Supporting Information

A General Modeling Framework for the Long-Term Scheduling of Multiproduct Pipelines with Delivery Constraints

Hossein Mostafaei[1*], and Alireza Ghaffari Hadigheh[1]

[1]Department of Applied Mathematics, Azarbiajan Shahid Madani University, Tabriz-Iran

To whom correspondence should be addressed:

E-mail: h.mostafaei65@azaruniv.edu.

Table S1: Flow set point for each valve at every pumping run of Example 1.

	Flow set point for each valve at every operation [m^3/h]									
Run	V-S1	V-D1	V-S2	V-D2	V-S3	V-D3	V-S4	V-D4	V-S5	V-D5
1	1200	0	1200	480	720	0	720	0	720	720
2	1200	0	1200	0	1200	360	840	840	0	0
3	1200	0	1200	0	1200	0	1200	528	672	672
4	910	0	910	0	910	0	910	706	204	204
5	1200	0	1200	0	1200	0	1200	456	744	744
6	1200	0	1200	0	1200	580	620	43	577	577
7	700	0	700	0	700	0	700	670	30	30
8	940	616	324	17	307	0	307	153.5	153.5	153.5
9	700	0	700	658.8	41.4	0	41.2	0	41.2	41.2
10	700	28	672	0	672	0	672	0	672	672
11	700	0	700	310	390	0	390	384	6	6
12	1200	261.5	938.5	369.2	569.3	369.2	200.1	0	200.1	200.1
13	1200	0	1200	0	1200	853.7	346.3	0	346.3	346.3
14	1200	942.5	257.5	0	257.5	0	257.5	214.2	43.3	43.3
15	1200	203.7	996.3	0	996.3	973.5	22.8	0	22.8	22.8
16	1200	23	1177	0	1177	415.3	761.7	268	493.7	493.7
17	1200	0	1200	913	287	0	287	265.7	21.3	21.3
18	805	0	805	0	805	0	805	269	536	536
19	1200	698.5	501.5	0	501.5	0	501.5	0	501.5	501.5
20	1200	0	1200	0	1200	0	1200	1152	48	48
21	1200	0	1200	0	1200	0	1200	1103	97	97
22	1071	4.2	1066.8	51.3	1015.5	434.4	581.1	501.1	80	80
23	1200	0	1200	145	1055	0	1055	0	1055	1055

Table S2: Flow set point for each valve at every pumping run of Example 2.

	Flow set point for each valve at every operation [m^3/h]									
Run	V-S1	V-D1	V-S2	V-D2	V-S3	V-D3	V-S4	V-D4	V-54	V-D5
1	800	0	800	800	0	0	0	0	0	0
2	864	0	864	0	864	154.7	709.3	709.3	0	0
3	1200	0	1200	0	1200	0	1200	528.3	671.7	671.7
4	1200	0	1200	0	1200	0	1200	800	400	400
5	1200	0	1200	0	1200	0	1200	540.9	659.1	659.1
6	1200	0	1200	0	1200	0	1200	456	744	744
7	1200	0	1200	0	1200	580.78	619.22	42.70	576.52	576.52
8	900	300	600	600	0	0	0	0	0	0
9	1200	600	600	600	0	0	0	0	0	0
10	725	0	725	125	600	0	600	0	600	600
11	746	146	600	0	600	0	600	600	0	0
12	879	0	879	0	879	0	879	479	400	400
13	700	0	700	0	700	700	0	0	0	0
14	700	23.3	676.7	676.7	0	0	0	0	0	0
15	903	0	903	0	903	903	0	0	0	0
16	1200	600	600	0	600	0	600	92.7	507.3	507.3
17	1200	45.2	1154.8	0	1154.8	1154.8	0	0	0	0
18	1200	184.6	1015.4	152.4	863	254	609	609	0	0
19	1200	0	1200	600	600	0	600	0	600	600
20	1200	0	1200	0	1200	0	1200	1200	0	0
21	1200	600	600	0	600	0	600	0	600	600
22	1187	550	637	0	637	0	637	637	0	0
23	1200	0	1200	520.8	679.2	0	679.2	109.6	569.6	569.6
24	1200	0	1200	0	1200	513.13	686.87	686.77	0	0
25	926	0	926	0	926	0	926	472	454	454
26	1200	600	600	600	0	0	0	0	0	0