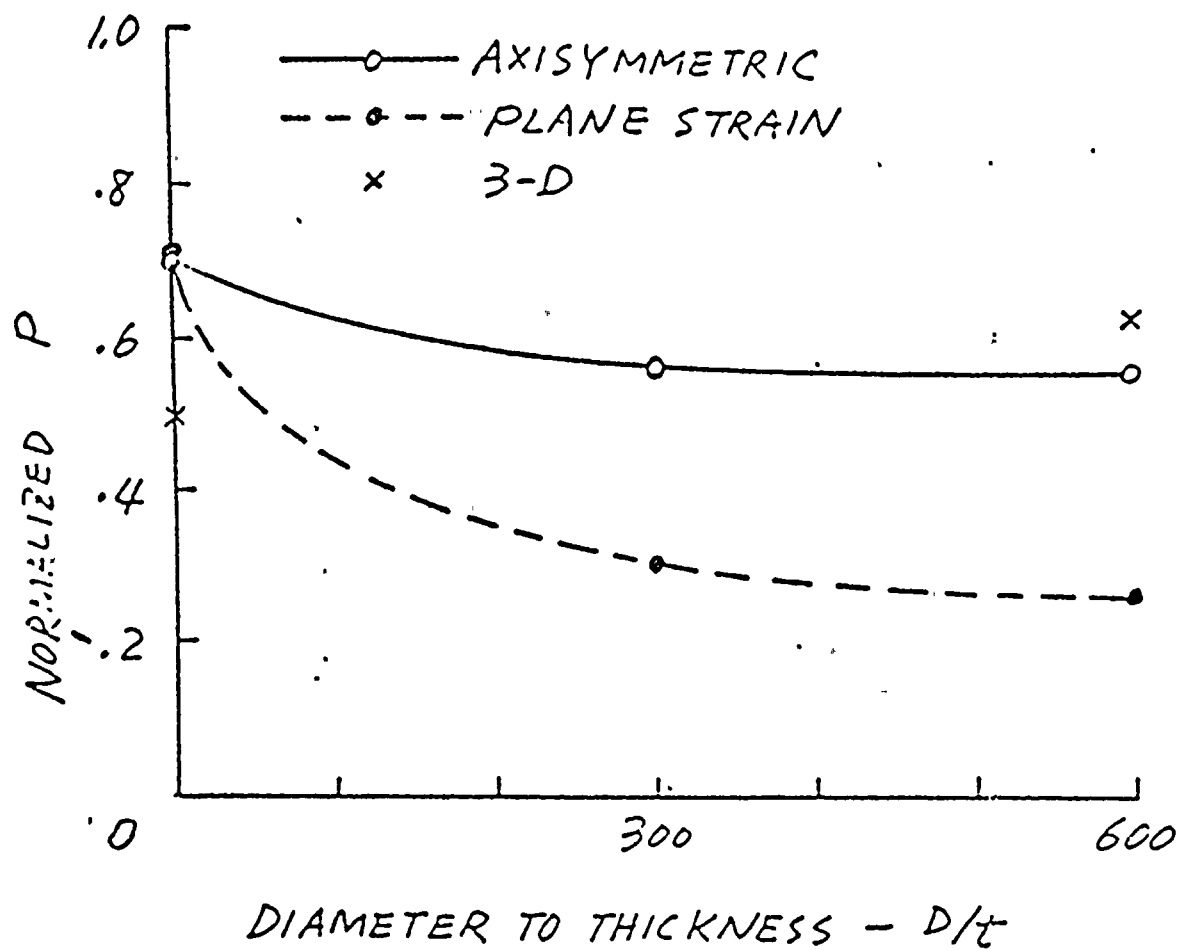




PRESSURE HISTORY FOR  
3-D MODEL UNDER FIRST PULSE

1477  
0.172

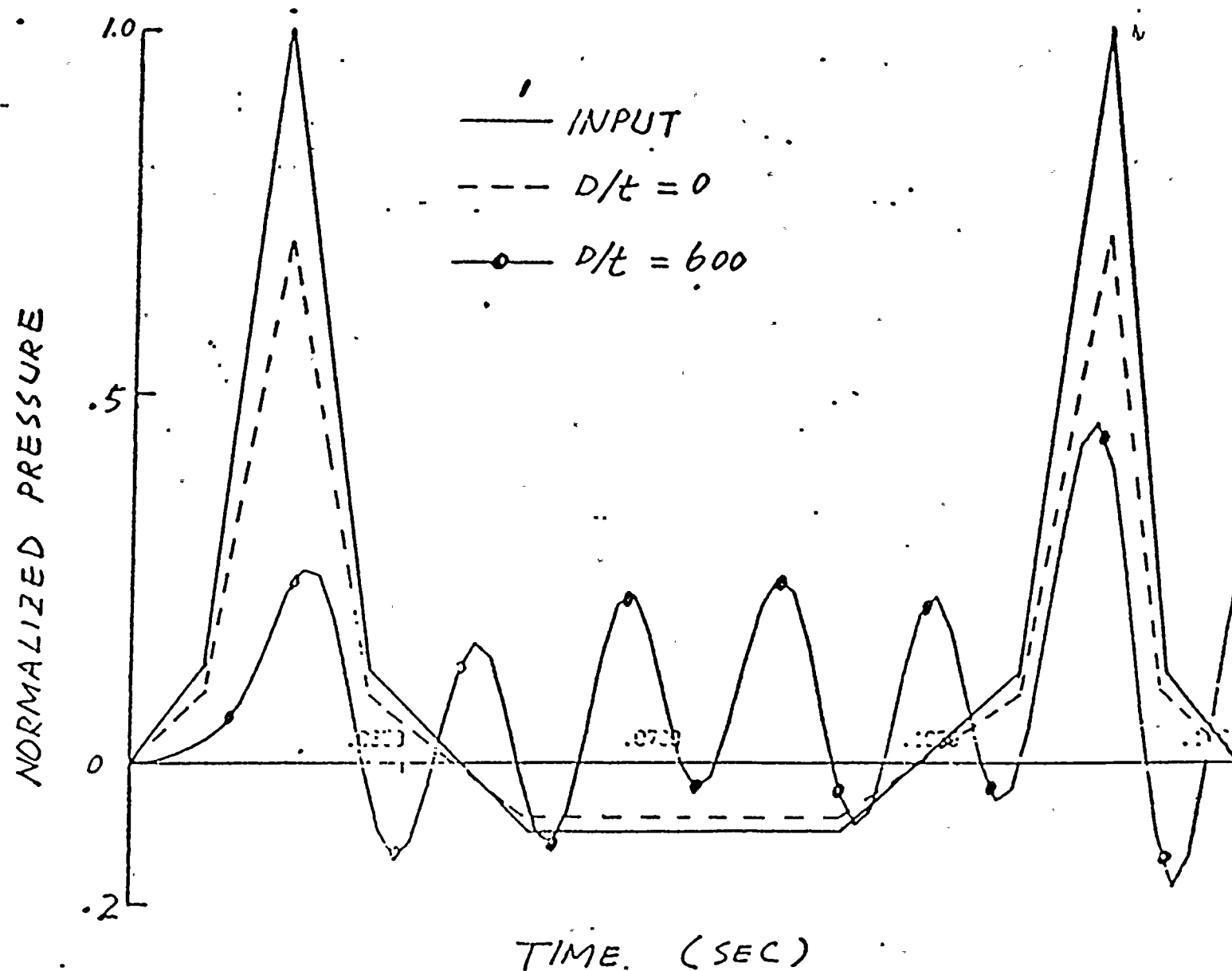




NORMALIZED PEAK BOTTOM  
PRESSURE VARIATIONS VS  $D/t$   
- INITIAL PULSE RESPONSE

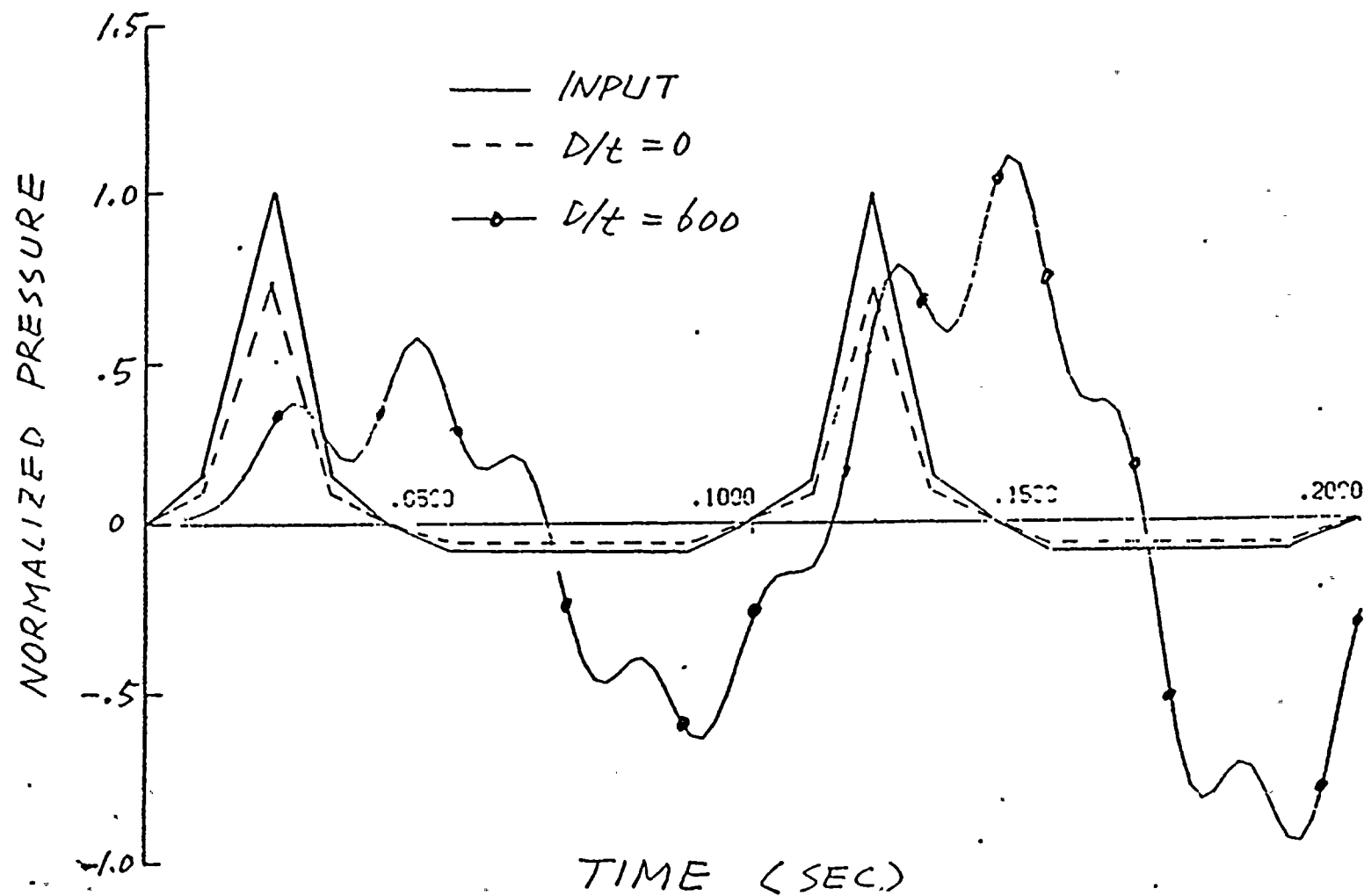






PRESSURE HISTORY AT BOTTOM CENTER  
FOR PLAN. STRAIN CASE





PRESSURE HISTORY AT BOTTOM CENTER  
FOR AXISYMMETRIC CASE

HTT  
U-1-7K



## SUMMARY

- COMPARISON TO LLL RESULTS IS GOOD. HOWEVER, NOT QUANTITATIVELY REPRESENTATIVE
- MORE REALISTIC EXTENSIONS SHOW DECREASING / CONSERVATIVE EFFECT OF FSI
- ANALYTICAL - EXPERIMENTAL COMPARISONS SHOW
  - TIME PHASE BEHAVIOR SIMILAR TO RIGID CASE
  - AMPLITUDE ADJUSTMENT BETTER PREDICTED IN FLEXIBLE MULTI-PULSE EVALUATION

(TO CONT.)



SUMMARY (CONTD.) .

- ALL THE EXTENDED ANALYSES  
AND COMPARISONS TO DATA  
INDICATE THAT THE MONTICELLO  
BENCHMARK IS VALID .

HTT  
4-6-73

