Appendix F
Computer Runs

Section I. H5310

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  EXAMPLE of Lock Filling

CONDUIT GEOMETRY: LENGTH =   490.0 FT.  WIDTH=  14.0 FT.
                  HEIGHT= 14.0 FT.  N= 2-CULVERT OPERATION)

CHAMBER GEOMETRY: LENGTH = 670.0 FT.  WIDTH =110.0 FT.

LOSS COEFFICIENT: INTAKE    .200
        UPSTREAM CONDUIT    .050
      DOWNSTREAM CONDUIT    .950
                MANIFOLD    .750
       TOTAL(VALVE OPEN)  2.050   LOCK COEF.= .698

ELEVATIONS: UPPER POOL 409.60
            LOWER POOL 329.90
           CULVERT ROOF 312.00


VALVE OPENS AT   1.00-MIN. RATE FOR   1.00 MINUTES


ACC.VEL. ERROR TO I= 47 IS     .06014
ACC.VEL. ERROR TO I= 54 IS     .33680


LOCK FILLS TO UPPER POOL IN  9.37 MINUTES
EXTREME ELEVATION AT TIME = 10.60 MINUTES
MAX COMPUTED OVERTRAVEL = 1.27 FT.
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VALVE PARAMETERS					ELEVATIONS (FT-DATUM)				
TIME (M)	OPEN. RATIO	CONT. COEF.	LOSS COEF.	TOTAL INFLOW CFS	LOCK CHAMBER	US VALVE WELL	PIEZ.HD VALVE	DS VALVE WELL	CAV.PAR.
.00	1.00	.80	10000.00	0.	329.90	409.60	329.90	329.90	9.99
.20	.13	.77	86.65	2802.	330.13	408.61	328.93	330.72	.78
.40	.29	.66	19.28	5598.	330.81	405.64	320.13	333.19	.59
.60	.49	.67	4.42	9865.	332.07	397.31	314.73	339.45	.49
.80	.73	.76	.73	15220.	334.11	380.34	327.05	351.67	.71
1.00	1.00	.90	.10	18095.	336.83	368.24	360.48	361.64	2.03
2.00	1.00	.90	.10	16954.	351.33	373.29	366.48	373.11	2.48
3.00	1.00	.90	.10	14989.	364.33	381.22	375.90	381.36	3.51
4.00	1.00	.90	.10	13024.	375.73	388.17	384.15	388.59	5.04
5.00	1.00	.90	.10	11059.	385.54	394.15	391.25	394.80	7.45
6.00	1.00	.90	.10	9094.	393.74	399.15	397.19	400.01	9.99
7.00	1.00	.90	.10	7129.	400.34	403.18	401.98	404.19	9.99
8.00	1.00	.90	.10	5164.	405.35	406.23	405.60	407.37	9.99
9.00	1.00	.90	.10	3199.	408.75	408.31	408.06	409.53	9.99
10.00	1.00	.90	.10	1234.	410.56	409.41	409.37	410.67	9.99
11.00	1.00	.90	.10	-658.	410.77	409.57	409.52	410.74	9.99
12.00	1.00	.90	.10	-1257.	409.87	409.48	409.32	409.75	9.99

	RATE RISE (F/M)	VEL. (F/S)	VEL HDS(F) REF. AREA	VENA CONT.	DIFFERENTIAL HDS(F) VALVE LOSS	TOTAL	INERTIA	OVERALL
.00	.000	.000	.000	.000	79.700	79.700	.000	79.700
.20	2.281	7.147	.793	80.472	68.724	70.270	9.055	79.472
.40	4.558	14.282	3.167	88.676	61.076	67.252	11.425	78.788
.60	8.031	25.166	9.835	92.407	43.447	62.624	15.564	77.529
.80	12.391	38.828	23.410	76.693	17.183	62.832	13.311	75.487
1.00	14.731	46.160	33.086	40.847	3.309	67.827	5.078	72.775
2.00	13.802	43.249	29.045	35.858	2.905	59.543	-1.269	58.274
3.00	12.203	38.238	22.704	28.029	2.270	46.542	-1.271	45.271
4.00	10.603	33.225	17.141	21.162	1.714	35.139	-1.271	33.868
5.00	9.003	28.212	12.359	15.258	1.236	25.336	-1.271	24.065
6.00	7.404	23.199	8.357	10.318	.836	17.133	-1.271	15.861
7.00	5.804	18.187	5.136	6.341	.514	10.529	-1.271	9.257
8.00	4.204	13.174	2.695	3.327	.269	5.525	-1.271	4.253
9.00	2.605	8.161	1.034	1.277	.103	2.120	-1.271	.849
10.00	1.005	3.149	.154	.190	.015	.316	-1.271	-.956
11.00	-.535	-1.678	.044	.044	.004	.090	-.971	-1.169
12.00	-1.023	-3.207	.160	.160	.016	.327	2.060	-.273

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DO YOU NEED TO STORE THE OUTPUT IN A DATA FILE?Y OR N
N

ENTER END OR RERUN
E
Stop - Program terminated.
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EXAMPLE Downstream Surge

OUTPUT CODES-  AP= 1 AQ= 1 AR= 1 AS= 1

AP.PROBLEM STATEMENT
1.TRAPEZOIDAL CANAL:.INITIAL DEPTH= 12.90 FT INITIAL FLOW=       .00 CFS
  BOTTOM WIDTH=  220.00 SIDESLOPE= 1V:  1.000H
2.INITIAL STATION=   731.00 FT
  STATION VALUES INCREASE DOWNSTREAM
3.INITIAL TIME=      .0 SEC
    TIME STEP=   10.0 SEC
   TOTAL STEPS=   24
4.LOCK EMPTYING;SURGE TRAVELS DOWNSTREAM.
  LOCK-CHAMBER EQUALIZATION TIME=  660.0 SEC
5.LOCK FLOW PLUS INITIAL CHANNEL FLOW:
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TIME (SEC)	FLOW (CFS)	TIME (SEC)	FLOW (CFS)	TIME (SEC)	FLOW (CFS)
.0	.000	80.0	15950.000	160.0	13750.000
10.0	2750.000	90.0	15675.000	170.0	13475.000
20.0	5500.000	100.0	15400.000	180.0	13200.000
30.0	8250.000	110.0	15125.000	190.0	12925.000
40.0	11000.000	120.0	14850.000	200.0	12650.000
50.0	13750.000	130.0	14575.000	210.0	12375.000
60.0	16500.000	140.0	14300.000	220.0	12100.000
70.0	16225.000	150.0	14025.000	230.0	11825.000

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6.PROFILES NEEDED AT THE FOLLOWING 1 TIMES (SEC):
  120.000
7.HYDROGRAPHS NEEDED AT THE FOLLOWING 1 STATIONS (FT):
  731.000

AQ.SURGE CHARACTERISTICS:
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STEP	TIME (SEC)	FLOW (CFS)	SURGE VEL. (FPS)	DEPTH (FT)	AVE. VEL. (FPS)	FROUDE NUMBER
1	.000	.000	19.839	12.900	.000	.000
2	10.000	2750.000	20.458	13.444	.878	.043
3	20.000	5500.000	21.701	13.958	1.692	.082
4	30.000	8250.000	22.858	14.445	2.452	.117
5	40.000	11000.000	23.942	14.911	3.168	.149
6	50.000	13750.000	24.964	15.357	3.844	.178
7	60.000	16500.000	25.932	15.787	4.487	.204
8	70.000	16225.000	26.392	15.745	4.425	.202
9	80.000	15950.000	26.299	15.702	4.361	.199
10	90.000	15675.000	26.206	15.660	4.298	.197
11	100.000	15400.000	26.113	15.617	4.234	.194
12	110.000	15125.000	26.019	15.574	4.170	.191
13	120.000	14850.000	25.924	15.531	4.106	.189
14	130.000	14575.000	25.829	15.487	4.041	.186
15	140.000	14300.000	25.734	15.444	3.976	.183
16	150.000	14025.000	25.638	15.400	3.910	.180
17	160.000	13750.000	25.542	15.356	3.845	.178
18	170.000	13475.000	25.445	15.312	3.778	.175
19	180.000	13200.000	25.347	15.268	3.712	.172
20	190.000	12925.000	25.250	15.224	3.645	.169
21	200.000	12650.000	25.151	15.179	3.578	.166
22	210.000	12375.000	25.052	15.135	3.511	.163
23	220.000	12100.000	24.953	15.090	3.443	.160
24	230.000	11825.000	24.853	15.045	3.375	.158

EXAMPLE Surge Upstream

OUTPUT CODES: AP= 1 AQ= 1 AR= 1 AS= 1

AP.PROBLEM STATEMENT
1.TRAPEZOIDAL CANAL: INITIAL DEPTH= 15.50 FT INITIAL FLOW= .00 CFS
BOTTOM WIDTH= 220.00 SIDESLOPE= 1V: 1.000H
2.INITIAL STATION= 1400.00 FT
STATION VALUES INCREASE UPSTREAM
3.INITIAL TIME= .0 SEC
TIME STEP= 10.0 SEC
TOTAL STEPS= 24
4.LOCK FILLING:SURGE TRAVELS UPSTREAM.
LOCK-CHAMBER EQUALIZATION TIME: 480.0 SEC
5.LOCK FLOW PLUS INITIAL CHANNEL FLOW:

TIME (SEC)	FLOW (CFS)	TIME (SEC)	FLOW (CFS)	TIME (SEC)	FLOW (CFS)
.0	.000	80.0	16190.480	160.0	12952.380
10.0	2833.333	90.0	15785.710	170.0	12547.620
20.0	5666.667	100.0	15380.950	180.0	12142.860
30.0	8500.000	110.0	14976.190	190.0	11738.100
40.0	11333.330	120.0	14571.430	200.0	11333.330
50.0	14166.670	130.0	14166.670	210.0	10928.570
60.0	17000.000	140.0	13761.900	220.0	10523.810
70.0	16595.240	150.0	13357.140	230.0	10119.050

6.PROFILES NEEDED AT THE FOLLOWING 1 TIMES (SEC):
120.000
7.HYDROGRAPHS NEEDED AT THE FOLLOWING 1 STATIONS (FT):
1400.000

AQ.SURGE CHARACTERISTICS:

STEP	TIME (SEC)	FLOW (CFS)	SURGE VEL. (FPS)	DEPTH (FT)	AVE. VEL. (FPS)	FROUDE NUMBER
1	.000	.000	-21.640	15.500	.000	.000
2	10.000	2833.333	-21.086	14.962	.804	.038
3	20.000	5666.667	-19.857	14.391	1.672	.080
4	30.000	8500.000	-18.521	13.779	2.619	.128
5	40.000	11333.330	-17.050	13.113	3.670	.184
6	50.000	14166.670	-15.398	12.376	4.861	.251
7	60.000	17000.000	-13.488	11.533	6.259	.335
8	70.000	16595.240	-12.564	11.661	6.043	.322
9	80.000	16190.480	-12.879	11.787	5.833	.309
10	90.000	15785.710	-13.185	11.909	5.629	.297
11	100.000	15380.950	-13.482	12.028	5.430	.285
12	110.000	14976.190	-13.772	12.145	5.236	.273
13	120.000	14571.430	-14.055	12.260	5.047	.262
14	130.000	14166.670	-14.331	12.372	4.862	.251
15	140.000	13761.900	-14.601	12.483	4.681	.241
16	150.000	13357.140	-14.864	12.591	4.505	.231
17	160.000	12952.380	-15.123	12.698	4.332	.221
18	170.000	12547.620	-15.376	12.802	4.162	.212
19	180.000	12142.860	-15.623	12.905	3.995	.202
20	190.000	11738.100	-15.867	13.007	3.832	.193
21	200.000	11333.330	-16.105	13.107	3.672	.185
22	210.000	10928.570	-16.340	13.206	3.514	.176
23	220.000	10523.810	-16.570	13.303	3.359	.168
24	230.000	10119.050	-16.796	13.399	3.207	.159