



435 Sixth Avenue
Pittsburgh, Pa.
15219

(412) 456-6000

DUQUESNE LIGHT COMPANY
Beaver Valley Power Station
Post Office Box 4
Shippingport, PA 15077

October 25, 1979
BVPS:JJ7:621

Feedwater Break Analysis

Mr. Dave Wigginton
Licensing Project Manager
Beaver Valley Unit No. 1
United States Nuclear Regulatory Commission
Division of Operating Reactors
Washington, DC 20555

Dear Dave,

Enclosed is a copy of the information that I have received from
Stone & Webster.

Please be advised that in the course of the Stone & Webster Quality
Assurance Review of these results, a mathematic error was discovered in
calculational model. The effect of this error was to incorrectly assume
that a portion of the FW flow to the intact SGs was spilled to the
containment.

The correcting of this error will yield somewhat longer times to arrive
at the peak containment pressure. I hope to submit the Quality Assurance
approved results for docketing in early November.

Sincerely,

J. J. Carey
Technical Assistant - Nuclear

JJC:krq

Enclosure

1229 107

Acc 11

7910300 350

STONE & WEBSTER ENGINEERING CORPORATION
P. O. BOX 2325, BOSTON, MASSACHUSETTS 02107

DATE	10/16/79
J O NO	13352.03
P O NO	
LTR NO	DLS-15105
REF	

VIA

TO
Mr. H.A. Van Wassen
Project Manager
Duquesne Light Company
435 Sixth Avenue
Pittsburgh, PA 15219

DEAR SIR:

THE FOLLOWING ARE ☒ ATTACHED ☐ SENT SEPARATELY

COPIES	PRINTS	REPRODUCIBLES	MICROFILM APERTURE CARDS
EACH OF			
<input type="checkbox"/> DRAWINGS	<input type="checkbox"/> SPECIFICATIONS		
<input checked="" type="checkbox"/> DOCUMENTS	<input type="checkbox"/> NOTES OF CONFERENCE		

STATUS		PLEASE NOTE	SENT FOR YOUR	
<input type="checkbox"/> FINAL	<input type="checkbox"/> APPROVED	<input type="checkbox"/> REVISIONS	<input type="checkbox"/> OMISSIONS	<input type="checkbox"/> APPROVAL <input type="checkbox"/> COMMENT
<input checked="" type="checkbox"/> PRELIMINARY	<input type="checkbox"/> APPROVED AS REVISED AS DEFINED IN SPECIFICATION	<input type="checkbox"/> ADDITIONS	<input type="checkbox"/> CORRECTIONS	<input checked="" type="checkbox"/> USE <input type="checkbox"/> INFORMATION
<input type="checkbox"/> NO COMMENT	<input type="checkbox"/> UNACCEPTABLE	<input type="checkbox"/> COMMENTS	<input type="checkbox"/>	<input type="checkbox"/> FILES <input type="checkbox"/> CONCURRENCE
<input type="checkbox"/> SUGGESTIONS AS NOTED	<input type="checkbox"/>			

YOUR ATTENTION IS DIRECTED TO THE FOLLOWING:

RELEASED FOR: <input type="checkbox"/> FABRICATION <input type="checkbox"/> PURCHASE OF NECESSARY MATERIALS	
<input type="checkbox"/> PLEASE REVISE AND SUBMIT	PRINTS REPRODUCIBLES MICROFILM APERTURE CARDS
<input type="checkbox"/> PLEASE SUBMIT	PRINTS REPRODUCIBLES MICROFILM APERTURE CARDS OF <input type="checkbox"/> DOCUMENTS <input type="checkbox"/> DRAWINGS <input type="checkbox"/> SHOP DETAIL
<input type="checkbox"/> PLEASE RETURN ONE COPY EACH OF THIS MATERIAL BEARING YOUR APPROVAL OR COMMENTS	
<input type="checkbox"/> PLEASE ACKNOWLEDGE RECEIPT OF THIS MATERIAL BY SIGNING AND RETURNING THE ENCLOSED COPY OF THIS FORM	
<input type="checkbox"/> WE TRUST THAT THESE NOTES ARE IN ACCORDANCE WITH YOUR UNDERSTANDING. IF NOT, PLEASE ADVISE US.	

IMPORTANT SHOULD ANY REVISION TO DOCUMENTS OR DRAWINGS RETURNED HERewith INVOLVE A PRICE INCREASE, THE SUPPLIER MUST NOTIFY STONE & WEBSTER PURCHASING DEPARTMENT WITHIN TEN (10) DAYS EVEN THOUGH A DEFINITE ESTIMATE CANNOT BE GIVEN AT THE TIME. OTHERWISE, THE PURCHASER WILL CONSIDER THE REVISIONS MADE WITHOUT COST.

BEAVER VALLEY POWER STATION - UNIT NO. 1
DUQUESNE LIGHT COMPANY
MAIN STEAM LINE BREAK ANALYSIS - J.O.NO. 13352.03

Attached please find the preliminary results of the BV-1 Main Steam Line Break Analysis. We understand, per your Mr. Jack Carey, that you will transmit this information to the NRC as preliminary information not for docketing.
A final analysis comparing different units has been requested by the NRC; and will also be transmitted to you to be forwarded to the NRC. If you have any questions please call.

Very truly yours,
R.M. Stark
R.M. Stark
Project Engineer

POOR ORIGINAL

RECEIVED

Copy to:
G Moore (enc)
C Dunn (enc)
J Carey (enc)✓

OCT 17 1979

Stone & Webster
Engineering Corporation
B. V. P. S. Unit 2

1229 108

NOTES OF TELEPHONE CONVERSATION

Date of Call: October 1, 1979

J.O.No. 13352.03

Subject: BV-1 MAIN STEAM BREAK ANALYSIS

Participants:

Duquesne Light Company -

Gil Moore
Clifford Dunn
Jack Carey

Nuclear Regulatory Commission -

David Wiggenton
Janice Kerrigan
Elinor Adensam
David Shum

Stone & Webster Engineering Corp. -

W. C. Drotleff
E. A. Warman
R. M. Stark
C. E. Ader
F. A. Elia, Jr.
E. A. Thomas
B. F. Jones

As requested by the NRC at their meeting, September 21, 1979, DLC and S&W reported the status of the BV-1 main steam line break (in the containment) analysis.

Assumptions used in the analysis and the preliminary results of the BV-1 analysis are attached.

Calculated auxiliary feedwater pump run-out flow for the broken loop is approximately 1600 gpm, for the two intact loops is approximately 200 gpm each, 900 gpm coming from the turbine driven pump and 550 gpm coming from each motor driven pump. A containment backpressure of 20 psig was included in the broken loop system resistance. In response to the NRC's question regarding the change in auxiliary feedwater pump-runout flow, S&W stated that 2800 gpm was based on pump characteristics, whereas the 2000 gpm was based on a more detailed analysis including calculated system resistance.

The NRC asked for a telecopy of the attached assumptions and tables which are to be marked preliminary information, not for docketing.

In addition, the NRC asked for a response to the following questions:

1. What main feedwater isolation valve closing time was used in the analysis?
2. What is the maximum main steam line volume between the broken steam generator and the nearest main steam line stop valve?
3. What is the maximum main steam line volume between the damaged steam generator stop valve and the other steam generator stop valves?
4. What is the total of 2 and 3 above?

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5. What is the maximum feedwater volume between the main feedwater isolation valve and the steam generator?
6. Provide Westinghouse furnished mass/energy release for the 1.4 sq ft break for all power levels available.

A copy of S&W's responses to the above questions is attached. The responses were sent to NRC, attention Elinor Adensam, 301-492-7617, telecopier number 7371, on October 3, 1979.

1229 110

TELECOPIED

TIME 11:45
DATE 12-1-79
TO Bill [unclear]

Assumptions:

1. Main steam non-return valve functions instantaneously to isolate the faulted steam generator break from reverse main steam flow.
2. Blowdown rate of the faulted steam generator is calculated by S&W/W, feedwater flow control valve goes to full open, zero pressure drop through the steam generator for 30% and 103% cases.
3. The two intact steam generators stay pressurized.
4. Steam generators are isolated by controls sensing the break.
5. Auxiliary feedwater flow is available within ten seconds, with run-out flow going preferentially to the faulted steam generator per system hydraulics.
6. Heat transfer coefficient is constant, heat transfer vs. time per computer code. (~ 1200 BTU/lb)
7. Containment backpressure is 20 psig for all cases.
8. Single active failure is one CIB resulting in minimum safeguards; i.e., failure of one-half of the containment sprays.
9. No operator action is assumed.
10. All auxiliary pumps operational.

Footnotes

- (1). Initial Conditions - 10.4 PSIA, Service Water T = 86°F, Tc = 105° (SAT)
- (2). Initial Conditions - 11.6 PSIA, Service Water T = 32°F, Tc = 105° (SAT)

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(PRELIMINARY INFORMATION -
NOT FOR DOCKETING)

PRELIMINARY

Summary of Results of B.V. 1 Cont. Pressure Analyses

S.G. Blowdown Data	Steamline Break (ft ²)	Reactor Power (%)	Initial Peak Pressure (PSIG)	Time of Initial Peak (sec.)	Pressure @ 1800 sec (PSIG)
Westinghouse	1.4	102 (1)	33.0	305	38.0
		30 (1)	39.1	650	42.4
		0 (1)	--	--	44.1
S&W ~ LOCTIC	4.9	102 (1)	34.3	56	32.8
		30 (1)	41.8	65	36.5
		0 (1)	42.2	63	36.7
		0 (2)	44.1	63	31.2

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(PRELIMINARY INFORMATION -
NOT FOR DOCKETING)

STONE & WEBSTER

Answers to NRC Questions
on Preliminary Beaver Valley 1 Containment Pressure Analysis

1. What main feedwater isolation valve closing time was used in the analysis?

Answer: 7.5 sec.

2. What is the maximum main steam line volume between the broken steam generator and the nearest main steam line stop valve?

Answer: 985 ft³(Loop A)

3. What is the maximum main steam line volume between the damaged steam generator stop valve and the other steam generator stop valves?

Answer: 8,000 ft³(0 used in the analysis)

4. What is the total of 2 and 3 above?

Answer: 8,985 ft³(985 used in the analysis)

5. What is the maximum feedwater volume between the main feedwater isolation valve and the steam generator?

Answer: 283 ft³

6. Provide the Westinghouse furnished mass and energy release data for the 1.4 sq. ft. break for all power levels available.

Response:

Westinghouse data as inputted to our analysis are given in the attached sheets.

POOR ORIGINAL

TELECOPY TO NRC (10/3/79)

ATTENTION: ELINOR G. ADENSAM

301-492-7617 x 7371

1229 113

TOTAL FLOW

REVERSE FLOW

FORWARD FLOW

TIME (SEC)	FLOW (LHM/SEC)	ENERGY (BTU/SEC)	TIME (SEC)	FLOW (LHM/SEC)	ENERGY (BTU/SEC)	TIME (SEC)	FLOW (LHM/SEC)	ENERGY (BTU/SEC)
0.0	0.2691E+04	0.3217E+07	0.0	0.4997E+04	0.5974E+07	0.0	0.7609E+04	0.9191E+07
0.0	0.2691E+04	0.3217E+07	0.0	0.4997E+04	0.5974E+07	0.0	0.7609E+04	0.9191E+07
0.0100	0.2691E+04	0.3217E+07	0.0100	0.5303E+04	0.6435E+07	0.0100	0.8073E+04	0.9650E+07
1.0000	0.2691E+04	0.3217E+07	1.0000	0.5000E+04	0.6096E+07	1.0000	0.7632E+04	0.9145E+07
2.0000	0.2691E+04	0.2770E+07	2.0000	0.4615E+04	0.5539E+07	2.0000	0.6922E+04	0.8308E+07
3.0000	0.2691E+04	0.2544E+07	3.0000	0.4234E+04	0.5000E+07	3.0000	0.6351E+04	0.7632E+07
4.0000	0.2691E+04	0.2353E+07	4.0000	0.3921E+04	0.4716E+07	4.0000	0.5821E+04	0.7074E+07
5.0000	0.2691E+04	0.2202E+07	5.0000	0.3661E+04	0.4450E+07	5.0000	0.5491E+04	0.6607E+07
6.0000	0.2691E+04	0.2077E+07	6.0000	0.3454E+04	0.4150E+07	6.0000	0.5100E+04	0.6236E+07
7.0000	0.2691E+04	0.1974E+07	7.0000	0.3209E+04	0.3940E+07	7.0000	0.4930E+04	0.5936E+07
8.0000	0.2691E+04	0.1863E+07	8.0000	0.3147E+04	0.3791E+07	8.0000	0.4715E+04	0.5679E+07
8.7256	0.2691E+04	0.1832E+07	8.7256	0.0	0.0	8.7256	0.1521E+04	0.1832E+07
9.0000	0.2691E+04	0.1811E+07	9.0000	0.0	0.0	9.0000	0.1503E+04	0.1811E+07
10.0000	0.2691E+04	0.1791E+07	10.0000	0.0	0.0	10.0000	0.1445E+04	0.1791E+07
11.0000	0.2691E+04	0.1767E+07	11.0000	0.0	0.0	11.0000	0.1393E+04	0.1670E+07
12.0000	0.2691E+04	0.1637E+07	12.0000	0.0	0.0	12.0000	0.1358E+04	0.1637E+07
13.0000	0.2691E+04	0.1610E+07	13.0000	0.0	0.0	13.0000	0.1337E+04	0.1610E+07
14.0000	0.2691E+04	0.1535E+07	14.0000	0.0	0.0	14.0000	0.1314E+04	0.1503E+07
15.0000	0.2691E+04	0.1554E+07	15.0000	0.0	0.0	15.0000	0.1290E+04	0.1554E+07
16.0000	0.2691E+04	0.1480E+07	16.0000	0.0	0.0	16.0000	0.1268E+04	0.1480E+07
17.0000	0.2691E+04	0.1405E+07	17.0000	0.0	0.0	17.0000	0.1240E+04	0.1405E+07
18.0000	0.2691E+04	0.1335E+07	18.0000	0.0	0.0	18.0000	0.1187E+04	0.1335E+07
19.0000	0.2691E+04	0.1267E+07	19.0000	0.0	0.0	19.0000	0.1109E+04	0.1267E+07
20.0000	0.2691E+04	0.1210E+07	20.0000	0.0	0.0	20.0000	0.1054E+04	0.1210E+07
21.0000	0.2691E+04	0.1155E+07	21.0000	0.0	0.0	21.0000	0.1005E+04	0.1155E+07
22.0000	0.2691E+04	0.1070E+07	22.0000	0.0	0.0	22.0000	0.9619E+03	0.1109E+04
23.0000	0.2691E+04	0.1002E+07	23.0000	0.0	0.0	23.0000	0.8334E+03	0.1002E+07
24.0000	0.2691E+04	0.9496E+06	24.0000	0.0	0.0	24.0000	0.7900E+03	0.9496E+06
25.0000	0.2691E+04	0.9003E+06	25.0000	0.0	0.0	25.0000	0.7561E+03	0.9003E+06
26.0000	0.2691E+04	0.8505E+06	26.0000	0.0	0.0	26.0000	0.7002E+03	0.8505E+06
27.0000	0.2691E+04	0.8111E+06	27.0000	0.0	0.0	27.0000	0.6757E+03	0.8111E+06
28.0000	0.2691E+04	0.7703E+06	28.0000	0.0	0.0	28.0000	0.6406E+03	0.7703E+06
29.0000	0.2691E+04	0.7405E+06	29.0000	0.0	0.0	29.0000	0.6243E+03	0.7405E+06
30.0000	0.2691E+04	0.7214E+06	30.0000	0.0	0.0	30.0000	0.6219E+03	0.7214E+06
31.0000	0.2691E+04	0.6737E+06	31.0000	0.0	0.0	31.0000	0.5826E+03	0.6737E+06
32.0000	0.2691E+04	0.6309E+06	32.0000	0.0	0.0	32.0000	0.5263E+03	0.6309E+06
33.0000	0.2691E+04	0.5911E+06	33.0000	0.0	0.0	33.0000	0.4942E+03	0.5911E+06
34.0000	0.2691E+04	0.5564E+06	34.0000	0.0	0.0	34.0000	0.4655E+03	0.5564E+06
35.0000	0.2691E+04	0.5259E+06	35.0000	0.0	0.0	35.0000	0.4404E+03	0.5259E+06
36.0000	0.2691E+04	0.4951E+06	36.0000	0.0	0.0	36.0000	0.4255E+03	0.4951E+06
37.0000	0.2691E+04	0.4651E+06	37.0000	0.0	0.0	37.0000	0.3901E+03	0.4651E+06
38.0000	0.2691E+04	0.4161E+06	38.0000	0.0	0.0	38.0000	0.3512E+03	0.4161E+06
39.0000	0.2691E+04	0.4018E+06	39.0000	0.0	0.0	39.0000	0.3512E+03	0.4018E+06
40.0000	0.2691E+04	0.2640E+06	40.0000	0.0	0.0	40.0000	0.2191E+03	0.2640E+06
41.0000	0.2691E+04	0.2240E+06	41.0000	0.0	0.0	41.0000	0.2191E+03	0.2240E+06
42.0000	0.2691E+04	0.0	42.0000	0.0	0.0	42.0000	0.0	0.0
43.0000	0.2691E+04	0.0	43.0000	0.0	0.0	43.0000	0.0	0.0
44.0000	0.2691E+04	0.0	44.0000	0.0	0.0	44.0000	0.0	0.0
45.0000	0.2691E+04	0.0	45.0000	0.0	0.0	45.0000	0.0	0.0
46.0000	0.2691E+04	0.0	46.0000	0.0	0.0	46.0000	0.0	0.0
47.0000	0.2691E+04	0.0	47.0000	0.0	0.0	47.0000	0.0	0.0
48.0000	0.2691E+04	0.0	48.0000	0.0	0.0	48.0000	0.0	0.0
49.0000	0.2691E+04	0.0	49.0000	0.0	0.0	49.0000	0.0	0.0
50.0000	0.2691E+04	0.0	50.0000	0.0	0.0	50.0000	0.0	0.0
51.0000	0.2691E+04	0.0	51.0000	0.0	0.0	51.0000	0.0	0.0
52.0000	0.2691E+04	0.0	52.0000	0.0	0.0	52.0000	0.0	0.0
53.0000	0.2691E+04	0.0	53.0000	0.0	0.0	53.0000	0.0	0.0
54.0000	0.2691E+04	0.0	54.0000	0.0	0.0	54.0000	0.0	0.0
55.0000	0.2691E+04	0.0	55.0000	0.0	0.0	55.0000	0.0	0.0
56.0000	0.2691E+04	0.0	56.0000	0.0	0.0	56.0000	0.0	0.0
57.0000	0.2691E+04	0.0	57.0000	0.0	0.0	57.0000	0.0	0.0
58.0000	0.2691E+04	0.0	58.0000	0.0	0.0	58.0000	0.0	0.0
59.0000	0.2691E+04	0.0	59.0000	0.0	0.0	59.0000	0.0	0.0
60.0000	0.2691E+04	0.0	60.0000	0.0	0.0	60.0000	0.0	0.0
61.0000	0.2691E+04	0.0	61.0000	0.0	0.0	61.0000	0.0	0.0
62.0000	0.2691E+04	0.0	62.0000	0.0	0.0	62.0000	0.0	0.0
63.0000	0.2691E+04	0.0	63.0000	0.0	0.0	63.0000	0.0	0.0
64.0000	0.2691E+04	0.0	64.0000	0.0	0.0	64.0000	0.0	0.0
65.0000	0.2691E+04	0.0	65.0000	0.0	0.0	65.0000	0.0	0.0
66.0000	0.2691E+04	0.0	66.0000	0.0	0.0	66.0000	0.0	0.0
67.0000	0.2691E+04	0.0	67.0000	0.0	0.0	67.0000	0.0	0.0
68.0000	0.2691E+04	0.0	68.0000	0.0	0.0	68.0000	0.0	0.0
69.0000	0.2691E+04	0.0	69.0000	0.0	0.0	69.0000	0.0	0.0
70.0000	0.2691E+04	0.0	70.0000	0.0	0.0	70.0000	0.0	0.0
71.0000	0.2691E+04	0.0	71.0000	0.0	0.0	71.0000	0.0	0.0
72.0000	0.2691E+04	0.0	72.0000	0.0	0.0	72.0000	0.0	0.0
73.0000	0.2691E+04	0.0	73.0000	0.0	0.0	73.0000	0.0	0.0
74.0000	0.2691E+04	0.0	74.0000	0.0	0.0	74.0000	0.0	0.0
75.0000	0.2691E+04	0.0	75.0000	0.0	0.0	75.0000	0.0	0.0
76.0000	0.2691E+04	0.0	76.0000	0.0	0.0	76.0000	0.0	0.0
77.0000	0.2691E+04	0.0	77.0000	0.0	0.0	77.0000	0.0	0.0
78.0000	0.2691E+04	0.0	78.0000	0.0	0.0	78.0000	0.0	0.0
79.0000	0.2691E+04	0.0	79.0000	0.0	0.0	79.0000	0.0	0.0
80.0000	0.2691E+04	0.0	80.0000	0.0	0.0	80.0000	0.0	0.0
81.0000	0.2691E+04	0.0	81.0000	0.0	0.0	81.0000	0.0	0.0
82.0000	0.2691E+04	0.0	82.0000	0.0	0.0	82.0000	0.0	0.0
83.0000	0.2691E+04	0.0	83.0000	0.0	0.0	83.0000	0.0	0.0
84.0000	0.2691E+04	0.0	84.0000	0.0	0.0	84.0000	0.0	0.0
85.0000	0.2691E+04	0.0	85.0000	0.0	0.0	85.0000	0.0	0.0
86.0000	0.2691E+04	0.0	86.0000	0.0	0.0	86.0000	0.0	0.0
87.0000	0.2691E+04	0.0	87.0000	0.0	0.0	87.0000	0.0	0.0
88.0000	0.2691E+04	0.0	88.0000	0.0	0.0	88.0000	0.0	0.0
89.0000	0.2691E+04	0.0	89.0000	0.0	0.0	89.0000	0.0	0.0
90.0000	0.2691E+04	0.0	90.0000	0.0	0.0	90.0000	0.0	0.0
91.0000	0.2691E+04	0.0	91.0000	0.0	0.0	91.0000	0.0	0.0
92.0000	0.2691E+04	0.0	92.0000	0.0	0.0	92.0000	0.0	0.0
93.0000	0.2691E+04	0.0	93.0000	0.0	0.0	93.0000	0.0	0.0
94.0000	0.2691E+04	0.0	94.0000	0.0	0.0	94.0000	0.0	0.0
95.0000	0.2691E+04	0.0	95.0000	0.0	0.0	95.0000	0.0	0.0
96.0000	0.2691E+04	0.0	96.0000	0.0	0.0	96.0000	0.0	0.0
97.0000	0.2691E+04	0.0	97.0000	0.0	0.0	97.0000	0.0	0.0
98.0000	0.2691E+04	0.0	98.0000	0.0	0.0	98.0000	0.0	0.0
99.0000	0.2691E+04	0.0	99.0000	0.0	0.0	99.0000	0.0	0.0
100.0000	0.2691E+04	0.0	100.0000	0.0	0.0	100.0000	0.0	0.0
101.0000	0.2691E+04	0.0	101.0000	0.0	0.0	101.0000	0.0	0.0
102.0000	0.2691E+04	0.0	102.0000	0.0	0.0	102.0000	0.0	0.0
103.0000	0.2691E+04	0.0	103.0000	0.0	0.0	103.0000	0.0	0.0
104.0000	0.2691E+04	0.0	104.0000	0.0	0.0	104.0000	0.0	0.0
105.0000	0.2691E+04	0.0	105.0000	0.0	0.0	105.0000	0.0	0.0
106.0000	0.2691E+04	0.0	106.0000	0.0	0.0	106.0000	0.0	0.0
107.0000	0.2691E+04	0.0	107.0000	0.0	0.0	107.0000	0.0	0.0
108.0000	0.2691E+04	0.0	108.0000	0.0	0.0	108.0000	0.0	0.0
109.0000	0.2691E+04	0.0	109.0000	0.0	0.0	109.0000	0.0	0.0

FORWARD FLOW				REVERSE FLOW				TOTAL FLOW			
TIME (SEC)	FLOW (LBM/SEC)	ENERGY (BTU/SEC)	TIME (SEC)	FLOW (LBM/SEC)	ENERGY (BTU/SEC)	TIME (SEC)	FLOW (LBM/SEC)	ENERGY (BTU/SEC)	TIME (SEC)	FLOW (LBM/SEC)	ENERGY (BTU/SEC)
0.0	0.221E+04	0.270E+07	0.0	0.419E+04	0.502E+07	0.0	0.644E+04	0.773E+07	0.0	0.644E+04	0.773E+07
0.0	0.255E+04	0.276E+07	0.0	0.419E+04	0.502E+07	0.0	0.644E+04	0.773E+07	0.0	0.644E+04	0.773E+07
0.0100	0.255E+04	0.276E+07	0.0100	0.451E+04	0.541E+07	0.0100	0.676E+04	0.811E+07	0.0100	0.676E+04	0.811E+07
1.0000	0.216E+04	0.257E+07	1.0000	0.429E+04	0.515E+07	1.0000	0.643E+04	0.773E+07	1.0000	0.643E+04	0.773E+07
2.0000	0.197E+04	0.237E+07	2.0000	0.395E+04	0.475E+07	2.0000	0.593E+04	0.713E+07	2.0000	0.593E+04	0.713E+07
3.0000	0.156E+04	0.202E+07	3.0000	0.369E+04	0.444E+07	3.0000	0.553E+04	0.668E+07	3.0000	0.553E+04	0.668E+07
4.0000	0.174E+04	0.207E+07	4.0000	0.349E+04	0.419E+07	4.0000	0.522E+04	0.659E+07	4.0000	0.522E+04	0.659E+07
5.0000	0.157E+04	0.195E+07	5.0000	0.331E+04	0.399E+07	5.0000	0.497E+04	0.596E+07	5.0000	0.497E+04	0.596E+07
6.0000	0.157E+04	0.195E+07	6.0000	0.320E+04	0.395E+07	6.0000	0.492E+04	0.592E+07	6.0000	0.492E+04	0.592E+07
7.0000	0.162E+04	0.195E+07	7.0000	0.324E+04	0.391E+07	7.0000	0.407E+04	0.506E+07	7.0000	0.407E+04	0.506E+07
7.5000	0.161E+04	0.194E+07	7.5000	0.323E+04	0.389E+07	7.5000	0.404E+04	0.503E+07	7.5000	0.404E+04	0.503E+07
8.0000	0.162E+04	0.192E+07	8.0000	0.0	0.0	8.0000	0.264E+04	0.310E+07	8.0000	0.264E+04	0.310E+07
8.5000	0.159E+04	0.192E+07	8.5000	0.0	0.0	8.5000	0.159E+04	0.192E+07	8.5000	0.159E+04	0.192E+07
9.0000	0.157E+04	0.192E+07	9.0000	0.0	0.0	9.0000	0.157E+04	0.192E+07	9.0000	0.157E+04	0.192E+07
10.0000	0.155E+04	0.187E+07	10.0000	0.0	0.0	10.0000	0.155E+04	0.187E+07	10.0000	0.155E+04	0.187E+07
11.0000	0.152E+04	0.182E+07	11.0000	0.0	0.0	11.0000	0.152E+04	0.182E+07	11.0000	0.152E+04	0.182E+07
12.0000	0.152E+04	0.182E+07	12.0000	0.0	0.0	12.0000	0.150E+04	0.180E+07	12.0000	0.150E+04	0.180E+07
13.0000	0.147E+04	0.177E+07	13.0000	0.0	0.0	13.0000	0.147E+04	0.177E+07	13.0000	0.147E+04	0.177E+07
14.0000	0.145E+04	0.173E+07	14.0000	0.0	0.0	14.0000	0.144E+04	0.173E+07	14.0000	0.144E+04	0.173E+07
15.0000	0.141E+04	0.169E+07	15.0000	0.0	0.0	15.0000	0.141E+04	0.169E+07	15.0000	0.141E+04	0.169E+07
17.5000	0.133E+04	0.160E+07	17.5000	0.0	0.0	17.5000	0.133E+04	0.160E+07	17.5000	0.133E+04	0.160E+07
20.0000	0.126E+04	0.151E+07	20.0000	0.0	0.0	20.0000	0.126E+04	0.151E+07	20.0000	0.126E+04	0.151E+07
22.5000	0.119E+04	0.143E+07	22.5000	0.0	0.0	22.5000	0.119E+04	0.143E+07	22.5000	0.119E+04	0.143E+07
25.0000	0.113E+04	0.136E+07	25.0000	0.0	0.0	25.0000	0.113E+04	0.136E+07	25.0000	0.113E+04	0.136E+07
27.5000	0.106E+04	0.130E+07	27.5000	0.0	0.0	27.5000	0.106E+04	0.130E+07	27.5000	0.106E+04	0.130E+07
30.0000	0.103E+04	0.128E+07	30.0000	0.0	0.0	30.0000	0.103E+04	0.124E+07	30.0000	0.103E+04	0.124E+07
35.0000	0.960E+03	0.115E+07	35.0000	0.0	0.0	35.0000	0.960E+03	0.115E+07	35.0000	0.960E+03	0.115E+07
40.0000	0.901E+03	0.108E+07	40.0000	0.0	0.0	40.0000	0.901E+03	0.108E+07	40.0000	0.901E+03	0.108E+07
45.0000	0.854E+03	0.103E+07	45.0000	0.0	0.0	45.0000	0.854E+03	0.103E+07	45.0000	0.854E+03	0.103E+07
50.0000	0.821E+03	0.993E+06	50.0000	0.0	0.0	50.0000	0.821E+03	0.979E+06	50.0000	0.821E+03	0.979E+06
60.0000	0.771E+03	0.927E+06	60.0000	0.0	0.0	60.0000	0.771E+03	0.927E+06	60.0000	0.771E+03	0.927E+06
70.0000	0.735E+03	0.862E+06	70.0000	0.0	0.0	70.0000	0.735E+03	0.862E+06	70.0000	0.735E+03	0.862E+06
80.0000	0.715E+03	0.859E+06	80.0000	0.0	0.0	80.0000	0.715E+03	0.859E+06	80.0000	0.715E+03	0.859E+06
90.0000	0.694E+03	0.835E+06	90.0000	0.0	0.0	90.0000	0.694E+03	0.859E+06	90.0000	0.694E+03	0.859E+06
100.0000	0.672E+03	0.833E+06	100.0000	0.0	0.0	100.0000	0.672E+03	0.833E+06	100.0000	0.672E+03	0.833E+06
120.0000	0.633E+03	0.759E+06	120.0000	0.0	0.0	120.0000	0.633E+03	0.759E+06	120.0000	0.633E+03	0.759E+06
140.0000	0.597E+03	0.716E+06	140.0000	0.0	0.0	140.0000	0.597E+03	0.716E+06	140.0000	0.597E+03	0.716E+06
160.0000	0.563E+03	0.678E+06	160.0000	0.0	0.0	160.0000	0.563E+03	0.678E+06	160.0000	0.563E+03	0.678E+06
180.0000	0.539E+03	0.645E+06	180.0000	0.0	0.0	180.0000	0.539E+03	0.645E+06	180.0000	0.539E+03	0.645E+06
200.0000	0.515E+03	0.616E+06	200.0000	0.0	0.0	200.0000	0.515E+03	0.616E+06	200.0000	0.515E+03	0.616E+06
220.0000	0.466E+03	0.557E+06	220.0000	0.0	0.0	220.0000	0.466E+03	0.557E+06	220.0000	0.466E+03	0.557E+06
240.0000	0.446E+03	0.537E+06	240.0000	0.0	0.0	240.0000	0.446E+03	0.537E+06	240.0000	0.446E+03	0.537E+06
260.0000	0.429E+03	0.515E+06	260.0000	0.0	0.0	260.0000	0.429E+03	0.515E+06	260.0000	0.429E+03	0.515E+06
280.0000	0.407E+03	0.497E+06	280.0000	0.0	0.0	280.0000	0.407E+03	0.497E+06	280.0000	0.407E+03	0.497E+06
300.0000	0.395E+03	0.475E+06	300.0000	0.0	0.0	300.0000	0.395E+03	0.475E+06	300.0000	0.395E+03	0.475E+06
320.0000	0.369E+03	0.444E+06	320.0000	0.0	0.0	320.0000	0.369E+03	0.444E+06	320.0000	0.369E+03	0.444E+06
340.0000	0.349E+03	0.419E+06	340.0000	0.0	0.0	340.0000	0.349E+03	0.419E+06	340.0000	0.349E+03	0.419E+06
360.0000	0.324E+03	0.391E+06	360.0000	0.0	0.0	360.0000	0.324E+03	0.391E+06	360.0000	0.324E+03	0.391E+06
380.0000	0.323E+03	0.389E+06	380.0000	0.0	0.0	380.0000	0.323E+03	0.389E+06	380.0000	0.323E+03	0.389E+06
400.0000	0.0	0.0	400.0000	0.0	0.0	400.0000	0.0	0.0	400.0000	0.0	0.0
420.0000	0.0	0.0	420.0000	0.0	0.0	420.0000	0.0	0.0	420.0000	0.0	0.0
440.0000	0.0	0.0	440.0000	0.0	0.0	440.0000	0.0	0.0	440.0000	0.0	0.0
460.0000	0.0	0.0	460.0000	0.0	0.0	460.0000	0.0	0.0	460.0000	0.0	0.0
480.0000	0.0	0.0	480.0000	0.0	0.0	480.0000	0.0	0.0	480.0000	0.0	0.0
500.0000	0.0	0.0	500.0000	0.0	0.0	500.0000	0.0	0.0	500.0000	0.0	0.0
520.0000	0.0	0.0	520.0000	0.0	0.0	520.0000	0.0	0.0	520.0000	0.0	0.0
540.0000	0.0	0.0	540.0000	0.0	0.0	540.0000	0.0	0.0	540.0000	0.0	0.0
560.0000	0.0	0.0	560.0000	0.0	0.0	560.0000	0.0	0.0	560.0000	0.0	0.0
580.0000	0.0	0.0	580.0000	0.0	0.0	580.0000	0.0	0.0	580.0000	0.0	0.0
600.0000	0.0	0.0	600.0000	0.0	0.0	600.0000	0.0	0.0	600.0000	0.0	0.0
620.0000	0.0	0.0	620.0000	0.0	0.0	620.0000	0.0	0.0	620.0000	0.0	0.0
640.0000	0.0	0.0	640.0000	0.0	0.0	640.0000	0.0	0.0	640.0000	0.0	0.0
660.0000	0.0	0.0	660.0000	0.0	0.0	660.0000	0.0	0.0	660.0000	0.0	0.0
680.0000	0.0	0.0	680.0000	0.0	0.0	680.0000	0.0	0.0	680.0000	0.0	0.0
700.0000	0.0	0.0	700.0000	0.0	0.0	700.0000	0.0	0.0	700.0000	0.0	0.0
720.0000	0.0	0.0	720.0000	0.0	0.0	720.0000	0.0	0.0	720.0000	0.0	0.0
740.0000	0.0	0.0	740.0000	0.0	0.0	740.0000	0.0	0.0	740.0000	0.0	0.0
760.0000	0.0	0.0	760.0000	0.0	0.0	760.0000	0.0	0.0	760.0000	0.0	0.0
780.0000	0.0	0.0	780.0000	0.0	0.0	780.0000	0.0	0.0	780.0000	0.0	0.0
800.0000	0.0	0.0	800.0000	0.0	0.0	800.0000	0.0	0.0	800.0000	0.0	0.0
820.0000	0.0	0.0	820.0000	0.0	0.0	820.0000	0.0	0.0	820.0000	0.0	0.0
840.0000	0.0	0.0	840.0000	0.0	0.0	840.0000	0.0	0.0	840.0000	0.0	0.0
860.0000	0.0	0.0	860.0000	0.0	0.0	860.0000	0.0	0.0	860.0000	0.0	0.0
880.0000	0.0	0.0	880.0000	0.0	0.0	880.0000	0.0	0.0	880.0000	0.0	0.0
900.0000	0.0	0.0	900.0000	0.0	0.0	900.0000	0.0	0.0	900.0000	0.0	0.0
920.0000	0.0	0.0	920.0000	0.0	0.0	920.0000	0.0	0.0	920.0000	0.0	0.0
940.0000	0.0	0.0	940.0000	0.0	0.0	940.0000	0.0	0.0	940.0000	0.0	0.0
960.0000	0.0	0.0	960.0000	0.0	0.0	960.0000	0.0	0.0	960.0000	0.0	0.0
980.0000	0.0	0.0	980.0000	0.0	0.0	980.0000	0.0	0.0	980.0000	0.0	0.0
1000.0000	0.0	0.0	1000.0000	0.0	0.0	1000.0000	0.0	0.0	1000.0000	0.0	0.0

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FORWARD FLOW				REVERSE FLOW				TOTAL FLOW			
TIME (SEC)	FLOW (LBM/SEC)	ENERGY (BTU/SEC)	TIME (SEC)	FLOW (LBM/SEC)	ENERGY (BTU/SEC)	TIME (SEC)	FLOW (LBM/SEC)	ENERGY (BTU/SEC)			
0.0	0.2966E+04	0.3535E+07	0.0	0.5509E+04	0.6506E+07	0.0	0.8475E+04	0.1010E+08			
0.0	0.2966E+04	0.3535E+07	0.0	0.5509E+04	0.6506E+07	0.0	0.8475E+04	0.1010E+08			
0.0100	0.2966E+04	0.3535E+07	0.0100	0.5509E+04	0.6506E+07	0.0100	0.8475E+04	0.1010E+08			
1.0000	0.2966E+04	0.3535E+07	1.0000	0.5509E+04	0.6506E+07	1.0000	0.8475E+04	0.1010E+08			
2.0000	0.2966E+04	0.3535E+07	2.0000	0.5509E+04	0.6506E+07	2.0000	0.8475E+04	0.1010E+08			
3.0000	0.2966E+04	0.3535E+07	3.0000	0.5509E+04	0.6506E+07	3.0000	0.8475E+04	0.1010E+08			
4.0000	0.2966E+04	0.3535E+07	4.0000	0.5509E+04	0.6506E+07	4.0000	0.8475E+04	0.1010E+08			
5.0000	0.2966E+04	0.3535E+07	5.0000	0.5509E+04	0.6506E+07	5.0000	0.8475E+04	0.1010E+08			
6.0000	0.2966E+04	0.3535E+07	6.0000	0.5509E+04	0.6506E+07	6.0000	0.8475E+04	0.1010E+08			
7.0000	0.2966E+04	0.3535E+07	7.0000	0.5509E+04	0.6506E+07	7.0000	0.8475E+04	0.1010E+08			
8.0000	0.2966E+04	0.3535E+07	8.0000	0.5509E+04	0.6506E+07	8.0000	0.8475E+04	0.1010E+08			
9.0000	0.2966E+04	0.3535E+07	9.0000	0.5509E+04	0.6506E+07	9.0000	0.8475E+04	0.1010E+08			
10.0000	0.2966E+04	0.3535E+07	10.0000	0.5509E+04	0.6506E+07	10.0000	0.8475E+04	0.1010E+08			
11.0000	0.2966E+04	0.3535E+07	11.0000	0.5509E+04	0.6506E+07	11.0000	0.8475E+04	0.1010E+08			
12.0000	0.2966E+04	0.3535E+07	12.0000	0.5509E+04	0.6506E+07	12.0000	0.8475E+04	0.1010E+08			
13.0000	0.2966E+04	0.3535E+07	13.0000	0.5509E+04	0.6506E+07	13.0000	0.8475E+04	0.1010E+08			
14.0000	0.2966E+04	0.3535E+07	14.0000	0.5509E+04	0.6506E+07	14.0000	0.8475E+04	0.1010E+08			
15.0000	0.2966E+04	0.3535E+07	15.0000	0.5509E+04	0.6506E+07	15.0000	0.8475E+04	0.1010E+08			
16.0000	0.2966E+04	0.3535E+07	16.0000	0.5509E+04	0.6506E+07	16.0000	0.8475E+04	0.1010E+08			
17.0000	0.2966E+04	0.3535E+07	17.0000	0.5509E+04	0.6506E+07	17.0000	0.8475E+04	0.1010E+08			
18.0000	0.2966E+04	0.3535E+07	18.0000	0.5509E+04	0.6506E+07	18.0000	0.8475E+04	0.1010E+08			
19.0000	0.2966E+04	0.3535E+07	19.0000	0.5509E+04	0.6506E+07	19.0000	0.8475E+04	0.1010E+08			
20.0000	0.2966E+04	0.3535E+07	20.0000	0.5509E+04	0.6506E+07	20.0000	0.8475E+04	0.1010E+08			
21.0000	0.2966E+04	0.3535E+07	21.0000	0.5509E+04	0.6506E+07	21.0000	0.8475E+04	0.1010E+08			
22.0000	0.2966E+04	0.3535E+07	22.0000	0.5509E+04	0.6506E+07	22.0000	0.8475E+04	0.1010E+08			
23.0000	0.2966E+04	0.3535E+07	23.0000	0.5509E+04	0.6506E+07	23.0000	0.8475E+04	0.1010E+08			
24.0000	0.2966E+04	0.3535E+07	24.0000	0.5509E+04	0.6506E+07	24.0000	0.8475E+04	0.1010E+08			
25.0000	0.2966E+04	0.3535E+07	25.0000	0.5509E+04	0.6506E+07	25.0000	0.8475E+04	0.1010E+08			
26.0000	0.2966E+04	0.3535E+07	26.0000	0.5509E+04	0.6506E+07	26.0000	0.8475E+04	0.1010E+08			
27.0000	0.2966E+04	0.3535E+07	27.0000	0.5509E+04	0.6506E+07	27.0000	0.8475E+04	0.1010E+08			
28.0000	0.2966E+04	0.3535E+07	28.0000	0.5509E+04	0.6506E+07	28.0000	0.8475E+04	0.1010E+08			
29.0000	0.2966E+04	0.3535E+07	29.0000	0.5509E+04	0.6506E+07	29.0000	0.8475E+04	0.1010E+08			
30.0000	0.2966E+04	0.3535E+07	30.0000	0.5509E+04	0.6506E+07	30.0000	0.8475E+04	0.1010E+08			
31.0000	0.2966E+04	0.3535E+07	31.0000	0.5509E+04	0.6506E+07	31.0000	0.8475E+04	0.1010E+08			
32.0000	0.2966E+04	0.3535E+07	32.0000	0.5509E+04	0.6506E+07	32.0000	0.8475E+04	0.1010E+08			
33.0000	0.2966E+04	0.3535E+07	33.0000	0.5509E+04	0.6506E+07	33.0000	0.8475E+04	0.1010E+08			
34.0000	0.2966E+04	0.3535E+07	34.0000	0.5509E+04	0.6506E+07	34.0000	0.8475E+04	0.1010E+08			
35.0000	0.2966E+04	0.3535E+07	35.0000	0.5509E+04	0.6506E+07	35.0000	0.8475E+04	0.1010E+08			
36.0000	0.2966E+04	0.3535E+07	36.0000	0.5509E+04	0.6506E+07	36.0000	0.8475E+04	0.1010E+08			
37.0000	0.2966E+04	0.3535E+07	37.0000	0.5509E+04	0.6506E+07	37.0000	0.8475E+04	0.1010E+08			
38.0000	0.2966E+04	0.3535E+07	38.0000	0.5509E+04	0.6506E+07	38.0000	0.8475E+04	0.1010E+08			
39.0000	0.2966E+04	0.3535E+07	39.0000	0.5509E+04	0.6506E+07	39.0000	0.8475E+04	0.1010E+08			
40.0000	0.2966E+04	0.3535E+07	40.0000	0.5509E+04	0.6506E+07	40.0000	0.8475E+04	0.1010E+08			
41.0000	0.2966E+04	0.3535E+07	41.0000	0.5509E+04	0.6506E+07	41.0000	0.8475E+04	0.1010E+08			
42.0000	0.2966E+04	0.3535E+07	42.0000	0.5509E+04	0.6506E+07	42.0000	0.8475E+04	0.1010E+08			
43.0000	0.2966E+04	0.3535E+07	43.0000	0.5509E+04	0.6506E+07	43.0000	0.8475E+04	0.1010E+08			
44.0000	0.2966E+04	0.3535E+07	44.0000	0.5509E+04	0.6506E+07	44.0000	0.8475E+04	0.1010E+08			
45.0000	0.2966E+04	0.3535E+07	45.0000	0.5509E+04	0.6506E+07	45.0000	0.8475E+04	0.1010E+08			
46.0000	0.2966E+04	0.3535E+07	46.0000	0.5509E+04	0.6506E+07	46.0000	0.8475E+04	0.1010E+08			
47.0000	0.2966E+04	0.3535E+07	47.0000	0.5509E+04	0.6506E+07	47.0000	0.8475E+04	0.1010E+08			
48.0000	0.2966E+04	0.3535E+07	48.0000	0.5509E+04	0.6506E+07	48.0000	0.8475E+04	0.1010E+08			
49.0000	0.2966E+04	0.3535E+07	49.0000	0.5509E+04	0.6506E+07	49.0000	0.8475E+04	0.1010E+08			
50.0000	0.2966E+04	0.3535E+07	50.0000	0.5509E+04	0.6506E+07	50.0000	0.8475E+04	0.1010E+08			
51.0000	0.2966E+04	0.3535E+07	51.0000	0.5509E+04	0.6506E+07	51.0000	0.8475E+04	0.1010E+08			
52.0000	0.2966E+04	0.3535E+07	52.0000	0.5509E+04	0.6506E+07	52.0000	0.8475E+04	0.1010E+08			
53.0000	0.2966E+04	0.3535E+07	53.0000	0.5509E+04	0.6506E+07	53.0000	0.8475E+04	0.1010E+08			
54.0000	0.2966E+04	0.3535E+07	54.0000	0.5509E+04	0.6506E+07	54.0000	0.8475E+04	0.1010E+08			
55.0000	0.2966E+04	0.3535E+07	55.0000	0.5509E+04	0.6506E+07	55.0000	0.8475E+04	0.1010E+08			
56.0000	0.2966E+04	0.3535E+07	56.0000	0.5509E+04	0.6506E+07	56.0000	0.8475E+04	0.1010E+08			
57.0000	0.2966E+04	0.3535E+07	57.0000	0.5509E+04	0.6506E+07	57.0000	0.8475E+04	0.1010E+08			
58.0000	0.2966E+04	0.3535E+07	58.0000	0.5509E+04	0.6506E+07	58.0000	0.8475E+04	0.1010E+08			
59.0000	0.2966E+04	0.3535E+07	59.0000	0.5509E+04	0.6506E+07	59.0000	0.8475E+04	0.1010E+08			
60.0000	0.2966E+04	0.3535E+07	60.0000	0.5509E+04	0.6506E+07	60.0000	0.8475E+04	0.1010E+08			
61.0000	0.2966E+04	0.3535E+07	61.0000	0.5509E+04	0.6506E+07	61.0000	0.8475E+04	0.1010E+08			
62.0000	0.2966E+04	0.3535E+07	62.0000	0.5509E+04	0.6506E+07	62.0000	0.8475E+04	0.1010E+08			
63.0000	0.2966E+04	0.3535E+07	63.0000	0.5509E+04	0.6506E+07	63.0000	0.8475E+04	0.1010E+08			
64.0000	0.2966E+04	0.3535E+07	64.0000	0.5509E+04	0.6506E+07	64.0000	0.8475E+04	0.1010E+08			
65.0000	0.2966E+04	0.3535E+07	65.0000	0.5509E+04	0.6506E+07	65.0000	0.8475E+04	0.1010E+08			
66.0000	0.2966E+04	0.3535E+07	66.0000	0.5509E+04	0.6506E+07	66.0000	0.8475E+04	0.1010E+08			
67.0000	0.2966E+04	0.3535E+07	67.0000	0.5509E+04	0.6506E+07	67.0000	0.8475E+04	0.1010E+08			
68.0000	0.2966E+04	0.3535E+07	68.0000	0.5509E+04	0.6506E+07	68.0000	0.8475E+04	0.1010E+08			
69.0000	0.2966E+04	0.3535E+07	69.0000	0.5509E+04	0.6506E+07	69.0000	0.8475E+04	0.1010E+08			
70.0000	0.2966E+04	0.3535E+07	70.0000	0.5509E+04	0.6506E+07	70.0000	0.8475E+04	0.1010E+08			
71.0000	0.2966E+04	0.3535E+07	71.0000	0.5509E+04	0.6506E+07	71.0000	0.8475E+04	0.1010E+08			
72.0000	0.2966E+04	0.3535E+07	72.0000	0.5509E+04	0.6506E+07	72.0000	0.8475E+04	0.1010E+08			
73.0000	0.2966E+04	0.3535E+07	73.0000	0.5509E+04	0.6506E+07	73.0000	0.8475E+04	0.1010E+08			
74.0000	0.2966E+04	0.3535E+07	74.0000	0.5509E+04	0.6506E+07	74.0000	0.8475E+04	0.1010E+08			
75.0000	0.2966E+04	0.3535E+07	75.0000	0.5509E+04	0.6506E+07	75.0000	0.8475E+04	0.1010E+08			
76.0000	0.2966E+04	0.3535E+07	76.0000	0.5509E+04	0.6506E+07	76.0000	0.8475E+04	0.1010E+08			
77.0000	0.2966E+04	0.3535E+07	77.0000	0.5509E+04	0.6506E+07	77.0000	0.8475E+04	0.1010E+08			
78.0000	0.2966E+04	0.3535E+07	78.0000	0.5509E+04	0.6506E+07	78.0000	0.8475E+04	0.1010E+08			
79.0000	0.2966E+04	0.3535E+07	79.0000	0.5509E+04	0.6506E+07	79.0000	0.8475E+04	0.1010E+08			
80.0000	0.2966E+04	0.3535E+07	80.0000	0.5509E+04	0.6506E+07	80.0000	0.8475E+04	0.1010E+08			
81.0000	0.2966E+04	0.3535E+07	81.0000	0.5509E+04	0.6506E+07	81.0000	0.8475E+04	0.1010E+08			
82.0000	0.2966E+04	0.3535E+07	82.0000	0.5509E+04	0.6506E+07	82.0000	0.8475E+04	0.1010E+08			
83.0000	0.2966E+04	0.3535E+07	83.0000	0.5509E+04	0.6506E+07	83.0000	0.8475E+04	0.1010E+08			
84.0000	0.2966E+04	0.3535E+07	84.0000	0.5509E+04	0.6506E+07	84.0000	0.8475E+04	0.1010E+08			
85.0000	0.2966E+04	0.3535E+07	85.0000	0.5509E+04	0.6506E+07	85.0000	0.8475E+04	0.1010E+08			
86.0000	0.2966E+04	0.3535E+07	86.0000	0.5509E+04	0.6506E+07	86.0000	0.8475E+04	0.1010E+08			
87.0000	0.2966E+04	0.3535E+07	87.0000	0.5509E+04	0.6506E+07	87.0000	0.8475E+04	0.1010E+08			
88.0000	0.2966E+04	0.3535E+07	88.0000	0.5509E+04	0.6506E+07	88.0000	0.8475E+04	0.1010E+08			
89.0000	0.2966E+04	0.3535E+07	89.0000	0.5509E+04	0.6506E+07	89.0000	0.8475E+04	0.1010E+08			
90.0000	0.2966E+04	0.3535E+07	90.0000	0.5509E+04	0.6506E+07	90.0000	0.8475E+04	0.1010E+08			
91.0000	0.2966E+04	0.3535E+07	91.0000	0.5509E+04	0.6506E+07	91.0000	0.8475E+04	0.1010E+08			
92.0000	0.2966E+04	0.3535E+07	92.0000	0.55							