

DAFTAR PUSTAKA

- Ariafar, K., Buttswort, D., Sharifi, N., and Malpress, R, 2014. “*Ejector Primary Nozzle Steam Condensation*” : Area Ratio Effects and Mixing Layer Development, Australia : University of Southern Queensland.
- Ghurri, Ainul, 2015. “*Aliran Fluida Internal dan Eksternal*”. Buku Ajar, Universitas Udayana, Bali.
- Harinaldi. Budiarmo, 2015. *Sistem Fluida*. Jakarta : Penerbit Erlangga.
- Khamdani, Fatih, Yohana, and Eflita, 2014. “*Studi eksperimental aliran campuran air-crude oil yang melalui pipa pengecilan mendadak horizontal berpenampang lingkaran*”. Undergraduate Thesis, Mechanical Engineering Departement, Faculty Engineering of Diponegoro University.
- Priyanto, Eko Singgih. 2014. “*Analisa aliran fluida pada pipa Acrylic diameter 12,7 mm (0,5 inci) dan 38,1 mm (1,5 inci)*. Fakultas Teknologi Industri, Universitas Gunadarma,
- Ramadhan, Syahrin. *Studi Bentuk Dan Posisi Optimal Nosel Inlet Pada Pemanfaatan Aliran Buritan Kapal Sebagai Sumber Air Pendingin Mesin Utama Kapal*. Skripsi, Departemen Teknik Sistem Perkapalan Fakultas Teknik Universitas Hasanuddin Makassar, 2018.
- Ridwan, Mohd, Sulaiman. 2008. “*Parameter design propeller kapal*”. Program studi Diploma III, Teknik perkapalan, Universitas Diponegoro.
- Triatmodjo. Bambang, 2014. *Hidraulika*. Yogyakarta : Beta Offset.
- Triyanti. Irmiyana, 2015. “*Analisa Pengaruh Bentuk Foil Section Nozzle Terhadap Efisiensi Propulsi Kapal Pada Kapal Tunda*. Surabaya” : Institut Teknologi Sepuluh November.

Vahaji, S., Akbarzadeh, A., Date A., and Cheung, S.C.P, 2015. “*Study On The Efficiency of a Concergent-Divergent Two- Phase Nozzle as a Motive Force for Power Generation from Low Temperature Geothermal Resource*”. Proceeding World Geothermal Congress. Melbourne, Australia.

LAMPIRAN

Lampiran 1. Persiapan pengambilan data

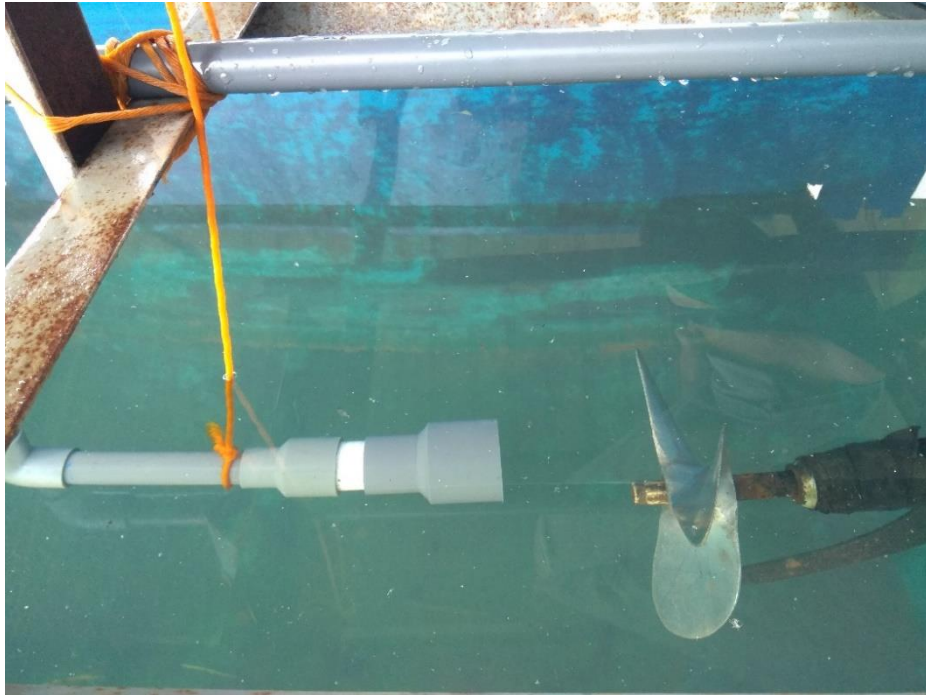


(a)

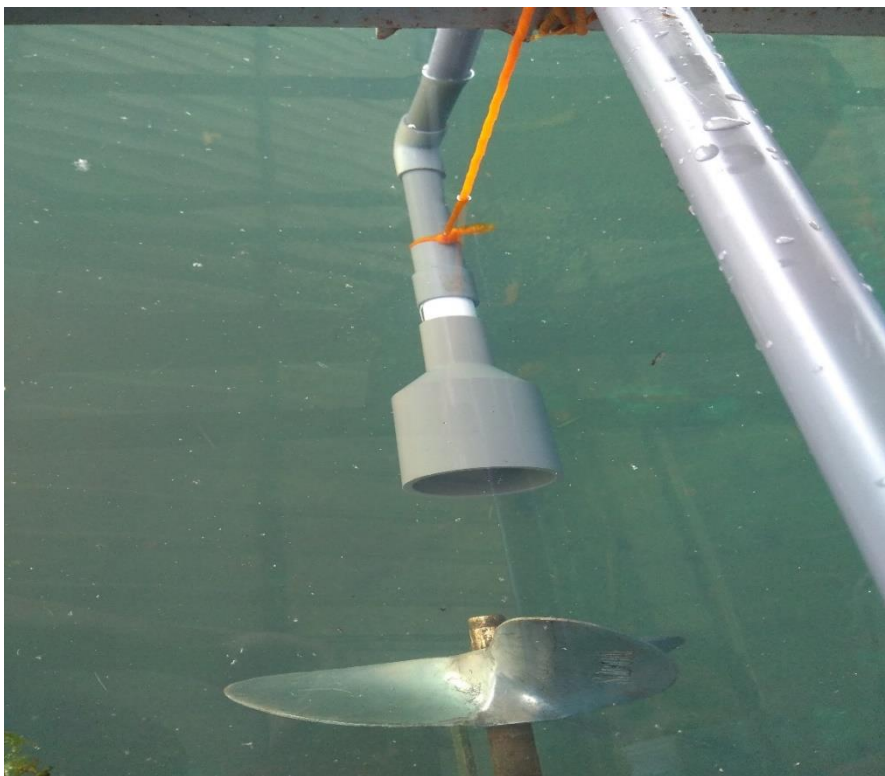


(b)

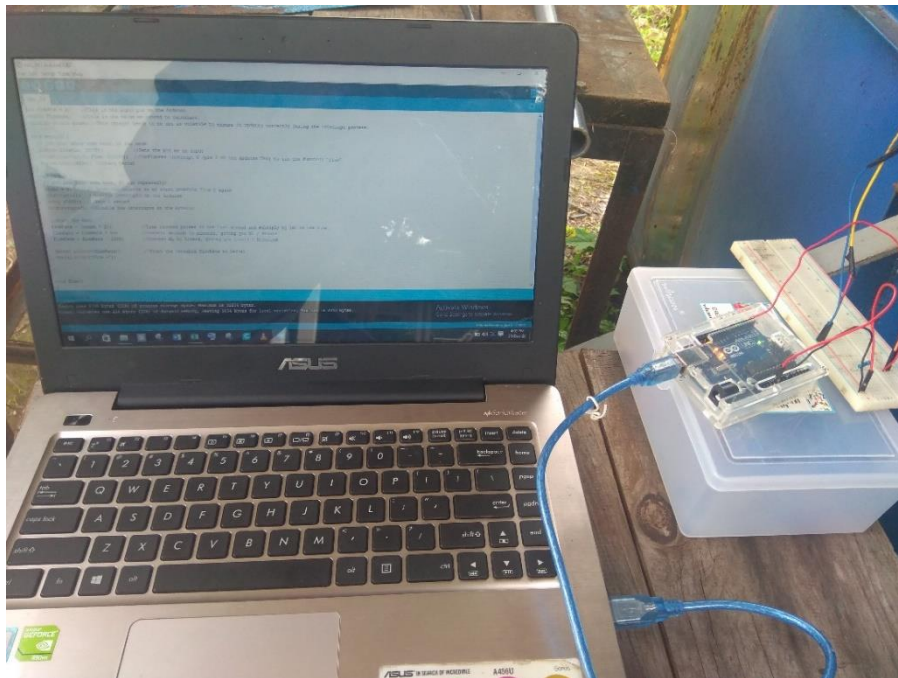
Gambar 1. Perlengkapan pengambilan data (a) PC dan alat sensor (b) motor listrik dan voltage regulator



Gambar 2. Pemasangan alat pengujian pada 0,7R daun propeller tampak samping



Gambar 3. Pemasangan alat pengujian pada 0,7R daun propeller tampak depan



Gambar 4. Pemasangan alat pengukuran dan disambungkan ke PC

Lampiran 2. Proses pengambilan data



Gambar 1. Pengukuran putaran mesin



Gambar 2. Proses pengujian nosel *inlet*



Gambar 3. Aliran air yang dihasilkan



Gambar 4. Hasil pengukuran kecepatan aliran masuk

Lampiran 3. Tabel karakteristik fisik fluida air

Temperature T (°C)	Specific Weight γ (kN/m ³)	Density ^a ρ (kg/m ³)	Dynamic Viscosity ^b μ ($\times 10^{-3}$ kg/m-s)	Kinematic Viscosity ν ($\times 10^{-6}$ m ² /s)	Surface Tension ^c σ (N/m)	Modulus of Elasticity ^a E ($\times 10^9$ N/m ²)	Vapor Pressure P_v (kN/m ²)
0	9.805	999.8	1.781	1.785	0.0765	1.98	0.61
5	9.807	1000.0	1.518	1.519	0.0749	2.05	0.87
10	9.804	999.7	1.307	1.306	0.0742	2.10	1.23
15	9.798	999.1	1.139	1.139	0.0735	2.15	1.70
20	9.789	998.2	1.002	1.003	0.0728	2.17	2.34
25	9.777	997.0	0.890	0.893	0.0720	2.22	3.17
30	9.764	995.7	0.798	0.800	0.0712	2.25	4.24
40	9.730	992.2	0.653	0.658	0.0696	2.28	7.38
50	9.689	988.0	0.547	0.553	0.0679	2.29	12.33
60	9.642	983.2	0.466	0.474	0.0662	2.28	19.92
70	9.589	977.8	0.404	0.413	0.0644	2.25	31.16
80	9.530	971.8	0.354	0.364	0.0626	2.20	47.34
90	9.466	965.3	0.315	0.326	0.0608	2.14	70.10
100	9.399	958.4	0.282	0.294	0.0589	2.07	101.33

Source: Adapted from J. K. Venard and R. L. Street (1975). *Elementary Fluid Mechanics*, 5th ed., Wiley, New York.

Gambar 1. Tabel karakteristik fisik fluida air

Lampiran 4. Perhitungan koefisien gesek fluida (f)

Penentuan koefisien gesek fluida dilihat dari karakteristik jenis aliran fluida berdasarkan bilangan *Reynold* (Re), maka :

$$Re = \frac{V \cdot D}{\nu}$$

dimana : Re = Bilangan Reynold
 v = Kecepatan rata-rata aliran (m/s)
 D = Diameter pipa (m)
 ν = Viskositas kinematik (m²/s)

$$Re = \frac{0,13 \cdot 0,0127}{0,895 \cdot 10^{-6}}$$

$$Re = 1879,27$$

Karena nilai Re < 2300, maka aliran fluida bersifat laminar. Jadi nilai koefisien gesek fluida (f) adalah :

$$f = \frac{64}{Re}$$

$$f = \frac{64}{1879,27} = 0,0341$$

Lampiran 5. Perhitungan koefisien kekasaran

Tabel 1. Nilai kekasaran (k) dalam mm untuk erbagai jenis pipa

No	Material Pipa	halus	Rata2	Kasar
1.	Gelas	0	0.003	0.006
2.	Baja halus, PVC, AC	0.015	0.03	0.06
3.	Baja biasa	0.03	0.06	0.15
4.	Galvanis	0.06	0.15	0.3
5.	Besi, pipa lining semen	0.15	0.3	0.6
6.	Beton	0.3	0.6	1.5
7.	Baja kasar	1.5	3	6
8.	Water mains	6.0	15	30
9.	Batu yg tak dilining, tanah	60	150	300

(sumber: *Pipeflow Analysis, Stepenshon*)

Gambar 1. Nilai kekasaran relatif jenis pipa

Perhitungan koefisien kekasaran berdasarkan rumus :

$$K = \frac{f}{D}$$

Dimana :

K = Koefisien kekasaran

f = Kekasaran relatif pipa (mm) (tabel nilai kekasaran)

D = Diameter pipa (m)

$$K = \frac{f}{D}$$

$$K = \frac{0,000015 \text{ m}}{0,0127 \text{ m}}$$

$$K = 0,0012$$

Lampiran 6. Data Loger hasil pengukuran pada *flowmeter sensor*

Bundar 1

900	1200	1500
11:27:27.744 -> Flow =2.12	11:31:47.446 -> Flow =6.00	13:55:18.824 -> Flow =5.00
11:27:28.728 -> Flow =2.22	11:31:48.431 -> Flow =6.90	13:55:19.796 -> Flow =7.82
11:27:29.713 -> Flow =4.45	11:31:49.462 -> Flow =7.50	13:55:20.804 -> Flow =7.80
11:27:30.744 -> Flow =1.25	11:31:50.447 -> Flow =7.32	13:55:21.812 -> Flow =8.40
11:27:31.728 -> Flow =2.89	11:31:51.431 -> Flow =7.04	13:55:22.820 -> Flow =8.14
11:27:32.713 -> Flow =3.82	11:31:52.462 -> Flow =6.67	13:55:23.792 -> Flow =8.70
11:27:33.744 -> Flow =2.12	11:31:53.447 -> Flow =7.72	13:55:24.800 -> Flow =8.18
11:27:34.729 -> Flow =7.72	11:31:54.431 -> Flow =7.80	13:55:25.808 -> Flow =9.48
11:27:35.713 -> Flow =7.63	11:31:55.463 -> Flow =9.64	13:55:26.816 -> Flow =9.00
11:27:36.745 -> Flow =7.83	11:31:56.447 -> Flow =8.50	13:55:27.824 -> Flow =8.70
11:27:37.729 -> Flow =7.20	11:31:57.432 -> Flow =6.60	13:55:28.796 -> Flow =9.30
11:27:38.713 -> Flow =7.80	11:31:58.463 -> Flow =6.90	13:55:29.804 -> Flow =9.30
11:27:39.745 -> Flow =7.90	11:31:59.448 -> Flow =8.20	13:55:30.812 -> Flow =9.00
11:27:40.729 -> Flow =7.60	11:32:00.432 -> Flow =7.80	13:55:31.820 -> Flow =9.90
11:27:41.714 -> Flow =7.20	11:32:01.463 -> Flow =8.10	13:55:32.828 -> Flow =9.60
11:27:42.745 -> Flow =7.90	11:32:02.448 -> Flow =7.20	13:55:33.800 -> Flow =10.80
11:27:43.730 -> Flow =7.60	Flow =6.90	13:55:34.808 -> Flow =10.20
11:27:44.714 -> Flow =7.04	11:32:04.464 -> Flow =6.90	13:55:35.816 -> Flow =10.86
11:27:45.745 -> Flow =7.75	11:32:05.448 -> Flow =7.80	13:55:36.824 -> Flow =10.55
11:27:46.730 -> Flow =6.40	11:32:06.433 -> Flow =8.60	13:55:37.796 -> Flow =10.86
Flow =6.44	11:32:07.464 -> Flow =8.52	13:55:38.804 -> Flow =10.22
11:27:48.746 -> Flow =6.69	11:32:08.449 -> Flow =7.52	13:55:39.812 -> Flow =10.24
11:27:49.730 -> Flow =7.85	11:32:09.480 -> Flow =7.52	13:55:40.820 -> Flow =10.22
11:27:50.715 -> Flow =7.64	11:32:10.464 -> Flow =7.52	Flow =10.50
11:27:51.746 -> Flow =6.78	11:32:11.449 -> Flow =6.80	13:55:42.800 -> Flow =10.20
11:27:52.731 -> Flow =8.30	11:32:12.433 -> Flow =5.10	13:55:43.808 -> Flow =10.18
11:27:53.762 -> Flow =8.30	11:32:13.465 -> Flow =6.05	13:55:44.816 -> Flow =10.50
11:27:54.746 -> Flow =8.90	11:32:14.449 -> Flow =8.56	13:55:45.824 -> Flow =10.20
11:27:55.731 -> Flow =8.30	11:32:15.434 -> Flow =8.72	13:55:46.796 -> Flow =10.80
Flow =7.98	11:32:16.465 -> Flow =8.24	13:55:47.804 -> Flow =9.90
11:27:57.747 -> Flow =7.98	11:32:17.449 -> Flow =8.54	13:55:48.812 -> Flow =9.90
11:27:58.731 -> Flow =7.98	11:32:18.481 -> Flow =8.57	13:55:49.820 -> Flow =10.20
11:27:59.716 -> Flow =6.80	11:32:19.465 -> Flow =8.58	13:55:50.828 -> Flow =10.50
11:28:00.747 -> Flow =7.12	11:32:20.450 -> Flow =6.92	13:55:51.800 -> Flow =10.52
11:28:01.732 -> Flow =8.50	11:32:21.434 -> Flow =8.24	13:55:52.808 -> Flow =10.86
11:28:02.763 -> Flow =7.50	11:32:22.466 -> Flow =8.56	13:55:53.816 -> Flow =10.80
11:28:03.747 -> Flow =8.83	11:32:23.450 -> Flow =8.42	13:55:54.824 -> Flow =11.10

11:28:04.732 -> Flow =8.83	11:32:24.435 -> Flow =10.68	Flow =10.80
Flow =8.82	11:32:25.466 -> Flow =10.81	13:55:56.804 -> Flow =11.10
11:28:06.748 -> Flow =8.82	11:32:26.450 -> Flow =9.82	13:55:57.812 -> Flow =10.80
11:28:07.732 -> Flow =8.82	11:32:27.482 -> Flow =9.28	13:55:58.812 -> Flow =10.54
11:28:08.764 -> Flow =8.20	11:32:28.466 -> Flow =9.92	13:55:59.820 -> Flow =10.88
11:28:09.748 -> Flow =8.20	11:32:29.451 -> Flow =9.86	13:56:00.829 -> Flow =10.50
11:28:10.732 -> Flow =9.58	11:32:30.435 -> Flow =10.86	13:56:01.801 -> Flow =11.12
11:28:11.764 -> Flow =9.54	11:32:31.467 -> Flow =10.86	13:56:02.809 -> Flow =10.50
11:28:12.748 -> Flow =10.58	11:32:32.451 -> Flow =9.98	13:56:03.817 -> Flow =10.80
11:28:13.733 -> Flow =8.98	11:32:33.482 -> Flow =10.24	13:56:04.825 -> Flow =10.50
11:28:14.717 -> Flow =8.50	11:32:34.467 -> Flow =9.86	Flow =10.80
11:28:15.749 -> Flow =8.50	11:32:35.451 -> Flow =9.56	13:56:06.805 -> Flow =10.29
11:28:16.733 -> Flow =8.50	Flow =8.72	13:56:07.813 -> Flow =10.14
11:28:17.764 -> Flow =9.70	11:32:37.467 -> Flow =9.56	13:56:08.821 -> Flow =10.78
11:28:18.533 -> Flow =7.84	11:32:38.452 -> Flow =9.56	13:56:09.829 -> Flow =10.82
11:28:19.217 -> Flow =7.29	11:32:39.483 -> Flow =8.06	13:56:10.801 -> Flow =10.50
11:28:20.248 -> Flow =9.92	11:32:40.468 -> Flow =9.88	13:56:11.809 -> Flow =10.80
11:28:21.563 -> Flow =9.84		13:56:12.817 -> Flow =10.25
11:28:22.478 -> Flow =8.60		13:56:13.825 -> Flow =11.20
11:28:23.117 -> Flow =8.60		Flow =11.10
11:28:24.705 -> Flow =8.90		13:56:15.805 -> Flow =11.25
11:28:25.734 -> Flow =7.20		13:56:16.813 -> Flow =11.25
11:28:26.214 -> Flow =7.56		

Bundar 2

900

1200

1500

11:44:12.496 -> Flow =2.06	4.32	15:54:39.122 -> Flow =0.90
11:44:13.480 -> Flow =4.52	15:51:17.635 -> Flow =4.37	15:54:40.153 -> Flow =0.30
11:44:14.512 -> Flow =4.48	15:51:18.633 -> Flow =5.67	15:54:41.137 -> Flow =1.80
11:44:15.496 -> Flow =7.12	15:51:19.635 -> Flow =7.62	15:54:42.122 -> Flow =3.60
11:44:16.481 -> Flow =7.82	15:51:20.640 -> Flow =7.86	15:54:43.153 -> Flow =5.06
11:44:17.512 -> Flow =7.56	15:51:21.646 -> Flow =7.72	15:54:44.138 -> Flow =6.00
11:44:18.497 -> Flow =7.24	15:51:22.655 -> Flow =7.82	15:54:45.122 -> Flow =7.72
11:44:19.481 -> Flow =7.50	15:51:23.659 -> Flow =8.12	15:54:46.154 -> Flow =11.10
11:44:20.512 -> Flow =7.80	15:51:24.627 -> Flow =6.90	15:54:47.138 -> Flow =10.80
11:44:21.497 -> Flow =7.82	15:51:25.634 -> Flow =6.60	15:54:48.123 -> Flow =9.00
11:44:22.481 -> Flow =7.86	15:51:26.641 -> Flow =5.67	15:54:49.154 -> Flow =7.80
11:44:23.513 -> Flow =8.10	15:51:27.644 -> Flow =7.62	15:54:50.138 -> Flow =9.60
11:44:24.497 -> Flow =8.12	15:51:28.645 -> Flow =7.86	15:54:51.123 -> Flow =10.80
11:44:25.482 -> Flow =7.82	15:51:29.643 -> Flow =7.72	15:54:52.154 -> Flow =11.10
11:44:26.513 -> Flow =7.82	15:51:30.643 -> Flow =7.82	15:54:53.139 -> Flow =9.90
11:44:27.498 -> Flow =7.84	15:51:31.647 -> Flow =8.12	15:54:54.123 -> Flow =10.50

11:44:28.482 -> Flow =7.85	15:51:32.649 -> Flow =8.40	15:54:55.155 -> Flow =10.20
11:44:29.513 -> Flow =7.82	15:51:33.649 -> Flow =8.10	15:54:56.139 -> Flow =10.80
11:44:30.498 -> Flow =7.80	15:51:34.654 -> Flow =8.70	15:54:57.124 -> Flow =10.80
11:44:31.482 -> Flow =7.50	Flow =8.10	15:54:58.155 -> Flow =10.80
11:44:32.514 -> Flow =8.10	15:51:36.659 -> Flow =9.00	15:54:59.139 -> Flow =10.80
11:44:33.498 -> Flow =7.20	15:51:37.631 -> Flow =9.00	15:55:00.124 -> Flow =11.10
11:44:34.483 -> Flow =7.80	15:51:38.634 -> Flow =8.70	15:55:01.155 -> Flow =10.50
11:44:35.514 -> Flow =7.50	15:51:39.633 -> Flow =7.30	15:55:02.140 -> Flow =9.30
11:44:36.499 -> Flow =7.50	15:51:40.641 -> Flow =7.30	15:55:03.124 -> Flow =9.90
Flow =8.10	15:51:41.642 -> Flow =7.08	15:55:04.156 -> Flow =10.20
11:44:38.514 -> Flow =7.50	15:51:42.641 -> Flow =7.90	15:55:05.140 -> Flow =10.50
11:44:39.499 -> Flow =7.50	15:51:43.645 -> Flow =9.60	15:55:06.124 -> Flow =10.50
11:44:40.483 -> Flow =7.50	15:51:44.650 -> Flow =10.80	15:55:07.156 -> Flow =9.89
11:44:41.515 -> Flow =6.90	15:51:45.655 -> Flow =10.20	15:55:08.140 -> Flow =10.50
11:44:42.499 -> Flow =7.50	15:51:46.655 -> Flow =10.80	15:55:09.125 -> Flow =9.90
11:44:43.483 -> Flow =6.60	15:51:47.655 -> Flow =10.50	15:55:10.156 -> Flow =10.50
11:44:44.515 -> Flow =6.90	15:51:48.656 -> Flow =10.80	15:55:11.141 -> Flow =9.68
11:44:45.499 -> Flow =7.20	15:51:49.656 -> Flow =10.20	15:55:12.125 -> Flow =8.70
11:44:46.484 -> Flow =7.50	15:51:50.660 -> Flow =7.30	15:55:13.156 -> Flow =9.60
11:44:47.515 -> Flow =7.20	15:51:51.659 -> Flow =7.30	15:55:14.141 -> Flow =7.80
11:44:48.500 -> Flow =7.50	15:51:52.661 -> Flow =9.60	15:55:15.125 -> Flow =9.08
11:44:49.484 -> Flow =7.50	15:51:53.636 -> Flow =9.60	15:55:16.157 -> Flow =8.50
11:44:50.516 -> Flow =7.50	15:51:54.646 -> Flow =7.04	15:55:17.141 -> Flow =10.80
11:44:51.500 -> Flow =7.50	15:51:55.650 -> Flow =8.70	15:55:18.126 -> Flow =11.10
Flow =7.20	15:51:56.657 -> Flow =7.80	15:55:19.157 -> Flow =10.08
11:44:53.516 -> Flow =7.20	15:51:57.664 -> Flow =9.10	15:55:20.142 -> Flow =10.25
11:44:54.500 -> Flow =6.90	15:51:58.638 -> Flow =6.90	15:55:21.126 -> Flow =10.58
11:44:55.485 -> Flow =7.48	15:51:59.641 -> Flow =7.86	15:55:22.157 -> Flow =10.23
11:44:56.516 -> Flow =7.40	15:52:00.644 -> Flow =7.20	15:55:23.142 -> Flow =9.98
11:44:57.501 -> Flow =7.55	15:52:01.647 -> Flow =7.20	15:55:24.126 -> Flow =10.50
11:44:58.485 -> Flow =7.52	15:52:02.657 -> Flow =6.92	15:55:25.158 -> Flow =10.50
11:44:59.517 -> Flow =7.22	Flow =7.20	15:55:26.142 -> Flow =10.80
11:45:00.501 -> Flow =7.28	15:52:04.644 -> Flow =7.80	
Flow =7.20	15:52:05.649 -> Flow =7.80	
11:45:02.517 -> Flow =7.50	15:52:07.653 -> Flow =8.40	
11:45:03.501 -> Flow =7.50	15:52:07.657 -> Flow =8.10	
11:45:04.486 -> Flow =7.50	15:52:08.658 -> Flow =8.71	
11:45:05.517 -> Flow =7.50	15:52:09.663 -> Flow =8.12	
11:45:06.502 -> Flow =6.64	15:52:10.638 -> Flow =8.04	
11:45:07.533 -> Flow =7.08	15:52:11.640 -> Flow =8.66	
11:45:08.518 -> Flow =6.90		
11:45:09.502 -> Flow =5.46		
11:45:10.487 -> Flow =5.54		
11:45:11.518 -> Flow =7.50		

Bundar 3

900

1200

1500

7.80	15:59:57.116 -> Flow =4.30	6.60
Flow =8.10	15:59:58.100 -> Flow =5.72	16:07:01.604 -> Flow =5.10
15:58:23.918 -> Flow =7.80	15:59:59.132 -> Flow =8.10	16:07:02.603 -> Flow =4.92
15:58:24.918 -> Flow =7.74	16:00:00.116 -> Flow =5.70	16:07:03.602 -> Flow =7.50
15:58:25.919 -> Flow =7.80	16:00:01.101 -> Flow =7.50	16:07:04.607 -> Flow =7.50
15:58:26.918 -> Flow =7.57	16:00:02.132 -> Flow =7.80	Flow =6.30
15:58:27.918 -> Flow =7.50	16:00:03.116 -> Flow =7.90	16:07:06.632 -> Flow =8.50
15:58:28.918 -> Flow =7.84	16:00:04.101 -> Flow =8.10	16:07:07.632 -> Flow =9.80
15:58:29.918 -> Flow =7.50	16:00:05.132 -> Flow =9.40	16:07:08.627 -> Flow =8.80
15:58:30.917 -> Flow =7.28	16:00:06.117 -> Flow =9.50	16:07:09.624 -> Flow =8.40
15:58:31.918 -> Flow =6.92	16:00:07.101 -> Flow =10.10	16:07:10.619 -> Flow =8.70
15:58:32.917 -> Flow =7.20	16:00:08.132 -> Flow =8.40	16:07:11.618 -> Flow =8.80
15:58:33.918 -> Flow =7.50	16:00:09.117 -> Flow =6.30	16:07:12.614 -> Flow =6.60
15:58:34.918 -> Flow =7.47	16:00:10.101 -> Flow =9.91	16:07:13.615 -> Flow =9.60
15:58:35.917 -> Flow =7.18	16:00:11.133 -> Flow =9.85	16:07:14.616 -> Flow =8.50
15:58:36.917 -> Flow =7.50	16:00:12.117 -> Flow =7.20	16:07:15.614 -> Flow =8.80
15:58:37.917 -> Flow =6.36	16:00:13.102 -> Flow =7.80	16:07:16.615 -> Flow =8.70
15:58:38.919 -> Flow =6.65	16:00:14.133 -> Flow =9.30	16:07:17.614 -> Flow =10.80
15:58:39.917 -> Flow =6.90	16:00:15.118 -> Flow =7.80	16:07:18.614 -> Flow =8.80
15:58:40.917 -> Flow =6.90	16:00:16.102 -> Flow =4.20	16:07:19.615 -> Flow =8.26
15:58:41.917 -> Flow =7.20	16:00:17.133 -> Flow =4.70	16:07:20.614 -> Flow =7.52
15:58:42.917 -> Flow =7.54	16:00:18.118 -> Flow =5.10	16:07:21.608 -> Flow =8.42
15:58:43.917 -> Flow =6.82	16:00:19.102 -> Flow =8.55	16:07:22.609 -> Flow =7.52
15:58:44.917 -> Flow =7.52	16:00:20.134 -> Flow =5.12	Flow =8.10
15:58:45.917 -> Flow =7.80	16:00:21.118 -> Flow =4.20	16:07:24.634 -> Flow =10.20
15:58:46.917 -> Flow =7.50	16:00:22.103 -> Flow =3.92	16:07:25.632 -> Flow =7.50
15:58:47.916 -> Flow =6.08	16:00:23.134 -> Flow =4.81	16:07:26.627 -> Flow =8.08
15:58:48.917 -> Flow =6.12	16:00:24.119 -> Flow =9.90	16:07:27.625 -> Flow =8.30
15:58:49.917 -> Flow =6.06	16:00:25.103 -> Flow =8.30	16:07:28.627 -> Flow =8.37
15:58:50.918 -> Flow =6.18	16:00:26.134 -> Flow =5.10	16:07:29.625 -> Flow =8.72
15:58:51.917 -> Flow =6.24	16:00:27.119 -> Flow =9.90	16:07:30.621 -> Flow =9.60
15:58:52.917 -> Flow =7.98	16:00:28.103 -> Flow =4.20	16:07:31.621 -> Flow =10.98
15:58:53.916 -> Flow =5.40	16:00:29.135 -> Flow =8.60	16:07:32.619 -> Flow =10.50
15:58:54.917 -> Flow =5.70	16:00:30.119 -> Flow =8.08	16:07:33.615 -> Flow =10.80
15:58:55.917 -> Flow =4.50	16:00:31.104 -> Flow =8.10	16:07:34.616 -> Flow =10.78
15:58:56.916 -> Flow =4.87	16:00:32.135 -> Flow =8.10	16:07:35.616 -> Flow =11.40
15:58:57.916 -> Flow =4.53	16:00:33.120 -> Flow =9.90	16:07:36.614 -> Flow =11.33
15:58:58.917 -> Flow =4.52	16:00:34.104 -> Flow =10.20	16:07:37.615 -> Flow =8.10
15:58:59.916 -> Flow =3.68	16:00:35.135 -> Flow =9.90	16:07:38.615 -> Flow =8.06

15:59:00.916 -> Flow =5.08
15:59:01.919 -> Flow =5.72
15:59:02.916 -> Flow =8.60
15:59:03.916 -> Flow =3.60
15:59:04.920 -> Flow =6.02
15:59:05.916 -> Flow =6.80
15:59:06.916 -> Flow =6.30
15:59:07.916 -> Flow =6.90
15:59:08.916 -> Flow =3.60
15:59:09.914 -> Flow =4.20

16:00:36.120 -> Flow =9.90
16:00:37.104 -> Flow =9.30
16:00:38.136 -> Flow =7.80
16:00:39.120 -> Flow =6.90
16:00:40.105 -> Flow =6.90
16:00:41.136 -> Flow =9.30
16:00:42.120 -> Flow =9.30
16:00:43.105 -> Flow =7.80
16:00:44.136 -> Flow =6.90
16:00:45.121 -> Flow =6.90

16:07:39.614 -> Flow =9.72
16:07:40.615 -> Flow =9.32
16:07:41.615 -> Flow =8.02
16:07:42.613 -> Flow =10.89
16:07:43.613 -> Flow =9.04
16:07:44.617 -> Flow =9.30