



KAHRAMANMARAŞ
SU VE KANALİZASYON İDARESİ
GENEL MÜDÜRLÜĞÜ
PLANLAMA VE YATIRIM DAİRESİ BAŞKANLIĞI

YÜKLENİCİ



KARAPINAR
PROJE MÜŞAVİRLİK LTD.ŞTİ.

Aşağı Öveçler Mah. 1314.Cad. No : 46/3
Çankaya / ANKARA

Tel : (0312) 397 11 44 Faks : (0312) 397 11 44
www.karapinar.com.tr

DEĞİŞİKLİK				TARİH	İMZA
a.)					
b.)					
KAHRAMANMARAŞ (MERKEZ) İÇMESUYU TERFİ HATTI PROJESİ TERFİLİ HAT DARBE HESAP RAPORU				ÖLÇEK :	
				NO'LU	
				PLAN İPTAL EDİLDİ.	
				NO'LU	
				PLAN İPTAL EDİLDİ.	
				PLAN NO: RAP-DAR-01	
PROJEYİ YAPAN	İMZA	TARİH	PROJE	ARŞİV KAYIT NO:	
Mehmet Selçuk KARAPINAR İnş. Müh. Dip. No. : 2010-0204091 Oda sicil no: (81374)			 KARAPINAR PROJE MÜŞAVİRLİK LTD.ŞTİ. Aşağı Öveçler Mah. 1314.Cad. No:46/3 Çankaya / ANKARA Tel : (0312) 397 11 44 Faks : (0312) 397 11 44 www.karapinar.com.tr		
PROJE KONTROL					
Kürşad KARAPINAR İnş.Yük.Müh.,Çevre Müh. Dip.No.:82696- 82740 Oda sicil no: (81038),(07244)					

K.MARAŞ İÇMESUYU
1.KADEME VE 2.KADEME
POMPA İSTASYONU
SÜREKLİ (NORMAL) DURUM VE SU DARBESİ
HESAPLARI

İÇİNDEKİLER

1	GİRİŞ.....	3
2	SİMULASYON DİYAGRAMLARI VE GİRDİLER.....	4
3	ALTERNATİF ÇALIŞMALAR.....	4
3.1	K.MARAS İÇMESUYU 1.KADEME ve 2.KADEME POMPA İSTASYONU	4
3.1.1	K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wdx.....	6
3.1.2	K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdx.....	8
3.1.3	K.MARAS 1.KD -KAZANLI -03 JUL 17.wdx.....	10
3.1.4	K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wdx.....	13
3.1.5	K.MARAS 1.KD+2.KD -KAZANLI -Min Hm-03 JUL 17.wdx.....	16
4	HESAP SONUÇLARININ DEĞERLENDİRİLMESİ.....	19
3.1.1	K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wdx.....	19
3.1.2	K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdx.....	20
3.1.3	K.MARAS 1.KD -KAZANLI -03 JUL 17.wdx.....	21
3.1.4	K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wdx.....	23
3.1.5	K.MARAS 1.KD+2.KD -KAZANLI -Min Hm-03 JUL 17.wdx.....	25
5	SONUÇ.....	27

1 GİRİŞ

Bu raporda, WL/Delft Hydraulics, Rotterdamsweg 185 p.o.box. 177, 2600 MH Delft The Netherlands tarafından geliştirilen Wanda 3.60 program paketi kullanılarak K.MARAŞ İÇMESUYU 1.KADEME ve 2.KADEME POMPA İSTASYONU'nda normal işletme ve darbe anında oluşacak hidrolik durum ve özellikle basınçlar incelenecektir.

Telephone +31 15 285 85 35
Telefax +31 15 285 85 82
E-mail wanda.info@wldelft.nl
Internet www.wldelft.nl

Wanda 3.60, hidrolik analizlerde ve tasarımlarda kullanılan gelişmiş interaktif bir program paketidir. Basit şematik diyagramların çiziminden en karışık hidrolik devrelerin sürekli(steady) ve geçici (transit) hallerdeki davranışlarının değerlendirilmesinde Wanda kapsamlı bir tasarım vasıtasıdır:

- Wanda Engineering, her hidrolik sistemin, özellikle pompa istasyonlarının sürekli hallerdeki durum ve davranışlarını değerlendirir.
- Wanda Transient, sistemin normal ve anormal(acil) hallerdeki dinamik davranışını değerlendirir. Program kullanıcıya sürekli ve geçici akış şartları için sistemi simüle etmesini sağlar.

Wanda elemanları ile modelleme (simüle etme) WL/Delft Hydraulic'in Hidrolik Makinalar Laboratuvarındaki ve/veya sahadaki performans testlerine dayanmaktadır.

Simulasyonda kullanılan hidrolik elemanların özeti:

- Boru
- Pompa
- Vana (her çeşit kontrol, çek, relif, vantuz, vs.)
- Hava Kazanı
- Denge Bacası
- Savak
- Rijid kolon
- Reservuar
- Musluk
- Direnç

Her elemanın da ayrıca alt tipleri modellemeyi kolaylaştırmaktadır.

Bir eleman örneği olarak bir pompayı modellemede bir pompa elemanı için aşağıdaki girdi parametreleri programa girmektedir:

- Nominal hız
- Pompa karakteristik eğrisi (Q, H, η , en az beş nokta, nominal hızda)
- İşletme hızı
- Başlangıç ayarı(başlangıç hızı, debisi veya dinamik yüksekliği)
- Polar atalet momenti
- Tahrik tipi(sürekli, ani durma veya hız değişimi)
- Durma süresi
- İsim, açıklama, ana kelime, model gibi tanımlayıcı veya ilave bilgi.

2 SİMULASYON DİYAGRAMLARI VE GİRDİLER

K.MARAŞ İÇMESUYU 1.KADEME ve 2.KADEME POMPA İSTASYONU simülasyon diyagramı, Menzelet barajından başlayarak iletim hattı, emme boruları, bina içi boru vana ve pompalar, basma boru hattı, hava kazanı, terfi deposu arası için Wanda 3.60 elemanları kullanılarak yapılmıştır.

Her elemanın girdi değerleri bu raporun eki olarak verilen input dosyalarında verilmiştir. Bu dosyada kullanılan değerler tamamen proje ve teknik şartnamelerdeki değerlerden alınmıştır. Her bir program işletimi için yapılan girdi değişiklikleri o işletimin input dosyasındaki “Case description” veya “Title” bölümünde açıklanmıştır.

“ trip time” pompanın sürekli halde çalışırken durmaya başladığı andır. İsteğe göre bir değer verilebilir. 0.1 saniye olarak vermekteki gaye bu 0,1 saniye süre içinde normal çalışma değerlerini görmek içindir. “Simulation time” ise darbe olaylarının hesaplandığı zaman süresidir. Zaman aralığı(Time step) seçimi önem arzeder. Büyük aralık hesabı hızlandırır ancak hassasiyet azalır. Küçük aralık seçmenin tersine etkisi vardır.

Bütün diğer girdiler her işletimin input dosyalarında görülebilir. Emniyetli tarafta kalmak için yerel kayıplarda dikkate alınmıştır.

3 ALTERNATİF ÇALIŞMALAR

K.MARAŞ İÇMESUYU 1.KADEME ve 2.KADEME POMPA İSTASYONU'na ait aşağıdaki normal ve darbe hali çalışmaları(run) yapılmıştır.

3.1 K.MARAŞ İÇMESUYU 1.KADEME ve 2.KADEME POMPA İSTASYONU

Ana girdiler:

K.MARAŞ İÇMESUYU 1.KADEME ve 2.KADEME POMPA İSTASYONU pompalarına su, Mezelet Barajından su alan 1500 mm çaplı 527.65 m boyunda çelik boru ve devamındaki 1700 mm çapında boru ile alınmaktadır. 1700 mm çaplı boru km 0+899.49 m de B1 branşman noktasında bitmekte, burada boru iki adet 1100 mm çaplı çelik boruya ayrılmaktadır.1700 mm gelen boru ile aynı yöne devam eden 1100 mm boru 23.15 m sonra 1.Kademe Pompa İstasyonu emme kolektörüne, ayrımda 90 derece dönen 1100 mm boru ise 51.70 m sonra

2.Kademe Pompa İstasyonu emme kolektörüne ulaşmaktadır. Her iki istasyon birbirinin benzeri olup her bir istasyonda üç asıl ve bir yedek pompa bulunmaktadır.

Her bir istasyonda 1100 mm emme kollektöründen ayrılan 4 adet 700 mm çapındaki yatay emme boruları ile su pompalara iletilmektedir. Pompalardan sonra 600 mm basma borusu ilede 1100 mm basma kolektörüne bağlanmaktadır. 1.Kademe pompa istasyonu basma borusu kolektörden sonra 25.38 m de, 2.Kademe pompa istasyonu basma borusu ise kolektörden sonra 49.52 m de BR2 branşman noktasına ulaşmakta ve bu noktada birleşerek 1700 mm çaplı, 17.5 mm kalınlıkta tek çelik boru olarak devam etmektedir. 1700 mm nominal çaplı boruların net iç çapı 1692 mm, 1100 mm nominal çaplı boruların net iç çapı 1100 mm alınmıştır.

Pompa olarak KSB Omega 300-700 A tipi yatay milli çift emişli split pompa özellikleri kullanılmıştır. 1450 rpm pompa karakteristikleri (H, Q, η) eğrilerinin sekiz noktasında girilmiştir. Pompalar değişken devirlidir. Pompalara su emme kollektöründen 700 mm boru ile alınmakta, emme hattında 700 mm lik kelebek izolasyon vanası bulunmaktadır. Pompalardan sonra Φ 600 mm basma borusu, 600 mm çek vanalar ve kelebek vanalar kullanılmıştır. Çek vanalar, hızlı kapanan tipte nozul vana olarak alınmıştır.

Boruların profil verileri, et kalınlığı, uygulama projelerinden ve şartnamelerden alınan değerlerdir. Bu esas girdilerle her çalışmada (işletim-run) değişik ilave girdiler kullanılarak aşağıdaki çalışmalar yapılmıştır:

RUN 3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wdx

Hiçbir su darbesi önlemi alınmamıştır. 1.Kademe pompa istasyonunda 3 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 2.Kademe pompaları çalışmamaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük $K_s=0.15$ mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Örnek olarak bu çalışmanın girdileri EK 1 dosyasının **3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

Bu çalışmanın bazı önemli çıktıları:

Extreme values in pipes:

Head:

Pipe	minimum [m]	time [s]	location [m]	maximum [m]	time [s]	location [m]
1100 B.	534.861	7.800	23.15	611.450	1.800	23.15
BASMA BORUSU-1	544.279	50.430	309.24	795.116	40.080	0.00
BASMA BORUSU-2	605.669	53.700	186.94	748.078	43.950	342.72
BASMA BORUSU-3	615.604	54.210	248.04	743.810	43.770	62.01
KOL15	544.976	49.650	0.00	804.617	16.800	0.00
Mevcut Boru	539.863	3.870	527.65	604.116	1.410	527.65
Yeni Boru	536.921	7.770	317.35	610.260	1.710	317.35
Yeni Boru.a	535.177	7.830	57.50	611.022	1.770	57.50

Pressure:

Pipe	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]	location [m]
1100 B.	-0.921	7.800	23.15	6.592	1.800	23.15
BASMA BORUSU-1	-0.997	5.640	3679.93	25.210	39.300	742.17
BASMA BORUSU-2	-0.997	5.640	0.00	12.939	43.950	311.56
BASMA BORUSU-3	-0.997	5.910	0.00	11.285	43.740	93.01
KOL15	0.071	49.650	0.00	25.542	16.800	0.00
Mevcut Boru	-0.779	3.870	527.65	5.525	1.410	527.65
Yeni Boru	-0.935	7.770	317.35	6.260	1.710	317.35
Yeni Boru.a	-0.935	7.770	0.00	6.556	1.740	28.75

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
BASMA BORUSU-1	0.1058E-01	7.410	3679.93
BASMA BORUSU-2	0.1050E-01	7.410	0.00
BASMA BORUSU-3	0.9441E-02	7.500	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00
Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

1700 mm lik elik basma hattında eksi 1.0 barg eksi basın oluřmaktadırd ve 4 s kadar devamlı srmekte olp tekrarlanmaktadır. Kavitasyon vardır.

Max basınlar ise hat bařında 25.21 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm aplı iletim hattında -0.779 barg, 1700 mm aplı iletim hattında -0.935 barg, eksi basın olmaktadır.

Max basın ise 1700 mm iletim hattında 6.556 barg olmaktadır.

Diğerd basın ve ykseklikler, ekte bu iřletimle aynı isimli ve “wor” uzantılı ıktı dosyalarında grlebilir. (rneğind bu iřletim iin: **3.1.1 K.MARAS 1.KD -NLEMSİZ -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine gre hesaplanan pompa iřletme noktası değerdleri:

$H_m = 104.58 - 104.58$ m

$Q = 500$ l/s

Pompa randımanı $\eta = \% 84.22 - \% 84.22$,

Her bir pompanınd ektiğdi g $P = 609.0 - 609.1$ kW.

Pompa devri: 1316 – 1316 rpm

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **1 500 l/s**

EK 1: (3.1.1 ile bařlayan ekler)

- 1- Simulasyon Diagramı
- 2- Cazibe ve basma hattı piyezometre (Head) ve basın grafiğdi
- 3- Basma hattı km 4+166 m de noktasal basın grafiğdi
- 4- Input dosyası
- 5- Res(output) ıktı dosyası

RUN 3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdx

Hiçbir su darbesi önlemi alınmamıştır. 1.Kademe ve 2.Kademe pompa istasyonunda 6 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 1. Kademe ve 2.Kademe asıl pompaları beraber çalışmaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük $K_s=0.15$ mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 2 dosyasının **3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

Bu çalışmanın bazı önemli çıktıları:

Extreme values in pipes:

Head:

Pipe	minimum [m]	time [s]	location [m]	maximum [m]	time [s]	location [m]
1100 B.	534.088	36.480	23.15	620.054	1.800	23.15
1101	534.088	36.510	25.85	620.211	1.830	51.70
BASMA BORUSU-1	540.733	30.060	711.25	833.536	21.210	154.62
BASMA BORUSU-2	603.430	32.730	280.41	767.824	24.780	155.78
BASMA BORUSU-3	615.604	49.710	248.04	754.837	16.800	558.08
KOL115	539.861	31.830	0.00	838.023	21.420	0.00
KOL15	536.774	30.780	0.00	839.587	21.390	0.00
Mevcut Boru	537.638	36.660	527.65	612.971	1.410	527.65
Yeni Boru	536.288	36.570	317.35	619.636	1.710	317.35
Yeni Boru.a	533.840	52.680	28.75	619.969	1.770	57.50

Pressure:

Pipe	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]	location [m]
1100 B.	-0.997	36.480	23.15	7.436	1.800	23.15
1101	-0.997	36.510	25.85	7.452	1.830	51.70
BASMA BORUSU-1	-0.997	5.550	3679.93	28.627	21.210	154.62
BASMA BORUSU-2	-0.997	5.550	0.00	14.850	24.780	155.78
BASMA BORUSU-3	-0.997	4.920	0.00	12.371	24.240	248.04
KOL115	-0.431	31.830	0.00	28.819	21.420	0.00
KOL15	-0.733	30.780	0.00	28.973	21.390	0.00
Mevcut Boru	-0.997	30.750	62.08	6.393	1.410	527.65
Yeni Boru	-0.997	36.660	0.00	7.180	1.710	317.35
Yeni Boru.a	-0.997	36.570	0.00	7.454	1.740	28.75

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.1138E-03	52.560	23.15
1101	0.1672E-03	48.930	51.70
BASMA BORUSU-1	0.5342E-01	10.080	3679.93
BASMA BORUSU-2	0.5302E-01	10.080	0.00

BASMA BORUSU-3	0.2640E-01	36.600	0.00
KOL115	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.6441E-04	30.690	93.12
Yeni Boru	0.2114E-03	40.770	285.62
Yeni Boru.a	0.1803E-03	52.830	0.00

1700 mm lik çelik basma hattında eksi 1.0 barg eksi basınç oluşmaktadır ve 4 s kadar devamlı sürmekte olup tekrarlanmaktadır. Kavitasyon vardır.

Max basınçlar ise hat başında 24.78 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -1.0 barg, 1700 mm çaplı iletim hattında -1.0 barg, eksi basınç olmaktadır. Kavitasyon vardır.

Max basınç ise 1700 mm iletim hattında 7.454 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve “wor” uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$$H_m = 108.81 - 108.91 \text{ m}$$

$$Q = 500 \text{ l/s}$$

$$\text{Pompa randımanı } \eta = \% 84.33 - \% 84.33,$$

$$\text{Her bir pompanın çektiği güç } P = 632.9 - 633.5 \text{ kW.}$$

$$\text{Pompa devri: } 1336 - 1337 \text{ rpm}$$

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **3 000 l/s**

EK 2: (3.1.2 ile başlayan ekler)

- 1- Simulasyon Diagramı
- 2- Cazibe ve basma hattı piyezometre (Head) ve basınç grafiği
- 3- Basma hattı km 4+166 m de noktasal basınç grafiği
- 4- Input dosyası
- 5- Res(output) çıktı dosyası

RUN 3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17.wdx.

3.1.1 deki şartlara ilaveten aşağıdaki önlemler alınmıştır:

1- 1700 mm iletim hattının sonu km 0+899.49 m ye, BR1 noktasına, bir adet 2.40 m çapında, 6.00 m yüksekliğinde baypassız vantuzlu hava kazanı konmuştur.

Kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Kazan iletim hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bağlantı borusu üzerinde aynı çapta kelebek vana bulunmaktadır. Baypas yoktur. Kazana 546.80 m kotuna iki adet 100 mm lik vantuz takılacak ve kazanda su seviyesi bu kotun üzerine çıkınca kazan içindeki hava kazan içine hapsedilecektir. Kazan su seviyesi 546.80 m kotu altına düşünce dışarıdan kazana hava girebilecektir.

2- 1700 mm çaplı basma hattının km 0+023.45 m ye, BR2 noktasına, bir adet 27 m³ lük kompresörlü baypaslı hava kazanı konmuştur. Kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Kazan basma hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bu hat üzerinde aynı çapta izolasyon kelebek vanası ve çekvalf vardır. Çek valf hızlı kapanan tipte ve suyu kazandan cebri boruya geçirecek yöndedir. Baypas hattının çapı 150 mm olup bu hat üzerindeki 150 mm lik sürgülü baypas vanası % 50 açıktır. Hava kazanının başlangıç hava hacmi 13.00 m³ tür.

1.Kademe pompa istasyonunda 3 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 2.Kademe pompaları çalışmamaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)dir**. Çelik borularda pürüzlülük $K_s=0.15$ mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 3 dosyasının **3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

Bu çalışmanın bazı önemli çıktıları:

Extreme values in pipes:

Head:

Pipe	minimum [m]	time [s]	location [m]	maximum [m]	time [s]	location [m]
1100 B.	549.777	20.100	23.15	583.680	6.240	23.15
BASMA BORUSU-1	606.202	11.880	30.92	701.660	22.920	0.00
BASMA BORUSU-2	629.142	7.500	0.00	680.257	19.320	0.00
BASMA BORUSU-3	634.259	7.050	0.00	677.147	18.870	0.00
KOL15	602.972	11.820	0.00	705.552	22.920	0.00
Mevcut Boru	550.226	1.710	186.23	579.723	6.360	527.65
Yeni Boru	549.134	20.190	190.41	584.491	6.390	253.88

Yeni Boru.a	549.599	22.170	0.00	583.923	6.330	0.00

Pressure:

Pipe	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]	location [m]
1100 B.	0.542	20.100	23.15	3.868	6.240	23.15
BASMA BORUSU-1	0.896	7.500	3679.93	16.777	23.820	896.79
BASMA BORUSU-2	0.400	7.050	467.34	6.364	19.050	280.41
BASMA BORUSU-3	-0.047	17.310	1488.22	4.852	18.630	248.04
KOL15	5.761	11.820	0.00	15.824	22.920	0.00
Mevcut Boru	0.087	1.650	124.15	3.132	6.360	527.65
Yeni Boru	0.188	22.110	126.94	3.705	6.390	253.88
Yeni Boru.a	0.309	22.170	0.00	3.842	6.300	28.75

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
BASMA BORUSU-1	0.000	0.000	0.00
BASMA BORUSU-2	0.000	0.000	0.00
BASMA BORUSU-3	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00
Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

1700 mm lik çelik basma hattında eksi -0.047 barg eksi basınç dışında eksi basınç kalmamıştır. Bu eksi basınç sadece bir defa 0.02 s kadar devamlı sürmekte olup tekrarlanmamaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 16.777 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında ve 1700 mm çaplı iletim hattında eksi basınç olmamaktadır.

Max basınç ise 1700 mm iletim hattında 3.842 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve “wor” uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$H_m = 104.58 - 104.58$ m

$Q = 500$ l/s

Pompa randımanı $\eta = \% 84.22 - \% 84.22$,

Her bir pompanın çektiği güç $P = 609.0 - 609.1$ kW.

Pompa devri: 1316 – 1316 rpm

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**
Basılan toplam debi : **1 500 l/s**

EK 3: (3.1.3 ile başlayan ekler)

- 1- Simulasyon Diagramı
- 2- Cazibe ve basma hattı piyezometre (Head) grafiği
- 3- Cazibe ve basma hattı basınç grafiği
- 4- Basma hattı km 5+553 de noktasal basınç
- 5- Kazanların su seviyesi, hava basıncı ve hava hacmi
- 6- Input dosyası
- 7- Res(output) çıktı dosyası

RUN 3.1.4 K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wdx

3.1.2 deki şartlara ilaveten aşağıdaki önlemler alınmıştır:

1- 1700 mm iletim hattının sonu km 0+899.49 m ye, BR1 noktasına, iki adet 2.40 m çapında, 6.00 m yüksekliğinde baypassız vantuzlu hava kazanı konmuştur.

Her bir kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan iletim hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bağlantı borusu üzerinde aynı çapta kelebek vana bulunmaktadır. Baypas yoktur. Kazana 546.80 m kotuna iki adet 100 mm lik vantuz takılacak ve kazanda su seviyesi bu kotun üzerine çıkınca kazan içindeki hava kazan içine hapsedilecektir. Kazan su seviyesi 546.80 m kotu altına düşünce dışarıdan kazana hava girebilecektir.

2- 1700 mm çaplı basma hattının km 0+023.45 m ye, BR2 noktasına, iki adet 27 m³ lük kompresörlü baypaslı hava kazanı konmuştur. Kazanların silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan basma hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bu hat üzerinde aynı çapta izolasyon kelebek vanası ve çekvalf vardır. Çek valf hızlı kapanan tipte ve suyu kazandan cebri boruya geçirecek yöndedir. Baypas hattının çapı 150 mm olup bu hat üzerindeki 150 mm lik sürgülü baypas vanası % 50 açıktır. Her bir hava kazanının başlangıç hava hacmi 13.00 m³ tür.

.Kademe ve 2.Kademe pompa istasyonunda 6 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 1. Kademe ve 2.Kademe asıl pompaları beraber çalışmaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük Ks=0.15 mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 4 dosyasının **3.1.4 K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

Bu çalışmanın bazı önemli çıktıları:

Extreme values in pipes:

Head:

Pipe	minimum [m]	time [s]	location [m]	maximum [m]	time [s]	location [m]
1100 B.	547.204	28.410	23.15	594.556	8.070	23.15
1101	546.083	29.670	51.70	596.714	8.010	51.70
BASMA BORUSU-1	591.651	11.910	92.77	693.477	27.030	0.00
BASMA BORUSU-2	623.749	18.240	0.00	684.485	29.430	0.00
BASMA BORUSU-3	628.820	18.090	0.00	681.234	29.220	0.00
KOL115	590.217	12.030	0.00	693.490	27.120	0.00
KOL15	592.354	11.910	0.00	693.494	27.030	0.00
Mevcut Boru	547.034	1.680	155.19	589.630	8.010	527.65
Yeni Boru	546.500	26.760	190.41	596.038	8.010	222.15

Yeni Boru.a	547.009	28.620	0.00	595.191	8.130	0.00
Pressure:						
Pipe	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]	location [m]
1100 B.	0.290	28.410	23.15	4.935	8.070	23.15
1101	0.180	29.670	51.70	5.147	8.010	51.70
BASMA BORUSU-1	0.367	18.240	3679.93	16.669	27.450	896.79
BASMA BORUSU-2	-0.133	18.090	467.34	6.810	29.400	280.41
BASMA BORUSU-3	-0.133	18.090	0.00	5.192	30.000	248.04
KOL115	4.509	12.030	0.00	14.640	27.120	0.00
KOL15	4.719	11.910	0.00	14.641	27.030	0.00
Mevcut Boru	-0.227	1.680	155.19	4.104	8.010	527.65
Yeni Boru	-0.061	26.700	126.94	4.825	8.010	222.15
Yeni Boru.a	0.055	28.620	0.00	5.037	8.130	28.75

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
1101	0.000	0.000	0.00
BASMA BORUSU-1	0.000	0.000	0.00
BASMA BORUSU-2	0.000	0.000	0.00
BASMA BORUSU-3	0.000	0.000	0.00
KOL115	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00
Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

1700 mm lik çelik basma hattında eksi 0.133 barg dışında eksi basınç oluşmamaktadır.Bu eksi basınç 0.04 s sürmekte olup azalan bir tekrardan sonra yok olmaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 16.669 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -0.227 barg, 1700 mm çaplı iletim hattında -0.061 barg, eksi basınç kalmıştır. Kavitasyon yoktur. -0.227 barg lik basınç 0.06 s sürüp tekrarlanmamaktadır.

Max basınç ise 1700 mm iletim hattında 5.037 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve “wor” uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.4 K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$$H_m = 108.81 - 108.91 \text{ m}$$

$$Q = 500 \text{ l/s}$$

$$\text{Pompa randımanı } \eta = \% 84.33 - \% 84.33,$$

$$\text{Her bir pompanın çektiği güç } P = 632.9 - 633.5 \text{ kW.}$$

Pompa devri: 1336 – 1337 rpm

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **3 000 l/s**

EK 4: (3.1.4 ile başlayan ekler)

- 1- Simulasyon Diagramı
- 2- Cazibe ve basma hattı piyezometre (Head) grafiği
- 3- Cazibe ve basma hattı basınç grafiği
- 4- Basma hattı km 5+553 de noktasal basınç
- 5- Kazanların su seviyesi, hava basıncı ve hava hacmi
- 6- Input dosyası
- 7- Res(output) çıktı dosyası

RUN 3.1.5 K.MARAS 1.KD+2.KD –KAZANLI-Min Hm-03 JUL 17.wdx

3.1.4 deki aynı önlemler alınmış olup sadece barajda su seviyesi max dur.

Yine aynı aşağıdaki önlemler alınmıştır.

1- 1700 mm iletim hattının sonu km 0+899.49 m ye, BR1 noktasına, iki adet 2.40 m çapında, 6.00 m yüksekliğinde baypassız vantuzlu hava kazanı konmuştur.

Her bir kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan iletim hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bağlantı borusu üzerinde aynı çapta kelebek vana bulunmaktadır. Baypas yoktur. Kazana 546.80 m kotuna iki adet 100 mm lik vantuz takılacak ve kazanda su seviyesi bu kotun üzerine çıkınca kazan içindeki hava kazan içine hapsedilecektir. Kazan su seviyesi 546.80 m kotu altına düşünce dışarıdan kazana hava girebilecektir.

2- 1700 mm çaplı basma hattının km 0+023.45 m ye, BR2 noktasına, iki adet 27 m³ lük kompresörlü baypaslı hava kazanı konmuştur. Kazanların silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan basma hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bu hat üzerinde aynı çapta izolasyon kelebek vanası ve çekvalf vardır. Çek valf hızlı kapanan tipte ve suyu kazandan cebri boruya geçirecek yöndedir. Baypas hattının çapı 150 mm olup bu hat üzerindeki 150 mm lik sürgülü baypas vanası % 50 açıktır. Her bir hava kazanının başlangıç hava hacmi 13.00 m³ tür.

.Kademe ve 2.Kademe pompa istasyonunda 6 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 1. Kademe ve 2.Kademe asıl pompaları beraber çalışmaktadır. Menzelet Barajında su seviyesi **609.00 m (Max SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük Ks=0.15 mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 5 dosyasının **3.1.5 K.MARAS 1.KD+2.KD –KAZANLI-Min Hm-03 JUL 177.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

Bu çalışmanın bazı önemli çıktıları:

Extreme values in pipes:

Head:

Pipe	minimum [m]	time [s]	location [m]	maximum [m]	time [s]	location [m]
1100 B.	596.643	12.150	23.15	657.723	2.580	0.00
1101	596.446	12.180	51.70	657.728	2.580	0.00
BASMA BORUSU-1	599.217	14.940	0.00	683.252	33.420	61.85
BASMA BORUSU-2	633.642	18.540	0.00	676.253	29.910	0.00
BASMA BORUSU-3	638.053	18.090	0.00	673.771	29.460	0.00
KOL115	599.005	13.200	0.00	683.522	33.540	0.00

KOL15	599.217	14.940	25.38	683.345	33.480	0.00
Mevcut Boru	597.347	12.270	527.65	646.798	2.520	527.65
Yeni Boru	596.389	12.060	285.62	656.703	2.580	317.35
Yeni Boru.a	596.397	12.060	0.00	657.738	2.580	57.50

Pressure:

Pipe	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]	location [m]
1100 B.	5.140	12.150	23.15	11.132	2.580	0.00
1101	5.120	12.180	51.70	11.132	2.580	0.00
BASMA BORUSU-1	1.337	18.540	3679.93	15.567	32.610	896.79
BASMA BORUSU-2	0.772	18.090	467.34	6.010	29.640	280.41
BASMA BORUSU-3	0.166	5.610	1488.22	4.548	29.220	248.04
KOL115	5.371	13.200	0.00	13.663	33.540	0.00
KOL15	5.392	14.940	25.38	13.645	33.480	0.00
Mevcut Boru	4.861	12.270	527.65	9.712	2.520	527.65
Yeni Boru	4.843	12.150	158.68	10.816	2.580	317.35
Yeni Boru.a	4.900	12.060	0.00	11.133	2.580	57.50

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
1101	0.000	0.000	0.00
BASMA BORUSU-1	0.000	0.000	0.00
BASMA BORUSU-2	0.000	0.000	0.00
BASMA BORUSU-3	0.000	0.000	0.00
KOL115	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00
Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

1700 mm lik çelik basma hattında hiç eksi basınç oluşmamaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 15.5679 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında ve 1700 mm çaplı iletim hattında hiç eksi basınç kalmamıştır. Kavitasyon yoktur.

Max basınç ise 1700 mm iletim hattında 11.133 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve "wor" uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.5 K.MARAS 1.KD+2.KD -KAZANLI –Min Hm-03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$H_m = 59.81 - 59.91 \text{ m}$

$Q = 500 \text{ l/s}$

Pompa randımanı $\eta = \% 76.87 - \% 76.90$,

Her bir pompanın çektiği güç $P = 381.7 - 382.2 \text{ kW}$.

Pompa devri: 1084 – 1085 rpm

Menzelet Barajı Su Seviyesi : **609.00 m (Max SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **3 000 l/s**

EK 5: (3.1.5 ile başlayan ekler)

- 1- Simulasyon Diagramı
- 2- Cazibe ve basma hattı piyezometre (Head) grafiği
- 3- Cazibe ve basma hattı basınç grafiği
- 4- Kazanların su seviyesi, hava basıncı ve hava hacmi
- 5- Input dosyası
- 6- Res(output) çıktı dosyası

4 HESAP SONUÇLARININ DEĞERLENDİRİLMESİ

4.1 RUN 3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wdx

Hiçbir su darbesi önlemi alınmamıştır. 1.Kademe pompa istasyonunda 3 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 2.Kademe pompaları çalışmamaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük $K_s=0.15$ mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ektteki girdi dosyalarında verilmiştir. Örnek olarak bu çalışmanın girdileri EK 1 dosyasının **3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

Hiç bir önlem alınmadığı takdirde bu işletimde olduğu gibi darbe anında 1700 mm lik çelik basma hattında eksi 1.0 barg eksi basınç oluşmaktadır ve 4 s kadar devamlı sürmekte olup tekrarlanmaktadır. Kavitasyon vardır.

Max basınçlar ise hat başında 25.21 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -0.779 barg, 1700 mm çaplı iletim hattında -0.935 barg, eksi basınç olmaktadır.

Max basınç ise 1700 mm iletim hattında 6.556 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve “wor” uzantılı çıktı dosyalarında görülebilir. (Örneğin bu işletim için: **3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$$H_m = 104.58 - 104.58 \text{ m}$$

$$Q = 500 \text{ l/s}$$

$$\text{Pompa randımanı } \eta = \% 84.22 - \% 84.22,$$

$$\text{Her bir pompanın çektiği güç } P = 609.0 - 609.1 \text{ kW.}$$

$$\text{Pompa devri: } 1316 - 1316 \text{ rpm}$$

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **1 500 l/s**

4.2 RUN 3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdx

Hiçbir su darbesi önlemi alınmamıştır. 1.Kademe ve 2.Kademe pompa istasyonunda 6 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 1. Kademe ve 2.Kademe asıl pompaları beraber çalışmaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük $K_s=0.15$ mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 2 dosyasının **3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

1700 mm lik çelik basma hattında eksi 1.0 barg eksi basınç oluşmaktadır ve 4 s kadar devamlı sürmekte olup tekrarlanmaktadır. Kaviteasyon vardır.

Max basınçlar ise hat başında 24.78 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -1.0 barg, 1700 mm çaplı iletim hattında -1.0 barg, eksi basınç olmaktadır. Kaviteasyon vardır.

Max basınç ise 1700 mm iletim hattında 7.454 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve “wor” uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$$H_m = 108.81 - 108.91 \text{ m}$$

$$Q = 500 \text{ l/s}$$

$$\text{Pompa randımanı } \eta = \% 84.33 - \% 84.33,$$

$$\text{Her bir pompanın çektiği güç } P = 632.9 - 633.5 \text{ kW.}$$

$$\text{Pompa devri: } 1336 - 1337 \text{ rpm}$$

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **3 000 l/s**

4.3 RUN 3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17.wdx

3.1.1 deki şartlara ilaveten aşağıdaki önlemler alınmıştır:

1- 1700 mm iletim hattının sonu km 0+899.49 m ye, BR1 noktasına, bir adet 2.40 m çapında, 6.00 m yüksekliğinde baypassız vantuzlu hava kazanı konmuştur.

Kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Kazan iletim hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bağlantı borusu üzerinde aynı çapta kelebek vana bulunmaktadır. Baypas yoktur. Kazana 546.80 m kotuna iki adet 100 mm lik vantuz takılacak ve kazanda su seviyesi bu kotun üzerine çıkınca kazan içindeki hava kazan içine hapsedilecektir. Kazan su seviyesi 546.80 m kotu altına düşünce dışarıdan kazana hava girebilecektir.

2- 1700 mm çaplı basma hattının km 0+023.45 m ye, BR2 noktasına, bir adet 27 m³ lük kompresörlü baypaslı hava kazanı konmuştur. Kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Kazan basma hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bu hat üzerinde aynı çapta izolasyon kelebek vanası ve çekvalf vardır. Çek valf hızlı kapanan tipte ve suyu kazandan cebri boruya geçirecek yöndedir. Baypas hattının çapı 150 mm olup bu hat üzerindeki 150 mm lik sürgülü baypas vanası % 50 açıktır. Hava kazanının başlangıç hava hacmi 13.00 m³ tür.

1.Kademe pompa istasyonunda 3 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 2.Kademe pompaları çalışmamaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük Ks=0.15 mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 3 dosyasının **3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

1700 mm lik çelik basma hattında eksi -0.047 barg eksi basınç dışında eksi basınç kalmamıştır. Bu eksi basınç sadece bir defa 0.02 s kadar devamlı sürmekte olup tekrarlanmamaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 16.777 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında ve 1700 mm çaplı iletim hattında eksi basınç olmamaktadır.

Max basınç ise 1700 mm iletim hattında 3.842 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve "wor" uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$H_m = 104.58 - 104.58 \text{ m}$

$Q = 500 \text{ l/s}$

Pompa randımanı $\eta = \% 84.22 - \% 84.22$,

Her bir pompanın çektiği güç $P = 609.0 - 609.1 \text{ kW}$.

Pompa devri: $1316 - 1316 \text{ rpm}$

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **1 500 l/s**

4.4 RUN 3.1.4 K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wdx

3.1.2 deki şartlara ilaveten aşağıdaki önlemler alınmıştır:

1- 1700 mm iletim hattının sonu km 0+899.49 m ye, BR1 noktasına, iki adet 2.40 m çapında, 6.00 m yüksekliğinde baypassız vantuzlu hava kazanı konmuştur.

Her bir kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan iletim hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bağlantı borusu üzerinde aynı çapta kelebek vana bulunmaktadır. Baypas yoktur. Kazana 546.80 m kotuna iki adet 100 mm lik vantuz takılacak ve kazanda su seviyesi bu kotun üzerine çıkınca kazan içindeki hava kazan içine hapsedilecektir. Kazan su seviyesi 546.80 m kotu altına düşünce dışarıdan kazana hava girebilecektir.

2- 1700 mm çaplı basma hattının km 0+023.45 m ye, BR2 noktasına, iki adet 27 m³ lük kompresörlü baypaslı hava kazanı konmuştur. Kazanların silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan basma hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bu hat üzerinde aynı çapta izolasyon kelebek vanası ve çekvalf vardır. Çek valf hızlı kapanan tipte ve suyu kazandan cebri boruya geçirecek yöndedir. Baypas hattının çapı 150 mm olup bu hat üzerindeki 150 mm lik sürgülü baypas vanası % 50 açıktır. Her bir hava kazanının başlangıç hava hacmi 13.00 m³ tür.

.Kademe ve 2.Kademe pompa istasyonunda 6 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 1. Kademe ve 2.Kademe asıl pompaları beraber çalışmaktadır. Menzelet Barajında su seviyesi **560.00 m (Min SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük Ks=0.15 mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 4 dosyasının **3.1.4 K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

1700 mm lik çelik basma hattında eksi 0.133 barg dışında eksi basınç oluşmamaktadır.Bu eksi basınç 0.04 s sürmekte olup azalan bir tekrardan sonra yok olmaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 16.669 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -0.227 barg, 1700 mm çaplı iletim hattında -0.061 barg, eksi basınç kalmıştır. Kavitasyon yoktur. -0.227 barg lik basınç 0.06 s sürüp tekrarlanmamaktadır.

Max basınç ise 1700 mm iletim hattında 5.037 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve “wor” uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.4 K.MARAS 1.KD+2.KD -KAZANLI -03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$H_m = 108.81 - 108.91 \text{ m}$

$Q = 500 \text{ l/s}$

Pompa randımanı $\eta = \% 84.33 - \% 84.33$,

Her bir pompanın çektiği güç $P = 632.9 - 633.5 \text{ kW}$.

Pompa devri: $1336 - 1337 \text{ rpm}$

Menzelet Barajı Su Seviyesi : **560.00 m (Min SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **3 000 l/s**

4.5 RUN 3.1.5 K.MARAS 1.KD+2.KD –KAZANLI-Min Hm -03 JUL 17.wdx

3.1.4 deki aynı önlemler alınmış olup sadece barajda su seviyesi max dur.

Yine aynı aşağıdaki önlemler alınmıştır.

1- 1700 mm iletim hattının sonu km 0+899.49 m ye, BR1 noktasına, iki adet 2.40 m çapında, 6.00 m yüksekliğinde baypassız vantuzlu hava kazanı konmuştur.

Her bir kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan iletim hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bağlantı borusu üzerinde aynı çapta kelebek vana bulunmaktadır. Baypas yoktur. Kazana 546.80 m kotuna iki adet 100 mm lik vantuz takılacak ve kazanda su seviyesi bu kotun üzerine çıkınca kazan içindeki hava kazan içine hapsedilecektir. Kazan su seviyesi 546.80 m kotu altına düşünce dışarıdan kazana hava girebilecektir.

2- 1700 mm çaplı basma hattının km 0+023.45 m ye, BR2 noktasına, iki adet 27 m³ lük kompresörlü baypaslı hava kazanı konmuştur. Kazanların silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Her bir kazan basma hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bu hat üzerinde aynı çapta izolasyon kelebek vanası ve çekvalf vardır. Çek valf hızlı kapanan tipte ve suyu kazandan cebri boruya geçirecek yöndedir. Baypas hattının çapı 150 mm olup bu hat üzerindeki 150 mm lik sürgülü baypas vanası % 50 açıktır. Her bir hava kazanının başlangıç hava hacmi 13.00 m³ tür.

.Kademe ve 2.Kademe pompa istasyonunda 6 asıl pompa max proje debisini basarken aynı anda durdurulmuştur.(Ani ceryan kesilmesi hali) Bu çalışmada 1. Kademe ve 2.Kademe asıl pompaları beraber çalışmaktadır. Menzelet Barajında su seviyesi **609.00 m (Max SS)** basma havuzu su seviyesi ise **662.00 m (Max SS)**dir. Çelik borularda pürüzlülük $K_s=0.15$ mm alınmıştır. Bütün girdi değerleri bu çalışma ile aynı ön isimli ekteki girdi dosyalarında verilmiştir. Bu çalışmanın girdileri EK 5 dosyasının **3.1.5 K.MARAS 1.KD+2.KD –KAZANLI-Min Hm-03 JUL 177.wir** dosyasındadır. Dosya isimlerinin başında da aynı indeksleme sayısı vardır.

Bu girdilerle Wanda 3.60 Programı çalıştırılmış ve normal ve darbe hali sonuçları aynı ön isimli wor diye biten çıktı dosyalarında verilmiştir.

1700 mm lik çelik basma hattında hiç eksi basınç oluşmamaktadır. Kaviteasyon yoktur.

Max basınçlar ise hat başında 15.5679 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında ve 1700 mm çaplı iletim hattında hiç eksi basınç kalmamıştır. Kaviteasyon yoktur.

Max basınç ise 1700 mm iletim hattında 11.133 barg olmaktadır.

Diğer basınç ve yükseklikler, ekte bu işletimle aynı isimli ve “wor” uzantılı çıktı dosyalarında görülebilir. (Bu işletim için: **3.1.5 K.MARAS 1.KD+2.KD -KAZANLI –Min Hm-03 JUL 17.wor**).

Kullanılan pompa karakteristiklerine göre hesaplanan pompa işletme noktası değerleri:

$H_m = 59.81 - 59.91$ m

$Q = 500$ l/s

Pompa randımanı $\eta = \% 76.87 - \% 76.90$,

Her bir pompanın çektiği güç $P = 381.7 - 382.2$ kW.

Pompa devri: 1084 – 1085 rpm

Menzelet Barajı Su Seviyesi : **609.00 m (Max SS)**

Basma havuzu su seviyesi : **662.00 m (Max SS)**

Basılan toplam debi : **3 000 l/s**

5 SONUÇ

Yukarıdaki hesaplardan görüleceği gibi sistemde önlem alınmadığı takdirde 3.1.1 deki gibi sadece 1.Kademedeki 3 asıl pompa çalışırken pompalar aniden durursa:

1700 mm lik çelik basma hattında eksi 1.0 barg eksi basınç oluşmaktadır ve 4 s kadar devamlı sürmekte olup tekrarlanmaktadır. Kavitasyon vardır.

Max basınçlar ise hat başında 25.21 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -0.779 barg, 1700 mm çaplı iletim hattında -0.935 barg, eksi basınç olmaktadır.

Max basınç ise 1700 mm iletim hattında 6.556 barg olmaktadır.

3.1.2 deki gibi önlem yoksa 1.Kademedeki 3 asıl pompa ve 2. Kademedeki 3 asıl pompa beraber çalışırken pompalar aniden durursa:

1700 mm lik çelik basma hattında eksi 1.0 barg eksi basınç oluşmaktadır ve 4 s kadar devamlı sürmekte olup tekrarlanmaktadır. Kavitasyon vardır.

Max basınçlar ise hat başında 24.78 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -1.0 barg, 1700 mm çaplı iletim hattında -1.0 barg, eksi basınç olmaktadır. Kavitasyon vardır.

Max basınç ise 1700 mm iletim hattında 7.454 barg olmaktadır.

3.1.3 deki önlemlerle (İletim sonuna ve basma hattı başına birer adet 27 m³ kazan konulursa) ve Max Hm şartlarında sadece 1.Kademedeki 3 asıl pompa çalışırken pompalar aniden durursa:

1700 mm lik çelik basma hattında eksi -0.047 barg eksi basınç dışında eksi basıncı kalmamıştır. Bu eksi basınç sadece bir defa 0.02 s kadar devamlı sürmekte olup tekrarlanmamaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 16.777 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında ve 1700 mm çaplı iletim hattında eksi basınç olmamaktadır.

Max basınç ise 1700 mm iletim hattında 3.842 barg olmaktadır.

3.1.4 deki önlemlerle (İletim sonuna ve basma hattı başına birer adet 27 m³ kazan konulursa) ve Max Hm şartlarında 1.Kademedeki 3 asıl pompa ve 2.Kademedeki 3 asıl pompa beraber çalışırken pompalar aniden durursa:

1700 mm lik çelik basma hattında eksi 0.133 barg dışında eksi basınç oluşmamaktadır.Bu eksi basınç 0.04 s sürmekte olup azalan bir tekrardan sonra yok olmaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 16.669 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında -0.227 barg, 1700 mm çaplı iletim hattında -0.061 barg, eksi basınç kalmıştır. Kavitasyon yoktur. -0.227 barg lik basınç 0.06 s sürüp tekrarlanmamaktadır.

Max basınç ise 1700 mm iletim hattında 5.037 barg olmaktadır.

3.1.5 deki önlemlerle (İletim sonuna ve basma hattı başına birer adet 27 m³ kazan konulursa) ve Min Hm şartlarında 1.Kademedeki 3 asıl pompa ve 2.Kademedeki 3 asıl pompa beraber çalışırken pompalar aniden durursa:

1700 mm lik çelik basma hattında hiç eksi basınç oluşmamaktadır. Kavitasyon yoktur.

Max basınçlar ise hat başında 15.5679 barg kadar olmaktadır.

Cazibe hatlarında:

1500 mm çaplı iletim hattında ve 1700 mm çaplı iletim hattında hiç eksi basınç kalmamıştır. Kavitasyon yoktur.

Max basınç ise 1700 mm iletim hattında 11.133 barg olmaktadır.

Sonuç olarak yukarda 3.1.3 ve 3.1.4 de tariflenen kazanlar, iletim ve basma hattındaki max darbe basınçlarını azaltmakta ve eksi basınçları ve kavitasyonları önlemektedir.

Alınacak önlemler:

Sadece 1.Kademedeki 3 asıl pompa için:

- 1- 1700 mm iletim hattının sonu km 0+899.49 m ye, BR1 noktasına, bir adet 2.40 m çapında, 6.00 m yüksekliğinde baypassız vantuzlu hava kazanı konacaktır.

Kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç çapı 2.40 m dir. Kazan iletim hattına 600 mm lik bağlantı borusu ile bağlanacaktır. Bağlantı borusu üzerinde aynı çapta kelebek vana bulunmaktadır. Baypas yoktur. Kazana 546.80 m kotuna iki adet 100 mm lik vantuz takılacak ve kazanda su seviyesi bu kotun üzerine çıkınca kazan içindeki hava kazan içine hapsedilecektir. Kazan su seviyesi 546.80 m kotu altına düşünce dışarıdan kazana hava girebilecektir.

Kazandaki hava miktarı azalınca kazana hava vermek için kazan izolasyon vanası kapatılacak,(Kazan devre dışı iken yani izolasyon vanası kapalı iken pompalar çalıştırılmayacaktır.) tahliye vanası açılarak kazandaki su seviyesi 546.80 seviyesi altına indirilecek ve vantuzdan kazana

hava giriři saęlanacaktır. Hava giriři durunca tahliye kapatılacak, izolasyon vanası yavaş yavaş açılarak kazana su verilecektir.

Kazan max hava basıncı 11.7 barg dir.

2-1700 mm aplı basma hattının km 0+023.45 m ye, BR2 noktasına, bir adet 27 m³ lük kompresörlü baypaslı hava kazanı konmuřtur. Kazanın silindirik kısmının alt kotu 546.55 m, üst kotu 552.55 m ve net iç apı 2.40 m dir. Kazan basma hattına 600 mm lik baęlantı borusu ile baęlanacaktır. Bu hat üzerinde aynı apta izolasyon kelebek vanası ve çekvalf vardır. Çek valf hızlı kapanan tipte ve suyu kazandan cebri boruya geçirecek yöndedir. Baypas hattının apı 150 mm olup bu hat üzerindeki 150 mm lik sürgülü baypas vanası % 50 açıktır. Hava kazanının başlangıç hava hacmi 13.00 m³ tür.

Kazan max hava basıncı 11.5 barg dir.

Kazanı 1 saatte dolduracak kompresör 2.70 m³/dakka serbest hava kapasiteli ve min 12.5 barg basın klasında olacaktır. Doldurma süresi deęiřtike kompresör kapasitesi ters orantılı olarak deęiřecektir.

Bir pompanın ektięi max gü:633.5 kW.

% 10 tolerans ile motor gücü:

$$633.5 \times 1.1 = 696.85 \text{ kW}$$

Standard 710 kW motor kullanılabilir. Ancak uygulama esnasında alınacak pompa özelliklerine göre tekrar tetkik edilmelidir.

İlerde uygulamada debi, basma yükseklięi, pompa, motor veya boru gibi önemli parametrelerde deęiřiklik olursa yeniden bir benzer hidrolik alıřma yapılmalıdır.

Pompaların ektięi toplam gü:

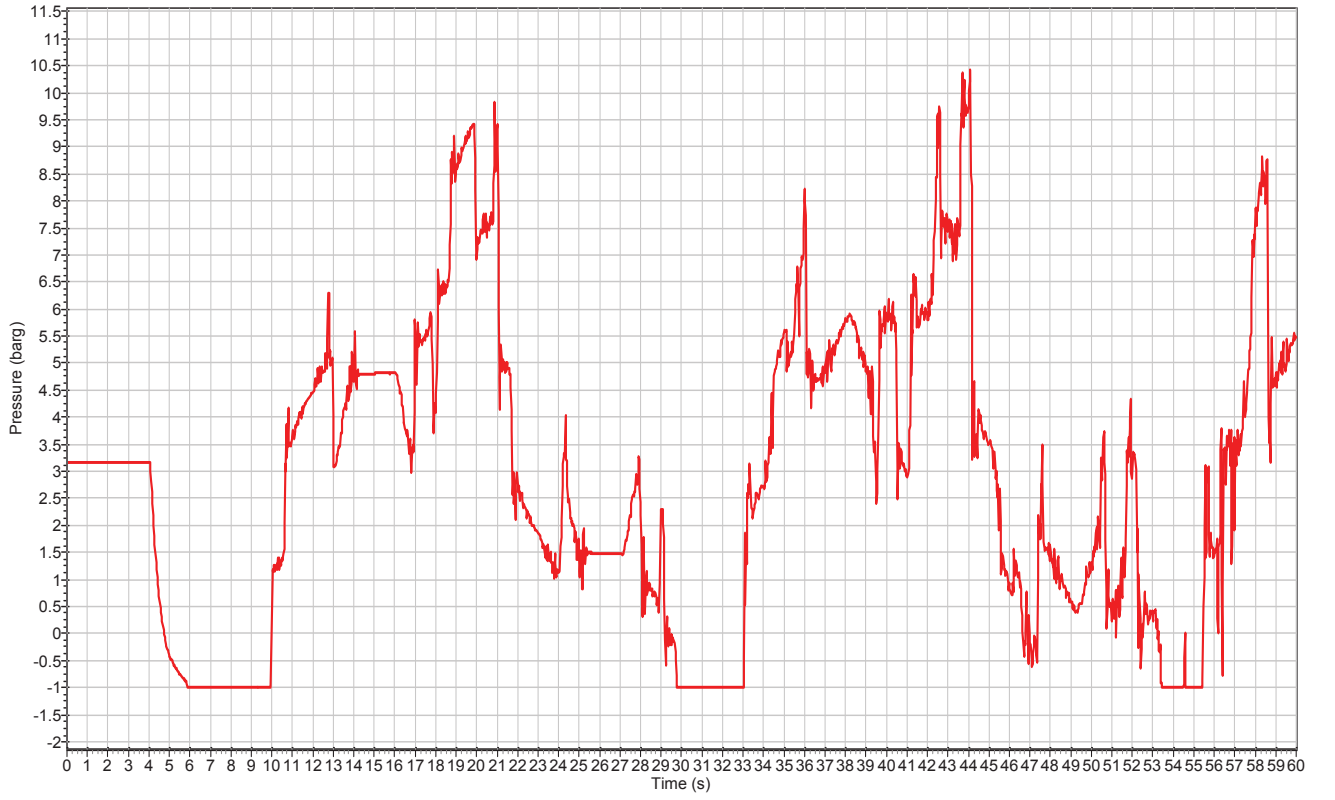
$$632.9 + 633.0 + 632.9 + 633.4 + 633.5 + 633.4 = 3799.1 \text{ kW tır.}$$

Bu deęer motorların randımanına bölünürse trafodan ekilen gü bulunacaktır. Varsa dięer ilave güler, örneęin iç ihtiyaç ta aynı trafodan besleniyorsa, trafo gücü tayin edilirken bu güce ilave edilecektir.

Pompalar min su alma seviyesinin en az 14.0 metre altında olduęu için mevcut NPSH 23 metre üzeri olmaktadır. Gerekli NPSH deęeri 5.00 metre civarı olduęu için kavitasyon problemi yoktur.

Bu hesapların neticeleri herbir iřletim için girilen girdilere baęlıdır. Eęer gerek řartlar hesaplara girilen deęerlerden farklı ise gerek neticeler de farklı olacaktır. Özellikle hattın içinden geen toplam debi (alıřan pompaların bastıęı debi toplamı) hesaplardaki hat max debisini gememelidir, řayet geerse bu hesaplar bu durumda geerli deęildir. Bu nedenle hesaplarda kullanılan daha fazla debi verecek daha büyük ve kapasiteli pompaların veya girdilerdekinden daha fazla sayıda pompanın kullanımından kaçınılmalıdır. Özet olarak bu hesapların doęruluęu sadece her iřletimde kullanılan girdi deęerleri ve o iřletim řartları için geerlidir.

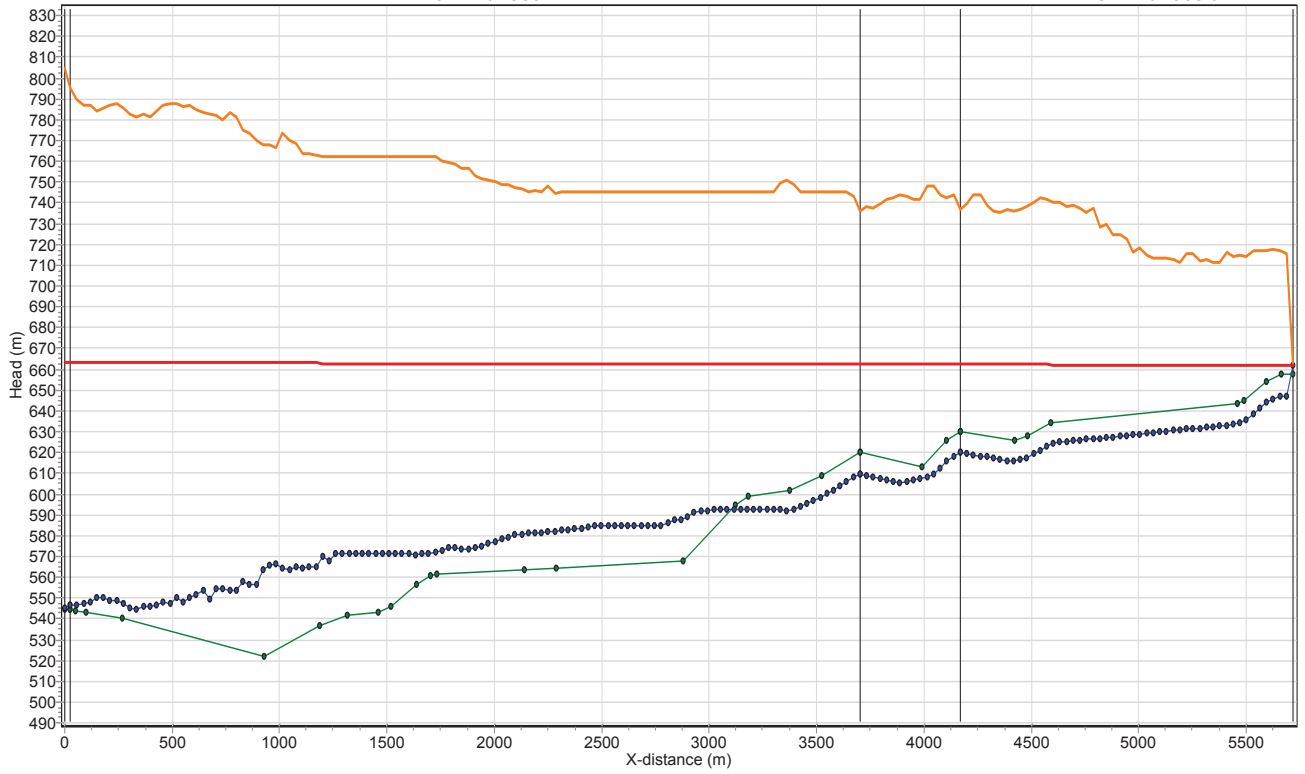
3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17



— Pressure H-node BE (MARAS IS)

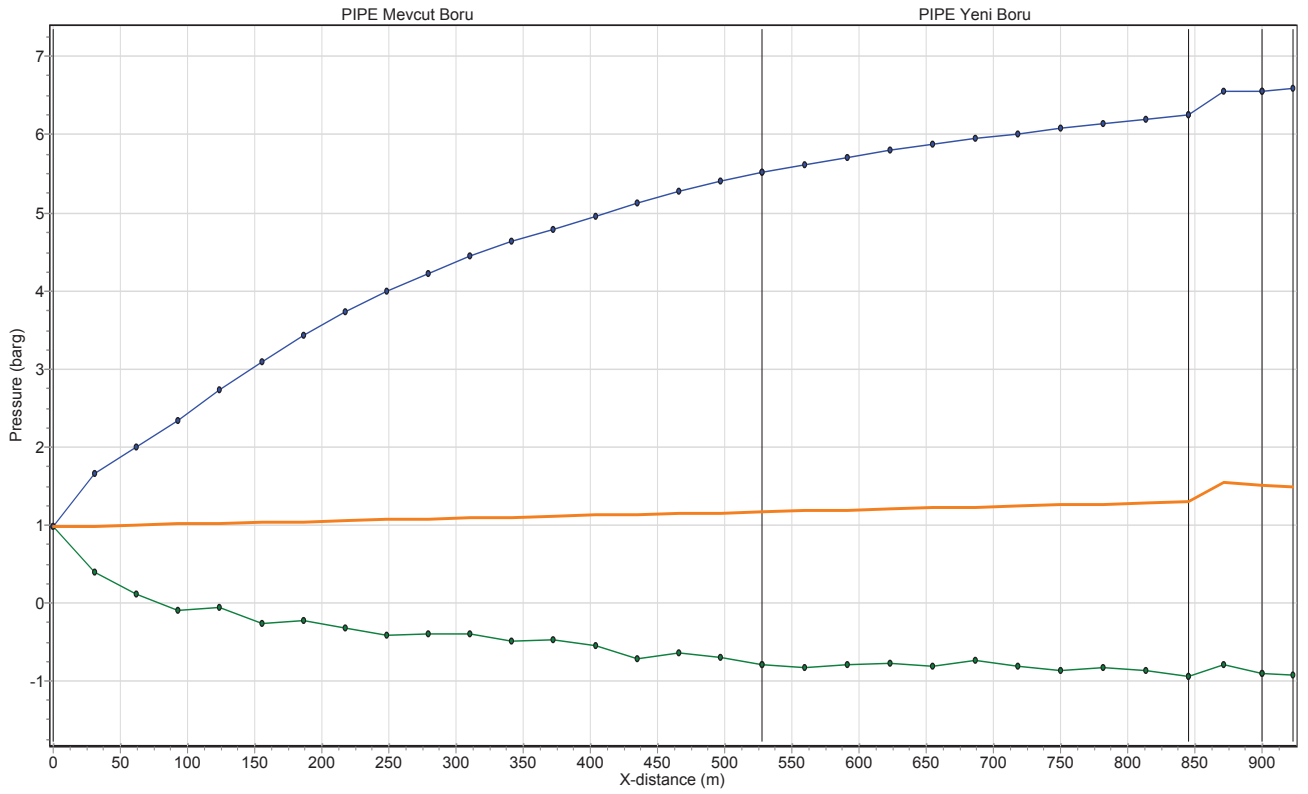
3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17
PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



— Labels —●— Profile (MARAS IS) —●— Head min (MARAS IS) —●— Head max (MARAS IS) — Head 0.00s (MARAS IS)

3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17



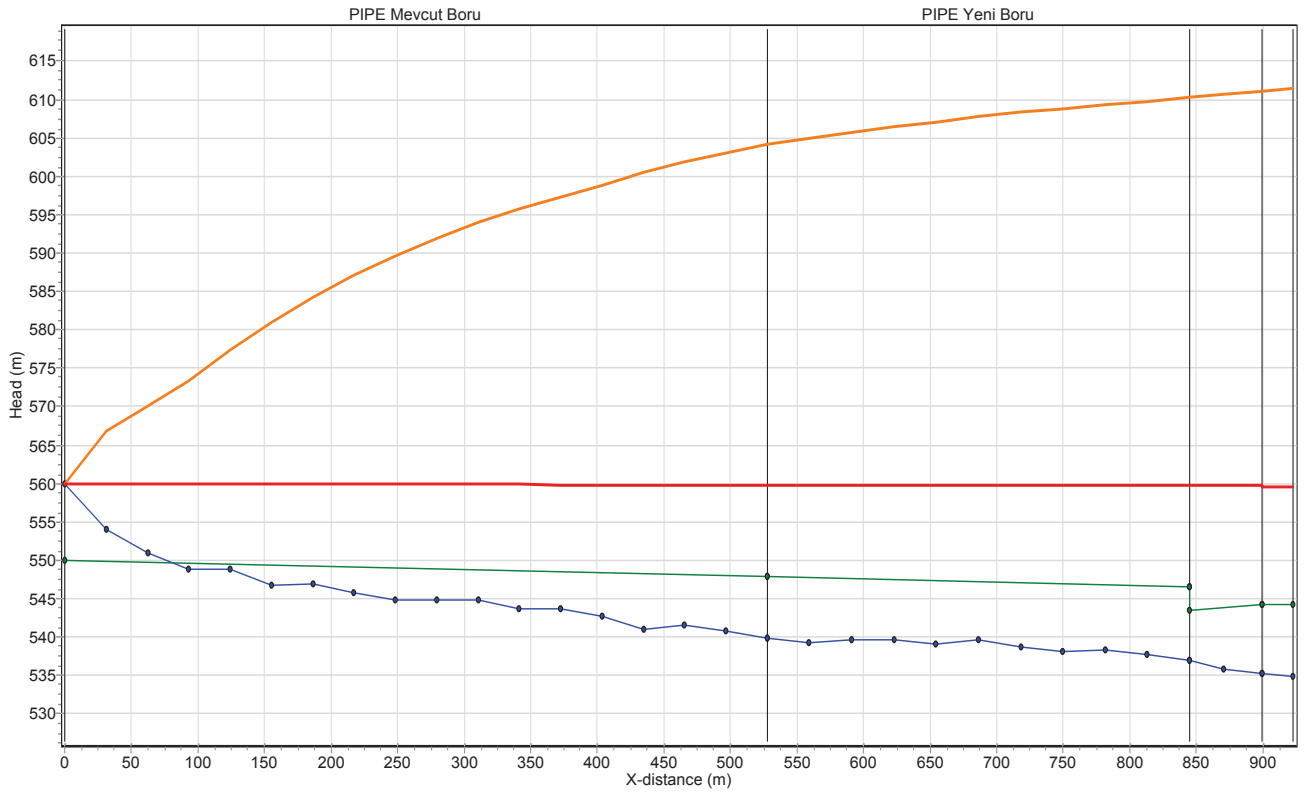
Labels

Pressure min (MARAS IS)

Pressure max (MARAS IS)

Pressure 0.00s (MARAS IS)

3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17



Labels

Profile (MARAS IS)

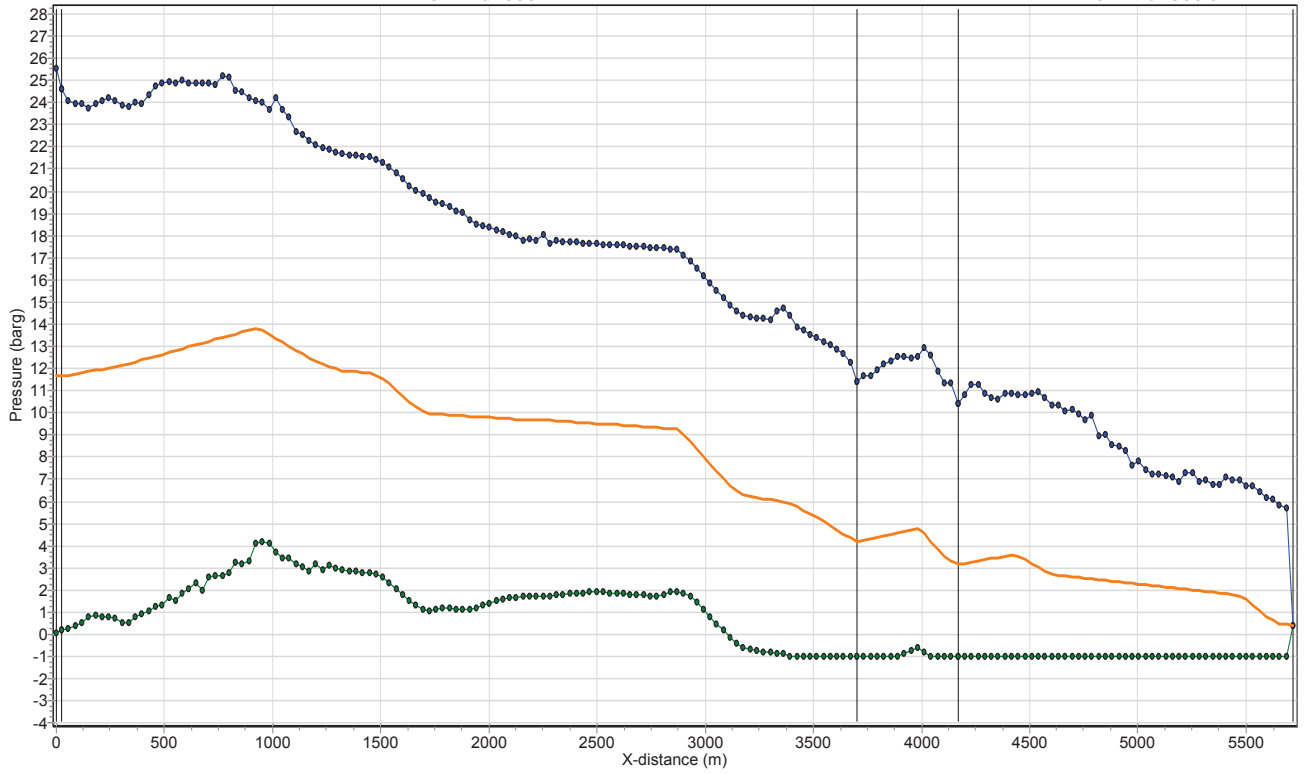
Head min (MARAS IS)

Head max (MARAS IS)

Head 0.00s (MARAS IS)

3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17
PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



Labels

Pressure min (MARAS IS)

Pressure max (MARAS IS)

Pressure 0.00s (MARAS IS)

1.KADEME Pİ

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 04:49:42

Case : 3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17

Title: 3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17

Case description:

=====

3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17

H-scheme connectivity:

=====

lhs H-node	H-component	rhs H-node
BF	BOUNDH ARITMA G.	
A	BOUNDH MENZELET BRJ	
L	CHECKV C1	M
R	CHECKV C2	S
W	CHECKV C3	X
AB	CHECKV C4	AC
G	PIPE 1100 B.	D
BR2	PIPE BASMA BORUSU-1	BD
BD	PIPE BASMA BORUSU-2	BE
BE	PIPE BASMA BORUSU-3	BF
AF	PIPE KOL15	BR2
A	PIPE Mevcut Boru	B
B	PIPE Yeni Boru	C
C	PIPE Yeni Boru.a	BR1
D	PRIGID KOL1	E
T	PRIGID KOL10	H
F	PRIGID KOL11	U
Y	PRIGID KOL12	I
AE	PRIGID KOL13	Z
AD	PRIGID KOL14	AF
E	PRIGID KOL2	F
F	PRIGID KOL3	AE
D	PRIGID KOL4	J
N	PRIGID KOL5	O
O	PRIGID KOL6	H
H	PRIGID KOL7	I
I	PRIGID KOL8	AF
E	PRIGID KOL9	P
K	PUMP P1	L
Q	PUMP P2	R

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

V	PUMP	P3	W
AA	PUMP	P4	AB
BR1	VALVE	EV1	G
J	VALVE	EV2	K
P	VALVE	EV3	Q
U	VALVE	EV4	V
Z	VALVE	EV5	AA
M	VALVE	SMS 600 BV	N
S	VALVE	SMS 601	T
X	VALVE	SMS 602	Y
AC	VALVE	SMS 603	AD

H-node heights:

=====

H-node	height [m]
A	550.000
AA	544.250
AB	544.250
AC	544.250
AD	544.250
AE	544.250
AF	544.250
B	547.800
BD	620.010
BE	630.180
BF	657.850
BR1	544.250
BR2	544.250
C	546.450
D	544.250
E	544.250
F	544.250
G	544.250
H	544.250
I	544.250
J	544.250
K	544.250
L	544.250
M	544.250
N	544.250
O	544.250
P	544.250
Q	544.250
R	544.250
S	544.250
T	544.250
U	544.250
V	544.250
W	544.250

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

X 544.250
Y 544.250
Z 544.250

Pipe profiles:

PIPE 1100 B. :

X-distance [m]	Height [m]
0.0000	544.25
23.150	544.25

PIPE BASMA BORUSU-1 :

X-distance [m]	Height [m]
0.0000	544.25
24.730	544.03
74.190	542.88
241.93	540.47
905.17	521.95
1162.8	536.76
1287.9	541.48
1434.8	542.87
1493.5	545.64
1611.2	556.25
1678.1	560.61
1708.1	561.37
2113.4	563.79
2262.5	564.32
2851.7	568.07
3095.7	594.62
3156.7	598.90
3349.6	601.52
3496.7	608.80
3676.3	620.01

PIPE BASMA BORUSU-2 :

X-distance [m]	Height [m]
0.0000	620.01
288.72	613.40
400.36	625.94
466.43	630.18

PIPE BASMA BORUSU-3 :

X-distance [m]	Height [m]
0.0000	630.18
256.23	625.62
312.25	627.71
424.29	634.60
1291.3	643.85

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

1319.4	644.85
1423.5	654.15
1495.1	657.30
1549.4	657.85

PRIGID	KOL1	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25

PRIGID	KOL10	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25

PRIGID	KOL11	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25

PRIGID	KOL12	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25

PRIGID	KOL13	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25

PRIGID	KOL14	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25

PIPE	KOL15	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			25.380	544.25

PRIGID	KOL2	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

PRIGID	KOL3	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL4	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PRIGID	KOL5	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25
PRIGID	KOL6	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL7	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL8	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL9	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PIPE	Mevcut Boru	:		
			X-distance	Height
			[m]	[m]
			0.0000	550.00
			527.65	547.80
PIPE	Yeni Boru	:		
			X-distance	Height
			[m]	[m]

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir
0.0000 547.80
317.35 546.45

PIPE Yeni Boru.a :

X-distance	Height
[m]	[m]
0.0000	546.45
0.0000	543.45
54.490	544.25

Fluid specifications:

=====

Fluid name	:	water	[-]
density	:	1000.	[kg/m3]
bulk modulus	:	0.2100E+10	[N/m2]
vapour pressure	:	0.1707E-01	[bar.a]
kinematic viscosity	:	0.1000E-05	[m2/s]

Physical constants:

=====

gravitational acceleration	:	9.810	[m/s2]
atmospheric pressure	:	1.014	[bar.a]

Time parameters

=====

time step	:	0.3000E-01	[s]
simulation end time	:	60.00	[s]

H-component input specifications:

=====

BOUNDH	ARITMA G.	-	Model name:	
	Comment	:		S: 659.00 m
	Keywords	:		
	Reference Id	:		
	Pressure head at t = 0 [s]	:	662.0	[m]

BOUNDH	MENZELET BRJ	-	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Pressure head at t = 0 [s]	:	560.0	[m]

CHECKV	C1	delta_p	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Inner diameter	:	600.0	[mm]
	Loss coefficient	:	1.600	[-]
	Delta_p for reopen	:	0.5000E-01	[bar]
	Initial state	:	Open	

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

CHECKV	C2	delta_p	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Inner diameter	:	600.0 [mm]
	Loss coefficient	:	1.600 [-]
	Delta_p for reopen	:	0.5000E-01 [bar]
	Initial state	:	Open
CHECKV	C3	delta_p	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Inner diameter	:	600.0 [mm]
	Loss coefficient	:	1.600 [-]
	Delta_p for reopen	:	0.5000E-01 [bar]
	Initial state	:	Open
CHECKV	C4	delta_p	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Inner diameter	:	600.0 [mm]
	Loss coefficient	:	1.600 [-]
	Delta_p for reopen	:	0.5000E-01 [bar]
	Initial state	:	Closed
PIPE	1100 B.	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Waterhammer
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number
Diameter			
[mm]			
	Elbow 90 degr; R=1.5D		0.200
	Elbow 45 degr; R=1.5D		0.120
	Elbow 22,5 degr; R=1.5D		0.800E-01
	Elbow 11,25 degr; R=1.5D		0.500E-01
	Tee; flow through run		0.300 2
	Tee; flow through branch		0.900
PIPE	BASMA BORUSU-1	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01 66
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300
 Tee; flow through branch 0.900

PIPE BASMA BORUSU-2 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01 11
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300
 Tee; flow through branch 0.900

PIPE BASMA BORUSU-3 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	17
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	

PIPE	KOL15	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Waterhammer
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number
Diameter			
			[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PIPE	Mevcut Boru	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Waterhammer
	Inner diameter	:	1495. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	14.30 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number
Diameter			
			[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	1
Elbow 45 degr; R=1.5D	0.120	1
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PIPE	Yeni Boru	Pipe_Xi	Model name:
	Comment	:	

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1692. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 17.50 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	1
Elbow 45 degr; R=1.5D	0.120	1
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PIPE Yeni Boru.a Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1692. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 17.50 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	1
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL1 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir
[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL10	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:	St	
	Calculation mode:	Rigid column		
	Inner diameter	:	600.0	[mm]
	Wall roughness	:	0.1500	[mm]
	Wall thickness	:	11.00	[mm]
	Young's modulus	:	0.2100E+12	[N/m2]
	local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL11	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:	St	
	Calculation mode:	Rigid column		
	Inner diameter	:	700.0	[mm]
	Wall roughness	:	0.1500	[mm]
	Wall thickness	:	11.00	[mm]
	Young's modulus	:	0.2100E+12	[N/m2]
	local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL12	Pipe_Xi	Model name:	

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL13 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL14 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID

KOL2

Pipe_Xi

Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 1100. [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID

KOL3

Pipe_Xi

Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 1100. [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

PRIGID KOL4 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL5 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL6 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL7 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL8 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

```

PRIGID  KOL9          Pipe_Xi      Model name:
Comment      :
Keywords     :
Reference Id  :
Material name : St
Calculation mode: Rigid column
Inner diameter      :      700.0      [mm]
Wall roughness      :      0.1500     [mm]
Wall thickness      :      11.00      [mm]
Young's modulus     :      0.2100E+12 [N/m2]
local losses              Loss coef Xi      Number
Diameter
[mm]
Elbow 90 degr; R=1.5D      0.200
Elbow 45 degr; R=1.5D      0.120      2
Elbow 22,5 degr; R=1.5D    0.800E-01
Elbow 11,25 degr; R=1.5D   0.500E-01
Tee; flow through run      0.300      1
Tee; flow through branch   0.900      1

PUMP      P1          Model name:
Comment      :
Keywords     :
Reference Id  : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table     : Table
Discharge     Pump head
[1/s]         [m]
0.0000        170.00
250.00        159.60
350.00        150.00
390.00        146.00
500.00        134.00
565.00        125.00
600.00        120.00
655.00        110.00

QHE_table     : Table
Discharge     Efficiency
[1/s]         [%]
0.0000        0.0000
250.00        74.000
350.00        82.000
390.00        84.000
500.00        84.500
565.00        84.000
600.00        82.000
655.00        78.000

Suter         : Table
Suter         : Table
Rated speed    :      1450.      [rpm]

```


3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Discharge
 Initial speed : [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P2

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir
655.00 78.000

Suter : Table
Suter : Table
Rated speed : 1450. [rpm]
Q in best point of eff. : [l/s]
H in best point of eff. : [m]
T in best point of eff. : [kNm]
Initial setting : Discharge
Initial speed : [rpm]
Initial suction head : [m]
Initial pressure head : [m]
Initial discharge : 500.0 [l/s]
Initial relative frequency : [%]
Speed-Torque char. of motor : Table
Polar moment of inertia : 30.00 [kgm2]
Drive type : Trip
Trip time : 0.000 [s]
Action table speed : Table
Action table motorfreq. : Table
Minimum speed for tripping : 20.00 [rpm]
Minimum rel.freq. for tripping: [%]
Required speed : [rpm]
Minimum speed : [rpm]
Maximum speed : [rpm]
Maximum power : [kW]
Level ON : [m]
Level OFF : [m]
Start time (0 to max) : [s]
Stop time (max to 0) : [s]

PUMP

P3 Model name:

Comment :
Keywords :
Reference Id : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Discharge
 Initial speed : [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P4

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table
 Discharge Efficiency

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter	:	Table	
Suter	:	Table	
Rated speed	:	1450.	[rpm]
Q in best point of eff.	:		[l/s]
H in best point of eff.	:		[m]
T in best point of eff.	:		[kNm]
Initial setting	:	Speed	
Initial speed	:	0.000	[rpm]
Initial suction head	:		[m]
Initial pressure head	:		[m]
Initial discharge	:	500.0	[l/s]
Initial relative frequency	:		[%]
Speed-Torque char. of motor	:	Table	
Polar moment of inertia	:	30.00	[kgm2]
Drive type	:	Trip	
Trip time	:	0.000	[s]
Action table speed	:	Table	
Action table motorfreq.	:	Table	
Minimum speed for tripping	:	20.00	[rpm]
Minimum rel.freq. for tripping:	:		[%]
Required speed	:		[rpm]
Minimum speed	:		[rpm]
Maximum speed	:		[rpm]
Maximum power	:		[kW]
Level ON	:		[m]
Level OFF	:		[m]
Start time (0 to max)	:		[s]
Stop time (max to 0)	:		[s]

VALVE	EV1	Universal	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Characteristic type	:	Kv	
	Standard type	:	Buttrfly	
	Kv Characteristic	:	Table	
			Position open	Kv
			[%]	[m3/h/(bar) ^½]
			0.0000	0.0000
			9.1600	2089.7
			29.600	3678.4
			49.300	14351.
			66.600	32029.

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

69.400	36300.
84.500	60500.
100.00	96800.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 1100. [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE EV2 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV3 Universal Model name:
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV4 Universal Model name:
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV5 Universal Model name:

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

	97.000	0.40853
	100.00	0.40000
Inner diameter	: 700.0	[mm]
Initial setting	: Position	
Initial position (open)	: 100.0	[%]
Initial upstream head	:	[m]
Initial downstream head	:	[m]
Initial discharge	:	[l/s]
Initial upstream pressure	:	[barg]
Initial downstream pressure	:	[barg]
Check cavitation	: No	
Cavitation table	: Table	

VALVE SMS 600 BV Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter	: 600.0	[mm]
Initial setting	: Position	
Initial position (open)	: 100.0	[%]

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 601 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Butterfly
Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Check cavitation : No
Cavitation table : Table

VALVE SMS 602 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Butterfly
Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 603 Universal Model name: SMS 600

Comment :

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

Calculated pipe data:
=====

PIPE	length	C_calc	C_adapt	N_elem
	[m]	[m/s]	[m/s]	[-]
PIPE 1100 B.	23.150	1025.	772.	1

3.1.1 INPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wir

PIPE	BASMA BORUSU-1	3679.934	1033.	1031.	119
PIPE	BASMA BORUSU-2	467.344	1033.	1039.	15
PIPE	BASMA BORUSU-3	1550.225	1033.	1033.	50
PRIGID	KOL1	4.250	used as rigid column		
PRIGID	KOL10	15.200	used as rigid column		
PRIGID	KOL11	7.100	used as rigid column		
PRIGID	KOL12	15.200	used as rigid column		
PRIGID	KOL13	7.100	used as rigid column		
PRIGID	KOL14	15.200	used as rigid column		
PIPE	KOL15	25.380	1025.	846.	1
PRIGID	KOL2	4.250	used as rigid column		
PRIGID	KOL3	4.250	used as rigid column		
PRIGID	KOL4	7.100	used as rigid column		
PRIGID	KOL5	15.200	used as rigid column		
PRIGID	KOL6	4.250	used as rigid column		
PRIGID	KOL7	4.250	used as rigid column		
PRIGID	KOL8	4.250	used as rigid column		
PRIGID	KOL9	7.100	used as rigid column		
PIPE	Mevcut Boru	527.655	1013.	1035.	17
PIPE	Yeni Boru	317.353	1033.	1058.	10
PIPE	Yeni Boru.a	57.496	1033.	958.	2

Active H-components:

=====

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 04:49:42

Case : 3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17

Title: 3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17

Case description:

=====

3.1.1 K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17

Steady state results:

Pipes:

Name v	length [m]	lambda [-]	wall rough. [mm]	c_calc [m/s]	c_adapt [m/s]	N_elem [-]	Q [l/s]
1100 B. 1.578	23.15	0.0420	0.150	1024.70	771.67	1	1500.000
BASMA BORUSU-1 0.667	3679.93	0.0156	0.150	1033.29	1030.79	119	1500.000
BASMA BORUSU-2 0.667	467.34	0.0163	0.150	1033.29	1038.54	15	1500.000
BASMA BORUSU-3 0.667	1550.22	0.0146	0.150	1033.29	1033.48	50	1500.000
KOL15 1.578	25.38	0.0265	0.150	1024.70	846.00	1	1500.000
Mevcut Boru 0.855	527.65	0.0175	0.150	1013.25	1034.62	17	1500.000
Yeni Boru 0.667	317.35	0.0164	0.150	1033.29	1057.84	10	1500.000
Yeni Boru.a 0.667	57.50	0.0255	0.150	1033.29	958.26	2	1500.000

Discharges and velocities through H-components:

H-component	discharge [l/s]	velocity [m/s]
BOUNDH ARITMA G.	-1500.000	
BOUNDH MENZELET BRJ	1500.000	
CHECKV C1	500.000	1.768
CHECKV C2	500.000	1.768

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

CHECKV	C3	500.000	1.768
CHECKV	C4	0.000	
PRIGID	KOL1	1000.000	1.052
PRIGID	KOL10	500.000	1.768
PRIGID	KOL11	500.000	1.299
PRIGID	KOL12	500.000	1.768
PRIGID	KOL13	0.000	
PRIGID	KOL14	0.000	
PRIGID	KOL2	500.000	0.526
PRIGID	KOL3	0.000	
PRIGID	KOL4	500.000	1.299
PRIGID	KOL5	500.000	1.768
PRIGID	KOL6	500.000	0.526
PRIGID	KOL7	1000.000	1.052
PRIGID	KOL8	1500.000	1.578
PRIGID	KOL9	500.000	1.299
PUMP	P1	500.000	
PUMP	P2	500.000	
PUMP	P3	500.000	
PUMP	P4	0.000	
VALVE	EV1	1500.000	1.578
VALVE	EV2	500.000	1.299
VALVE	EV3	500.000	1.299
VALVE	EV4	500.000	1.299
VALVE	EV5	0.000	
VALVE	SMS 600 BV	500.000	1.768
VALVE	SMS 601	500.000	1.768
VALVE	SMS 602	500.000	1.768
VALVE	SMS 603	0.000	

Pressures and heads in H-nodes:

H-node	pressure [barg]	head [m]
A	0.98	560.000
AA	1.49	559.512
AB	1.49	559.512
AC	11.67	663.251
AD	11.67	663.251
AE	1.49	559.512
AF	11.67	663.251
B	1.17	559.770
BD	4.15	662.406
BE	3.15	662.304
BF	0.40	662.000
BR1	1.51	559.681
BR2	11.66	663.174
C	1.30	559.700
D	1.50	559.537
E	1.49	559.517
F	1.49	559.512

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

G	1.51	559.649
H	11.68	663.316
I	11.67	663.296
J	1.48	559.400
K	1.48	559.369
L	11.74	663.935
M	11.71	663.680
N	11.70	663.612
O	11.68	663.321
P	1.48	559.380
Q	1.48	559.349
R	11.74	663.930
S	11.71	663.675
T	11.70	663.607
U	1.48	559.375
V	1.48	559.344
W	11.73	663.910
X	11.71	663.655
Y	11.70	663.587
Z	1.49	559.512

Additional H-component output:

PUMP	P1	Pump speed	1315.977	[rpm]
		Fluid torque	4.419	[kNm]
		Motor torque	4.419	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.223	[%]
		Power	608.976	[kW]
		Energy	0.000	[kJ]
PUMP	P2	Pump speed	1316.049	[rpm]
		Fluid torque	4.419	[kNm]
		Motor torque	4.419	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.223	[%]
		Power	609.060	[kW]
		Energy	0.000	[kJ]
PUMP	P3	Pump speed	1315.977	[rpm]
		Fluid torque	4.419	[kNm]
		Motor torque	4.419	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.223	[%]
		Power	608.976	[kW]
		Energy	0.000	[kJ]
PUMP	P4	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	84.223	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
VALVE	EV1	Valve position (open)	100.000	[%]

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

		Pressure ratio Xf	0.001	[-]
VALVE	EV2	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV3	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV4	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	SMS 600 BV	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 601	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 602	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 603	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]

Extreme values in pipes:

Head:

Pipe location	minimum	time	location	maximum	time	
	[m]	[s]	[m]	[m]	[s]	[m]
1100 B. 23.15	534.861	7.800	23.15	611.450	1.800	
BASMA BORUSU-1 0.00	544.279	50.430	309.24	795.116	40.080	
BASMA BORUSU-2 342.72	605.669	53.700	186.94	748.078	43.950	
BASMA BORUSU-3 62.01	615.604	54.210	248.04	743.810	43.770	
KOL15 0.00	544.976	49.650	0.00	804.617	16.800	
Mevcut Boru 527.65	539.863	3.870	527.65	604.116	1.410	
Yeni Boru 317.35	536.921	7.770	317.35	610.260	1.710	
Yeni Boru.a 57.50	535.177	7.830	57.50	611.022	1.770	

Pressure:

Pipe location	minimum	time	location	maximum	time
	[barg]	[s]	[m]	[barg]	[s]
[m]					
1100 B. 23.15	-0.921	7.800	23.15	6.592	1.800

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

BASMA BORUSU-1	-0.997	5.640	3679.93	25.210	39.300
742.17					
BASMA BORUSU-2	-0.997	5.640	0.00	12.939	43.950
311.56					
BASMA BORUSU-3	-0.997	5.910	0.00	11.285	43.740
93.01					
KOL15	0.071	49.650	0.00	25.542	16.800
0.00					
Mevcut Boru	-0.779	3.870	527.65	5.525	1.410
527.65					
Yeni Boru	-0.935	7.770	317.35	6.260	1.710
317.35					
Yeni Boru.a	-0.935	7.770	0.00	6.556	1.740
28.75					

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
BASMA BORUSU-1	0.1058E-01	7.410	3679.93
BASMA BORUSU-2	0.1050E-01	7.410	0.00
BASMA BORUSU-3	0.9441E-02	7.500	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00
Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

Extreme discharges through H-components:

H-component	minimum [l/s]	time [s]	maximum [l/s]	time [s]
BOUNDH ARITMA G.	-2880.102	45.600	3050.130	57.120
BOUNDH MENZELET BRJ	-464.682	10.500	1500.000	0.060
CHECKV C1	0.000	2.520	500.000	0.000
CHECKV C2	0.000	2.490	500.000	0.000
CHECKV C3	0.000	2.460	500.000	0.000
CHECKV C4	0.000	0.150	30.638	50.760
PRIGID KOL1	0.000	7.200	1000.000	0.000
PRIGID KOL10	0.000	2.490	500.000	0.000
PRIGID KOL11	0.000	2.460	500.000	0.000
PRIGID KOL12	0.000	2.460	500.000	0.000
PRIGID KOL13	0.000	0.120	30.638	50.760
PRIGID KOL14	0.000	0.000	30.638	50.760
PRIGID KOL2	0.000	50.880	500.000	0.000
PRIGID KOL3	0.000	0.150	30.638	50.760
PRIGID KOL4	0.000	35.250	500.000	0.000
PRIGID KOL5	0.000	2.490	500.000	0.000
PRIGID KOL6	0.000	2.490	500.000	0.000
PRIGID KOL7	0.000	2.610	1000.000	0.000

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

PRIGID	KOL8	0.000	14.010	1500.000	0.000
PRIGID	KOL9	0.000	51.270	500.000	0.000
PUMP	P1	0.000	2.520	500.000	0.000
PUMP	P2	0.000	2.490	500.000	0.000
PUMP	P3	0.000	2.460	500.000	0.000
PUMP	P4	0.000	0.000	30.638	50.760
VALVE	EV1	-94.027	53.040	1500.000	0.030
VALVE	EV2	0.000	2.520	500.000	0.000
VALVE	EV3	0.000	2.490	500.000	0.000
VALVE	EV4	0.000	2.460	500.000	0.000
VALVE	EV5	0.000	0.150	30.638	50.760
VALVE	SMS 600 BV	0.000	2.490	500.000	0.000
VALVE	SMS 601	0.000	2.490	500.000	0.000
VALVE	SMS 602	0.000	2.460	500.000	0.000
VALVE	SMS 603	0.000	0.150	30.638	50.760

Extreme pressure heads in H-nodes:

H-node	minimum [m]	time [s]	maximum [m]	time [s]
A	560.000	0.000	560.000	0.000
AA	534.861	7.800	611.485	1.800
AB	534.861	7.800	611.485	1.800
AC	546.000	49.650	804.617	16.800
AD	546.000	49.650	804.617	16.800
AE	534.861	7.800	611.485	1.800
AF	544.976	49.650	804.617	16.800
B	539.863	3.870	604.116	1.410
BD	609.848	5.640	736.325	43.020
BE	620.018	5.910	736.432	44.100
BF	662.000	0.000	662.000	0.000
BR1	535.177	7.830	611.022	1.770
BR2	546.580	50.730	795.116	40.080
C	536.921	7.770	610.260	1.710
D	534.861	7.800	611.450	1.800
E	534.861	7.800	611.473	1.800
F	534.861	7.800	611.485	1.800
G	535.177	7.830	611.017	1.770
H	545.399	49.650	804.617	16.800
I	545.228	49.650	804.617	16.800
J	534.861	7.800	611.482	1.800
K	534.861	7.800	611.476	1.800
L	535.755	58.110	663.935	0.000
M	546.146	50.130	804.617	16.800
N	546.146	50.130	804.617	16.800
O	545.489	49.650	804.617	16.800
P	534.861	7.800	611.504	1.800
Q	534.861	7.800	611.499	1.800
R	535.755	58.110	663.930	0.000
S	546.146	50.130	804.617	16.800
T	546.146	50.130	804.617	16.800

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

U	534.861	7.800	611.517	1.800
V	534.861	7.800	611.512	1.800
W	535.755	58.110	663.910	0.000
X	546.146	50.130	804.617	16.800
Y	546.146	50.130	804.617	16.800
Z	534.861	7.800	611.485	1.800

Extreme pressures in H-nodes:

H-node	minimum [barg]	time [s]	maximum [barg]	time [s]
A	0.981	0.000	0.981	0.000
AA	-0.921	7.800	6.596	1.800
AB	-0.921	7.800	6.596	1.800
AC	0.172	49.650	25.542	16.800
AD	0.172	49.650	25.542	16.800
AE	-0.921	7.800	6.596	1.800
AF	0.071	49.650	25.542	16.800
B	-0.779	3.870	5.525	1.410
BD	-0.997	5.640	11.411	43.020
BE	-0.997	5.910	10.423	44.100
BF	0.407	0.000	0.407	0.000
BR1	-0.890	7.830	6.550	1.770
BR2	0.229	50.730	24.610	40.080
C	-0.935	7.770	6.260	1.710
D	-0.921	7.800	6.592	1.800
E	-0.921	7.800	6.595	1.800
F	-0.921	7.800	6.596	1.800
G	-0.890	7.830	6.550	1.770
H	0.113	49.650	25.542	16.800
I	0.096	49.650	25.542	16.800
J	-0.921	7.800	6.595	1.800
K	-0.921	7.800	6.595	1.800
L	-0.833	58.110	11.741	0.000
M	0.186	50.130	25.542	16.800
N	0.186	50.130	25.542	16.800
O	0.122	49.650	25.542	16.800
P	-0.921	7.800	6.598	1.800
Q	-0.921	7.800	6.597	1.800
R	-0.833	58.110	11.741	0.000
S	0.186	50.130	25.542	16.800
T	0.186	50.130	25.542	16.800
U	-0.921	7.800	6.599	1.800
V	-0.921	7.800	6.598	1.800
W	-0.833	58.110	11.739	0.000
X	0.186	50.130	25.542	16.800
Y	0.186	50.130	25.542	16.800
Z	-0.921	7.800	6.596	1.800

Extreme values of additional H-component output:

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

H-component	minimum	time [s]	maximum	time [s]
PUMP P1				
Pump speed [rpm]	28.317	60.000	1315.977	0.000
Fluid torque [kNm]	0.001	60.000	4.419	0.000
Motor torque [kNm]	0.000	0.030	4.419	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.030	608.976	0.000
Energy [kJ]	0.000	0.000	18.269	0.030
PUMP P2				
Pump speed [rpm]	28.336	60.000	1316.049	0.000
Fluid torque [kNm]	0.001	60.000	4.419	0.000
Motor torque [kNm]	0.000	0.030	4.419	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.030	609.060	0.000
Energy [kJ]	0.000	0.000	18.272	0.030
PUMP P3				
Pump speed [rpm]	28.336	60.000	1315.977	0.000
Fluid torque [kNm]	0.001	60.000	4.419	0.000
Motor torque [kNm]	0.000	0.030	4.419	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.030	608.976	0.000
Energy [kJ]	0.000	0.000	18.269	0.030
PUMP P4				
Pump speed [rpm]	0.000	0.000	0.541	51.480
Fluid torque [kNm]	-0.008	50.790	0.000	0.000
Motor torque [kNm]	0.000	0.000	0.000	0.000
ON/OFF [-]	0.000	0.000	0.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.000	0.000	0.000
Energy [kJ]	0.000	0.000	0.000	0.000
VALVE EV1				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	2.370	0.001	0.000
VALVE EV2				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	2.400	0.001	0.000
VALVE EV3				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	2.430	0.001	0.000
VALVE EV4				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	2.370	0.001	0.000
VALVE EV5				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	50.760
VALVE SMS 600 BV				
Valve position (open) [%]	100.000	0.000	100.000	0.000

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

Pressure ratio Xf [-]	0.000	2.430	0.001	0.030
VALVE SMS 601				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	2.460	0.001	0.030
VALVE SMS 602				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	2.430	0.001	0.000
VALVE SMS 603				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	50.760

Component messages:

At 0.0000	s VALVE	EV1	Starts in open phase
At 0.0000	s VALVE	EV2	Starts in open phase
At 0.0000	s PUMP	P1	Pump specific speed = 26.0
At 0.0000	s VALVE	SMS 600 BV	Starts in open phase
At 0.0000	s VALVE	EV3	Starts in open phase
At 0.0000	s PUMP	P2	Pump specific speed = 26.0
At 0.0000	s VALVE	SMS 601	Starts in open phase
At 0.0000	s VALVE	EV4	Starts in open phase
At 0.0000	s PUMP	P3	Pump specific speed = 26.0
At 0.0000	s VALVE	SMS 602	Starts in open phase
At 0.0000	s VALVE	EV5	Starts in open phase
At 0.0000	s PUMP	P4	Pump specific speed = 26.0
At 0.0000	s VALVE	SMS 603	Starts in open phase
At 0.0000	s PUMP	P1	Initial pump speed = 1315.977 [rpm]
At 0.0000	s PUMP	P2	Initial pump speed = 1316.049 [rpm]
At 0.0000	s PUMP	P3	Initial pump speed = 1315.977 [rpm]
At 0.0000	s CHECKV	C1	Starts in open phase
At 0.0000	s CHECKV	C2	Starts in open phase
At 0.0000	s CHECKV	C3	Starts in open phase
At 0.0000	s CHECKV	C4	Starts in closed phase
At 0.30000E-01	s PUMP	P1	tripping
At 0.30000E-01	s PUMP	P2	tripping
At 0.30000E-01	s PUMP	P3	tripping
At 0.30000E-01	s PUMP	P4	tripping
At 2.4600	s CHECKV	C1	Closes
At 2.4600	s CHECKV	C3	Closes
At 2.4900	s CHECKV	C2	Closes
At 5.6400	s H-node	BD	Cavitates
At 5.9100	s H-node	BE	Cavitates
At 9.3000	s H-node	BD	Cavitation collapses
At 9.9900	s H-node	BE	Cavitation collapses
At 27.750	s CHECKV	C1	Opens
At 27.750	s CHECKV	C2	Opens
At 27.750	s CHECKV	C3	Opens
At 27.750	s CHECKV	C4	Opens
At 27.810	s CHECKV	C1	Closes
At 27.810	s CHECKV	C2	Closes
At 27.810	s CHECKV	C3	Closes
At 27.810	s CHECKV	C4	Closes

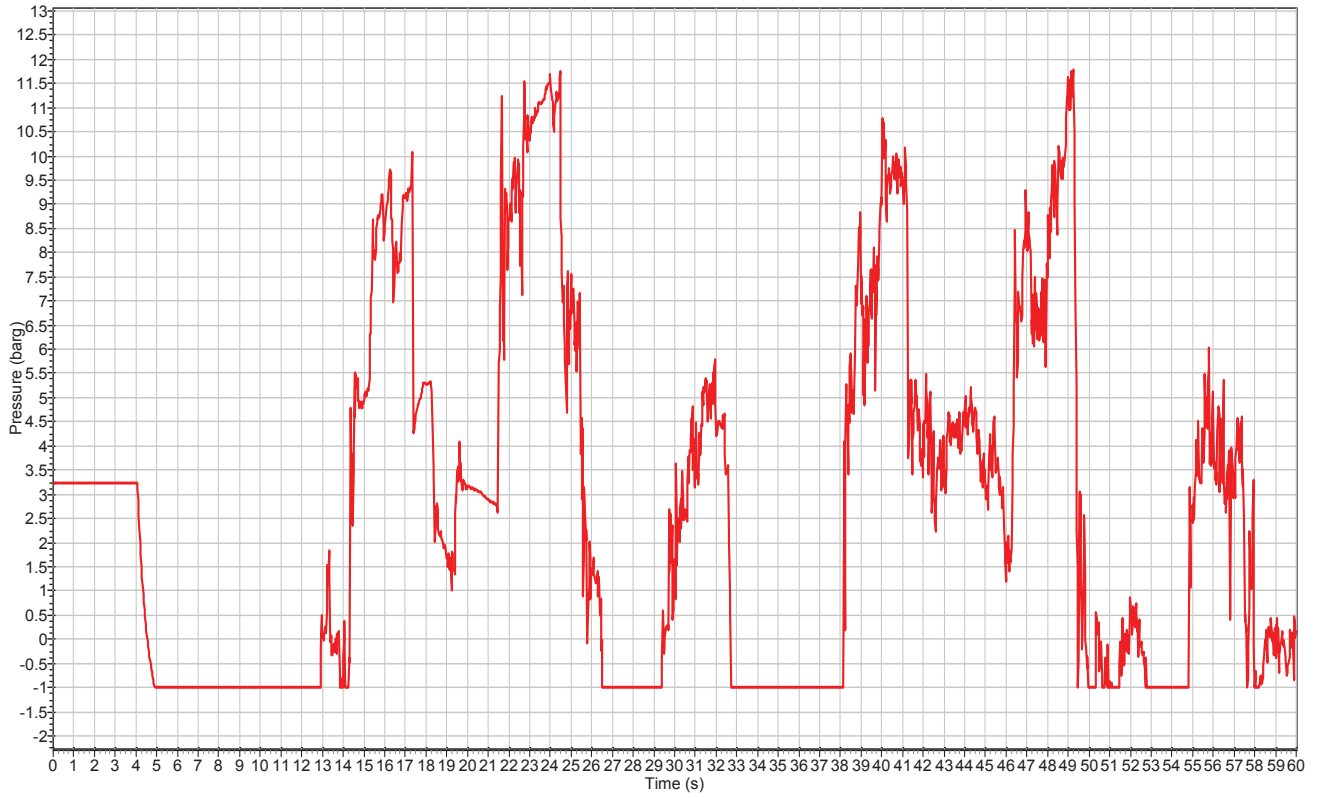
3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

At	27.840	s	CHECKV	C1	Opens
At	27.840	s	CHECKV	C2	Opens
At	27.840	s	CHECKV	C3	Opens
At	27.840	s	CHECKV	C4	Opens
At	27.870	s	CHECKV	C1	Closes
At	27.870	s	CHECKV	C2	Closes
At	27.870	s	CHECKV	C3	Closes
At	27.870	s	CHECKV	C4	Closes
At	27.930	s	CHECKV	C1	Opens
At	27.930	s	CHECKV	C2	Opens
At	27.930	s	CHECKV	C3	Opens
At	27.930	s	CHECKV	C4	Opens
At	28.230	s	CHECKV	C1	Closes
At	28.230	s	CHECKV	C2	Closes
At	28.230	s	CHECKV	C3	Closes
At	28.230	s	CHECKV	C4	Closes
At	29.400	s	H-node	BD	Cavitates
At	29.790	s	H-node	BE	Cavitates
At	31.980	s	H-node	BD	Cavitation collapses
At	33.060	s	H-node	BE	Cavitation collapses
At	49.650	s	CHECKV	C1	Opens
At	49.650	s	CHECKV	C2	Opens
At	49.650	s	CHECKV	C3	Opens
At	49.650	s	CHECKV	C4	Opens
At	49.680	s	CHECKV	C4	Closes
At	49.710	s	CHECKV	C1	Closes
At	49.710	s	CHECKV	C2	Closes
At	49.710	s	CHECKV	C3	Closes
At	50.640	s	CHECKV	C1	Opens
At	50.640	s	CHECKV	C2	Opens
At	50.640	s	CHECKV	C3	Opens
At	50.640	s	CHECKV	C4	Opens
At	50.880	s	CHECKV	C1	Closes
At	50.880	s	CHECKV	C2	Closes
At	50.880	s	CHECKV	C3	Closes
At	50.880	s	CHECKV	C4	Closes
At	50.970	s	CHECKV	C1	Opens
At	50.970	s	CHECKV	C2	Opens
At	50.970	s	CHECKV	C3	Opens
At	50.970	s	CHECKV	C4	Opens
At	51.000	s	CHECKV	C1	Closes
At	51.000	s	CHECKV	C2	Closes
At	51.000	s	CHECKV	C3	Closes
At	51.000	s	CHECKV	C4	Closes
At	51.060	s	CHECKV	C1	Opens
At	51.060	s	CHECKV	C2	Opens
At	51.060	s	CHECKV	C3	Opens
At	51.060	s	CHECKV	C4	Opens
At	51.270	s	CHECKV	C1	Closes
At	51.270	s	CHECKV	C4	Closes
At	51.270	s	CHECKV	C2	Closes
At	51.270	s	CHECKV	C3	Closes

3.1.1 OUTPUT - K.MARAS 1.KD -ÖNLEMSİZ -03 JUL 17.wor

At	51.330	s	CHECKV	C1	Opens
At	51.330	s	CHECKV	C2	Opens
At	51.330	s	CHECKV	C3	Opens
At	51.330	s	CHECKV	C4	Opens
At	51.480	s	CHECKV	C1	Closes
At	51.480	s	CHECKV	C2	Closes
At	51.480	s	CHECKV	C3	Closes
At	51.480	s	CHECKV	C4	Closes
At	53.250	s	H-node	BD	Cavitates
At	53.460	s	H-node	BE	Cavitates
At	54.420	s	H-node	BD	Cavitation collapses
At	54.510	s	H-node	BE	Cavitation collapses
At	54.600	s	H-node	BE	Cavitates
At	55.440	s	H-node	BE	Cavitation collapses

3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

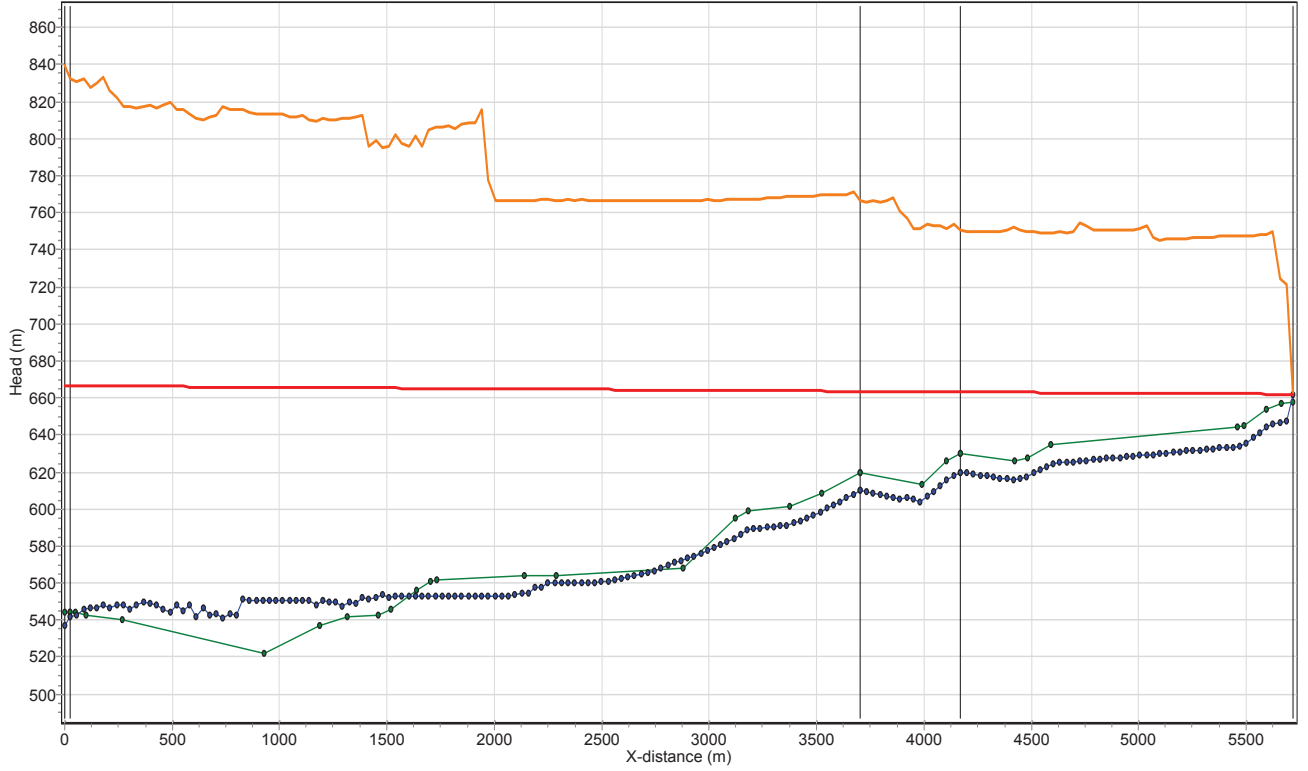


— Pressure H-node BE (MARAS IS)

AL DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALİ FENERCİOĞLU\MARAS İCMESUY-KURSAT KARAPINAR\3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdi

3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17
PIPE BASMA BORUSU-1

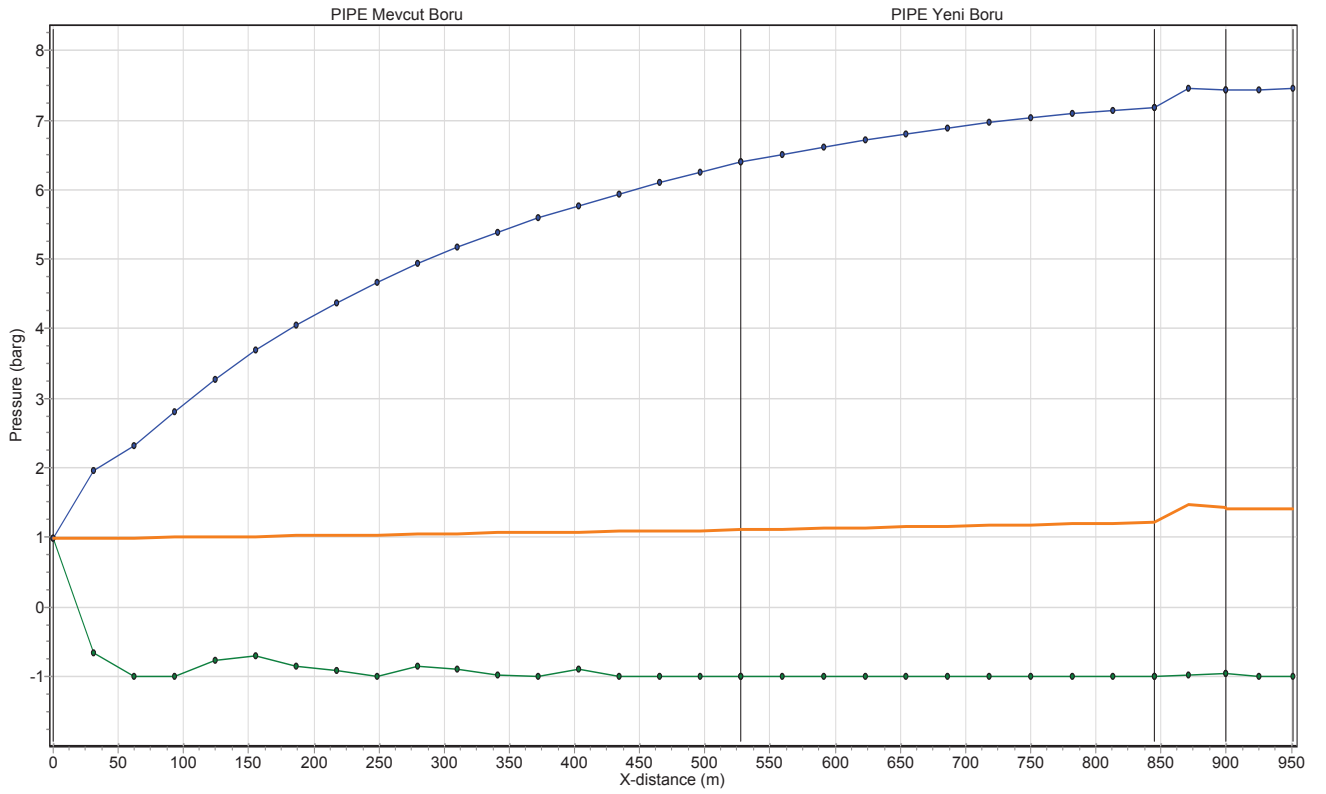
PIPE BASMA BORUSU-3



Labels Profile (MARAS IS) Head min (MARAS IS) Head max (MARAS IS) Head 0.00s (MARAS IS)

AL DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALI FENERCİOĞLU\MARAS ICMESUY-KURSAT KARAPINAR\3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdi

3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17



Labels

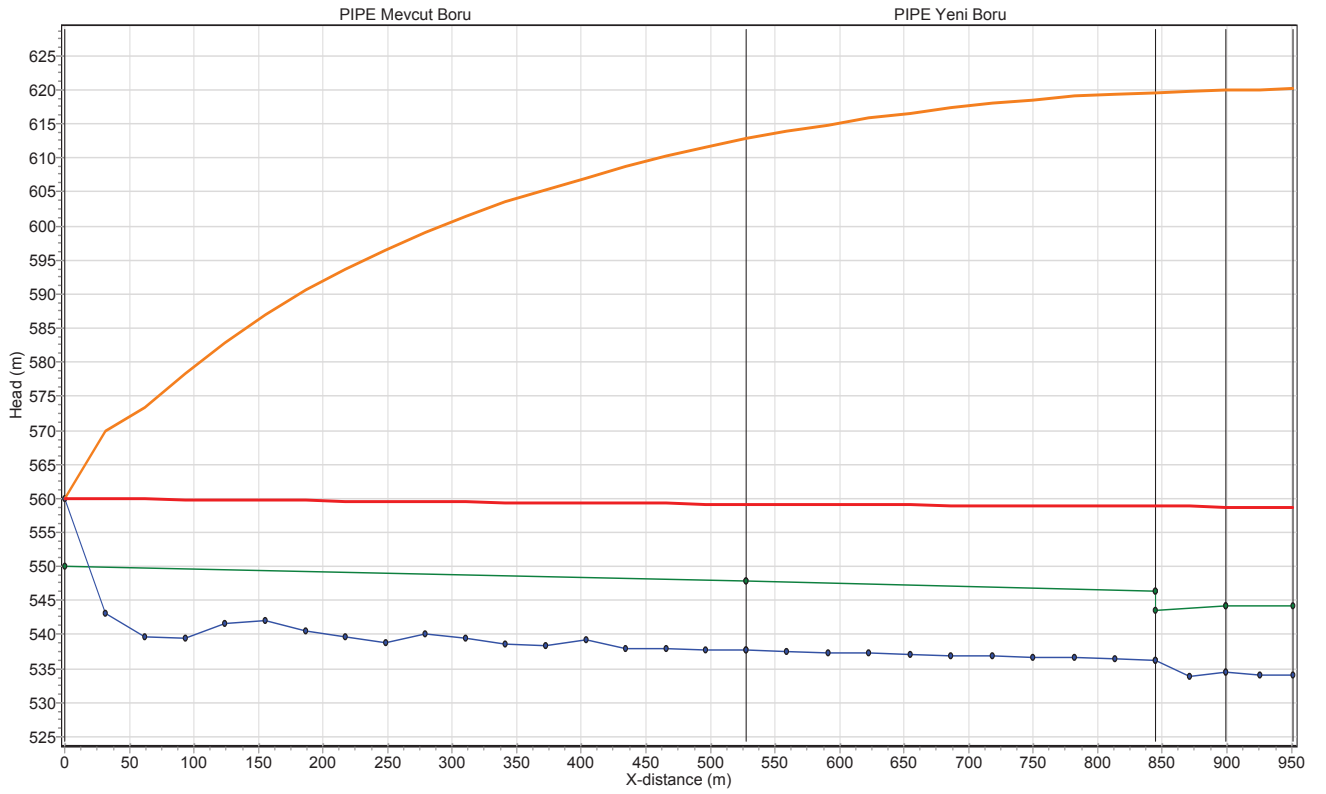
Pressure min (MARAS IS)

Pressure max (MARAS IS)

Pressure 0.00s (MARAS IS)

AL DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALİ FENERCİOĞLU\MARAS İCMESUY-KURSAT KARAPINAR\3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdi

3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17



Labels

Profile (MARAS IS)

Head min (MARAS IS)

Head max (MARAS IS)

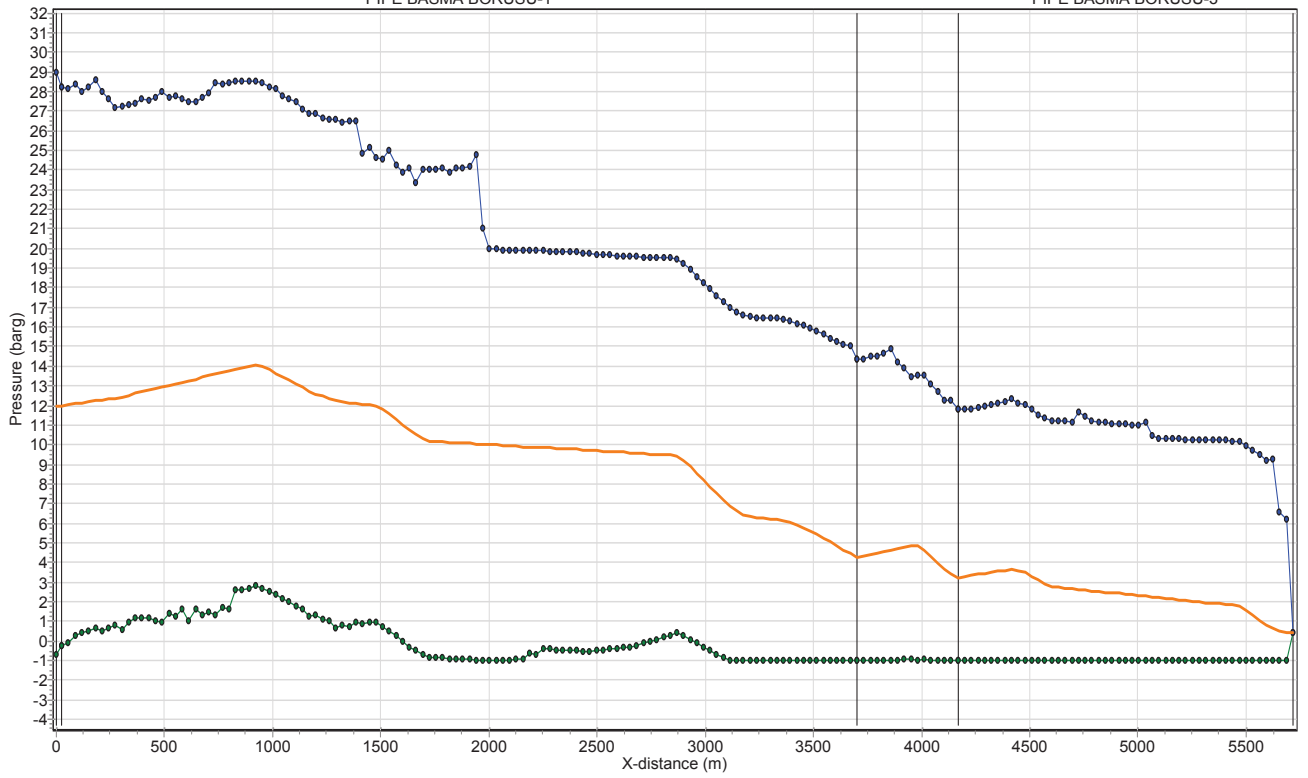
Head 0.00s (MARAS IS)

AL DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALİ FENERCİOĞLU\MARAS İCMESUY-KURSAT KARAPINAR\3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdi

3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



Labels

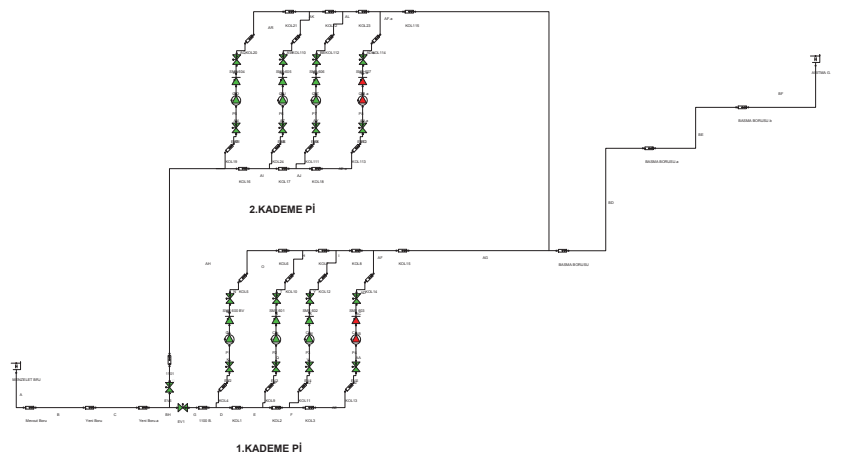
Pressure min (MARAS IS)

Pressure max (MARAS IS)

Pressure 0.00s (MARAS IS)

AL DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALİ FENERCİOĞLU\MARAS İCMESUY-KURSAT KARAPINAR\3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wdi

3.1.2.8.000000.14504202-00000002-00-00-17-000



3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 06:05:34

Case : 3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

Title: 3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

Case description:

=====

3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

H-scheme connectivity:

=====

lhs H-node	H-component	rhs H-node
BF	BOUNDH ARITMA G.	
A	BOUNDH MENZELET BRJ	
L	CHECKV C1	M
R	CHECKV C2	S
W	CHECKV C3	X
AB	CHECKV C4	AC
AO	CHECKV C5	AP
AU	CHECKV C6	AV
AZ	CHECKV C7	BA
AB.a	CHECKV C8	AC.a
G	PIPE 1100 B.	D
□	PIPE 1101	AH
AG	PIPE BASMA BORUSU-1	BD
BD	PIPE BASMA BORUSU-2	BE
BE	PIPE BASMA BORUSU-3	BF
AF.a	PIPE KOL115	AG
AF	PIPE KOL15	AG
A	PIPE Mevcut Boru	B
B	PIPE Yeni Boru	C
C	PIPE Yeni Boru.a	BH
D	PRIGID KOL1	E
T	PRIGID KOL10	H
F	PRIGID KOL11	U
AW	PRIGID KOL110	AK
AJ	PRIGID KOL111	AX
BB	PRIGID KOL112	AL
AE.a	PRIGID KOL113	BC
AD.a	PRIGID KOL114	AF.a
Y	PRIGID KOL12	I
AE	PRIGID KOL13	Z

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

AD	PRIGID	KOL14	AF
AH	PRIGID	KOL16	AI
AI	PRIGID	KOL17	AJ
AJ	PRIGID	KOL18	AE.a
AH	PRIGID	KOL19	AM
E	PRIGID	KOL2	F
AQ	PRIGID	KOL20	AR
AR	PRIGID	KOL21	AK
AK	PRIGID	KOL22	AL
AL	PRIGID	KOL23	AF.a
AI	PRIGID	KOL24	AS
F	PRIGID	KOL3	AE
D	PRIGID	KOL4	J
N	PRIGID	KOL5	O
O	PRIGID	KOL6	H
H	PRIGID	KOL7	I
I	PRIGID	KOL8	AF
E	PRIGID	KOL9	P
K	PUMP	P1	L
Q	PUMP	P2	R
V	PUMP	P3	W
AA	PUMP	P4	AB
AN	PUMP	P5	AO
AT	PUMP	P6	AU
AY	PUMP	P7	AZ
AA.a	PUMP	P8	AB.a
BH	VALVE	EV1	G
BC	VALVE	EV10	AA.a
J	VALVE	EV2	K
P	VALVE	EV3	Q
U	VALVE	EV4	V
Z	VALVE	EV5	AA
BH	VALVE	EV6	□
AM	VALVE	EV7	AN
AS	VALVE	EV8	AT
AX	VALVE	EV9	AY
M	VALVE	SMS 600 BV	N
S	VALVE	SMS 601	T
X	VALVE	SMS 602	Y
AC	VALVE	SMS 603	AD
AP	VALVE	SMS 604	AQ
AV	VALVE	SMS 605	AW
BA	VALVE	SMS 606	BB
AC.a	VALVE	SMS 607	AD.a

H-node heights:

=====

H-node	height
	[m]
□	544.250

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

A	550.000
AA	544.250
AA.a	544.250
AB	544.250
AB.a	544.250
AC	544.250
AC.a	544.250
AD	544.250
AD.a	544.250
AE	544.250
AE.a	544.250
AF	544.250
AF.a	544.250
AG	544.250
AH	544.250
AI	544.250
AJ	544.250
AK	544.250
AL	544.250
AM	544.250
AN	544.250
AO	544.250
AP	544.250
AQ	544.250
AR	544.250
AS	544.250
AT	544.250
AU	544.250
AV	544.250
AW	544.250
AX	544.250
AY	544.250
AZ	544.250
B	547.800
BA	544.250
BB	544.250
BC	544.250
BD	620.010
BE	630.180
BF	657.850
BH	544.250
C	546.450
D	544.250
E	544.250
F	544.250
G	544.250
H	544.250
I	544.250
J	544.250
K	544.250
L	544.250
M	544.250

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

N	544.250
O	544.250
P	544.250
Q	544.250
R	544.250
S	544.250
T	544.250
U	544.250
V	544.250
W	544.250
X	544.250
Y	544.250
Z	544.250

Pipe profiles:

PIPE	1100 B.	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			23.150	544.25

PIPE	1101	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			51.700	544.25

PIPE	BASMA BORUSU-1	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			24.730	544.03
			74.190	542.88
			241.93	540.47
			905.17	521.95
			1162.8	536.76
			1287.9	541.48
			1434.8	542.87
			1493.5	545.64
			1611.2	556.25
			1678.1	560.61
			1708.1	561.37
			2113.4	563.79
			2262.5	564.32
			2851.7	568.07
			3095.7	594.62
			3156.7	598.90
			3349.6	601.52
			3496.7	608.80
			3676.3	620.01

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

PIPE BASMA BORUSU-2 :

X-distance	Height
[m]	[m]
0.0000	620.01
288.72	613.40
400.36	625.94
466.43	630.18

PIPE BASMA BORUSU-3 :

X-distance	Height
[m]	[m]
0.0000	630.18
256.23	625.62
312.25	627.71
424.29	634.60
1291.3	643.85
1319.4	644.85
1423.5	654.15
1495.1	657.30
1549.4	657.85

PRIGID KOL1 :

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL10 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL11 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL110 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL111 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL112 :

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL113 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL114 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PIPE KOL115 :

X-distance	Height
[m]	[m]
0.0000	544.25
49.520	544.25

PRIGID KOL12 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL13 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL14 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PIPE KOL15 :

X-distance	Height
[m]	[m]
0.0000	544.25
25.380	544.25

PRIGID KOL16 :

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

PRIGID	KOL17	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL18	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL19	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PRIGID	KOL2	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL20	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25
PRIGID	KOL21	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL22	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL23	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL24	:		
			X-distance	Height
			[m]	[m]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
0.0000 544.25
7.1000 544.25

PRIGID KOL3 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL4 :
X-distance Height
[m] [m]
0.0000 544.25
7.1000 544.25

PRIGID KOL5 :
X-distance Height
[m] [m]
0.0000 544.25
15.200 544.25

PRIGID KOL6 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL7 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL8 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL9 :
X-distance Height
[m] [m]
0.0000 544.25
7.1000 544.25

PIPE Mevcut Boru :
X-distance Height
[m] [m]
0.0000 550.00
527.65 547.80

PIPE Yeni Boru :

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

X-distance	Height
[m]	[m]
0.0000	547.80
317.35	546.45

PIPE Yeni Boru.a :

X-distance	Height
[m]	[m]
0.0000	546.45
0.0000	543.45
54.490	544.25

Fluid specifications:

=====

Fluid name	:	water	[-]
density	:	1000.	[kg/m3]
bulk modulus	:	0.2100E+10	[N/m2]
vapour pressure	:	0.1707E-01	[bar.a]
kinematic viscosity	:	0.1000E-05	[m2/s]

Physical constants:

=====

gravitational acceleration	:	9.810	[m/s2]
atmospheric pressure	:	1.014	[bar.a]

Time parameters

=====

time step	:	0.3000E-01	[s]
simulation end time	:	60.00	[s]

H-component input specifications:

=====

BOUNDH	ARITMA G.	-	Model name:	
	Comment	:		S: 659.00 m
	Keywords	:		
	Reference Id	:		
	Pressure head at t = 0 [s]	:	662.0	[m]
BOUNDH	MENZELET BRJ	-	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Pressure head at t = 0 [s]	:	560.0	[m]
CHECKV	C1	delta_p	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Inner diameter	:	600.0	[mm]
	Loss coefficient	:	1.600	[-]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C2 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C3 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C4 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Closed

CHECKV C5 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C6 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C7 delta_p Model name:
Comment :
Keywords :
Reference Id :

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C8 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Closed

PIPE 1100 B. Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter [mm]
 [-]
 Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 2
 Tee; flow through branch 0.900

PIPE 1101 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter [mm]
 [-]
 Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 2
 Tee; flow through branch 0.900

PIPE BASMA BORUSU-1 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01 66
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300
 Tee; flow through branch 0.900

PIPE BASMA BORUSU-2 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01 11
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300
 Tee; flow through branch 0.900

PIPE BASMA BORUSU-3 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Inner diameter	:	1692.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	17.50	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	17
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	

PIPE

KOL115

Pipe_Xi

Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Waterhammer	
Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PIPE

KOL15

Pipe_Xi

Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Waterhammer	
Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200
Elbow 45 degr; R=1.5D	0.120

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE Mevcut Boru Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1495. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 14.30 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200 1
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PIPE Yeni Boru Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200 1
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE Yeni Boru.a Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
Calculation mode: Waterhammer

Inner diameter	:	1692.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	17.50	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	1
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL1 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL10 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL11 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number
 Diameter
 [-]
 [mm]
 Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL110 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number
 Diameter
 [-]
 [mm]
 Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL111 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL112 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 600.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL113 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL114	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:	St	
	Calculation mode:		Rigid column	
	Inner diameter	:	600.0	[mm]
	Wall roughness	:	0.1500	[mm]
	Wall thickness	:	11.00	[mm]
	Young's modulus	:	0.2100E+12	[N/m2]
	local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL12	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:	St	
	Calculation mode:		Rigid column	
	Inner diameter	:	600.0	[mm]
	Wall roughness	:	0.1500	[mm]
	Wall thickness	:	11.00	[mm]
	Young's modulus	:	0.2100E+12	[N/m2]
	local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL13	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL14 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL16 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL17 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number
 Diameter
 [-]
 [mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL18 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number
 Diameter
 [-]
 [mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL19 Pipe_Xi Model name:
 Comment :

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL2 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900

PRIGID KOL20 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 600.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL21 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL22 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL23 Pipe_Xi Model name:

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL24 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL3 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL4 Pipe_Xi Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 700.0 [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL5 Pipe_Xi Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 600.0 [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

PRIGID KOL6 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL7 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL8 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL9 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	700.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PUMP P1 Model name:

Comment	:	
Keywords	:	
Reference Id	:	KSB Omega 300-700 A
Characteristic type	:	QHE
QHE_table	:	Table
	Discharge	Pump head
	[l/s]	[m]
	0.0000	170.00
	250.00	159.60
	350.00	150.00
	390.00	146.00
	500.00	134.00
	565.00	125.00
	600.00	120.00
	655.00	110.00
QHE_table	:	Table
	Discharge	Efficiency
	[l/s]	[%]
	0.0000	0.0000

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter	:	Table	
Suter	:	Table	
Rated speed	:	1450.	[rpm]
Q in best point of eff.	:		[l/s]
H in best point of eff.	:		[m]
T in best point of eff.	:		[kNm]
Initial setting	:	Discharge	
Initial speed	:		[rpm]
Initial suction head	:		[m]
Initial pressure head	:		[m]
Initial discharge	:	500.0	[l/s]
Initial relative frequency	:		[%]
Speed-Torque char. of motor	:	Table	
Polar moment of inertia	:	30.00	[kgm2]
Drive type	:	Trip	
Trip time	:	0.000	[s]
Action table speed	:	Table	
Action table motorfreq.	:	Table	
Minimum speed for tripping	:	20.00	[rpm]
Minimum rel.freq. for tripping:	:		[%]
Required speed	:		[rpm]
Minimum speed	:		[rpm]
Maximum speed	:		[rpm]
Maximum power	:		[kW]
Level ON	:		[m]
Level OFF	:		[m]
Start time (0 to max)	:		[s]
Stop time (max to 0)	:		[s]

PUMP

P2

Model name:

Comment	:	
Keywords	:	
Reference Id	:	KSB Omega 300-700 A
Characteristic type	:	QHE
QHE_table	:	Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

QHE_table	: Table	
	Discharge	Efficiency
	[l/s]	[%]
	0.0000	0.0000
	250.00	74.000
	350.00	82.000
	390.00	84.000
	500.00	84.500
	565.00	84.000
	600.00	82.000
	655.00	78.000
Suter	: Table	
Suter	: Table	
Rated speed	: 1450.	[rpm]
Q in best point of eff.	:	[l/s]
H in best point of eff.	:	[m]
T in best point of eff.	:	[kNm]
Initial setting	: Discharge	
Initial speed	:	[rpm]
Initial suction head	:	[m]
Initial pressure head	:	[m]
Initial discharge	: 500.0	[l/s]
Initial relative frequency	:	[%]
Speed-Torque char. of motor	: Table	
Polar moment of inertia	: 30.00	[kgm2]
Drive type	: Trip	
Trip time	: 0.000	[s]
Action table speed	: Table	
Action table motorfreq.	: Table	
Minimum speed for tripping	: 20.00	[rpm]
Minimum rel.freq. for tripping:		[%]
Required speed	:	[rpm]
Minimum speed	:	[rpm]
Maximum speed	:	[rpm]
Maximum power	:	[kW]
Level ON	:	[m]
Level OFF	:	[m]
Start time (0 to max)	:	[s]
Stop time (max to 0)	:	[s]

PUMP

P3

Model name:

Comment	:
Keywords	:
Reference Id	: KSB Omega 300-700 A
Characteristic type	: QHE
QHE_table	: Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table	:	Table	
		Discharge	Efficiency
		[l/s]	[%]
		0.0000	0.0000
		250.00	74.000
		350.00	82.000
		390.00	84.000
		500.00	84.500
		565.00	84.000
		600.00	82.000
		655.00	78.000

Suter	:	Table	
Suter	:	Table	
Rated speed	:	1450.	[rpm]
Q in best point of eff.	:		[l/s]
H in best point of eff.	:		[m]
T in best point of eff.	:		[kNm]
Initial setting	:	Discharge	
Initial speed	:		[rpm]
Initial suction head	:		[m]
Initial pressure head	:		[m]
Initial discharge	:	500.0	[l/s]
Initial relative frequency	:		[%]
Speed-Torque char. of motor	:	Table	
Polar moment of inertia	:	30.00	[kgm2]
Drive type	:	Trip	
Trip time	:	0.000	[s]
Action table speed	:	Table	
Action table motorfreq.	:	Table	
Minimum speed for tripping	:	20.00	[rpm]
Minimum rel.freq. for tripping:	:		[%]
Required speed	:		[rpm]
Minimum speed	:		[rpm]
Maximum speed	:		[rpm]
Maximum power	:		[kW]
Level ON	:		[m]
Level OFF	:		[m]
Start time (0 to max)	:		[s]
Stop time (max to 0)	:		[s]

PUMP	P4	Model name:	
	Comment	:	
	Keywords	:	
	Reference Id	:	KSB Omega 300-700 A
	Characteristic type	:	QHE
	QHE_table	:	Table
		Discharge	Pump head
		[l/s]	[m]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table	: Table	
	Discharge	Efficiency
	[l/s]	[%]
	0.0000	0.0000
	250.00	74.000
	350.00	82.000
	390.00	84.000
	500.00	84.500
	565.00	84.000
	600.00	82.000
	655.00	78.000
Suter	: Table	
Suter	: Table	
Rated speed	: 1450.	[rpm]
Q in best point of eff.	:	[l/s]
H in best point of eff.	:	[m]
T in best point of eff.	:	[kNm]
Initial setting	: Speed	
Initial speed	: 0.000	[rpm]
Initial suction head	:	[m]
Initial pressure head	:	[m]
Initial discharge	: 500.0	[l/s]
Initial relative frequency	:	[%]
Speed-Torque char. of motor	: Table	
Polar moment of inertia	: 30.00	[kgm2]
Drive type	: Trip	
Trip time	: 0.000	[s]
Action table speed	: Table	
Action table motorfreq.	: Table	
Minimum speed for tripping	: 20.00	[rpm]
Minimum rel.freq. for tripping:		[%]
Required speed	:	[rpm]
Minimum speed	:	[rpm]
Maximum speed	:	[rpm]
Maximum power	:	[kW]
Level ON	:	[m]
Level OFF	:	[m]
Start time (0 to max)	:	[s]
Stop time (max to 0)	:	[s]

PUMP P5 Model name:
Comment :
Keywords :
Reference Id : KSB Omega 300-700 A

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Characteristic type	: QHE	
QHE_table	: Table	
	Discharge	Pump head
	[l/s]	[m]
	0.0000	170.00
	250.00	159.60
	350.00	150.00
	390.00	146.00
	500.00	134.00
	565.00	125.00
	600.00	120.00
	655.00	110.00
QHE_table	: Table	
	Discharge	Efficiency
	[l/s]	[%]
	0.0000	0.0000
	250.00	74.000
	350.00	82.000
	390.00	84.000
	500.00	84.500
	565.00	84.000
	600.00	82.000
	655.00	78.000
Suter	: Table	
Suter	: Table	
Rated speed	: 1450.	[rpm]
Q in best point of eff.	:	[l/s]
H in best point of eff.	:	[m]
T in best point of eff.	:	[kNm]
Initial setting	: Discharge	
Initial speed	:	[rpm]
Initial suction head	:	[m]
Initial pressure head	:	[m]
Initial discharge	: 500.0	[l/s]
Initial relative frequency	:	[%]
Speed-Torque char. of motor	: Table	
Polar moment of inertia	: 30.00	[kgm2]
Drive type	: Trip	
Trip time	: 0.000	[s]
Action table speed	: Table	
Action table motorfreq.	: Table	
Minimum speed for tripping	: 20.00	[rpm]
Minimum rel.freq. for tripping:		[%]
Required speed	:	[rpm]
Minimum speed	:	[rpm]
Maximum speed	:	[rpm]
Maximum power	:	[kW]
Level ON	:	[m]
Level OFF	:	[m]
Start time (0 to max)	:	[s]
Stop time (max to 0)	:	[s]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

PUMP

P6

Model name:

Comment :
Keywords :
Reference Id : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table

Suter : Table

Rated speed : 1450. [rpm]

Q in best point of eff. : [l/s]

H in best point of eff. : [m]

T in best point of eff. : [kNm]

Initial setting : Discharge

Initial speed : [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

Trip time : 0.000 [s]

Action table speed : Table

Action table motorfreq. : Table

Minimum speed for tripping : 20.00 [rpm]

Minimum rel.freq. for tripping: [%]

Required speed : [rpm]

Minimum speed : [rpm]

Maximum speed : [rpm]

Maximum power : [kW]

Level ON : [m]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P7

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table

: Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter

: Table

Suter

: Table

Rated speed : 1450. [rpm]

Q in best point of eff. : [l/s]

H in best point of eff. : [m]

T in best point of eff. : [kNm]

Initial setting : Discharge

Initial speed : [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

Trip time : 0.000 [s]

Action table speed : Table

Action table motorfreq. : Table

Minimum speed for tripping : 20.00 [rpm]

Minimum rel.freq. for tripping: [%]

Required speed : [rpm]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Minimum speed : [rpm]
Maximum speed : [rpm]
Maximum power : [kW]
Level ON : [m]
Level OFF : [m]
Start time (0 to max) : [s]
Stop time (max to 0) : [s]

PUMP

P8

Model name:

Comment :
Keywords :
Reference Id : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table
Suter : Table
Rated speed : 1450. [rpm]
Q in best point of eff. : [l/s]
H in best point of eff. : [m]
T in best point of eff. : [kNm]
Initial setting : Speed
Initial speed : 0.000 [rpm]
Initial suction head : [m]
Initial pressure head : [m]
Initial discharge : 500.0 [l/s]
Initial relative frequency : [%]
Speed-Torque char. of motor : Table
Polar moment of inertia : 30.00 [kgm2]
Drive type : Trip
Trip time : 0.000 [s]
Action table speed : Table

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

VALVE EV1 Universal Model name:
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
9.1600	2089.7
29.600	3678.4
49.300	14351.
66.600	32029.
69.400	36300.
84.500	60500.
100.00	96800.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 1100. [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV10 Universal Model name:

Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir
Cavitation table : Table

VALVE EV2 Universal Model name:

Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV3 Universal Model name:

Comment :
Keywords :

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV4 Universal Model name:
Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV5 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE EV6 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open [%]	Kv [m ³ /h/(bar) ^½]
0.0000	0.0000
9.1600	2089.7
29.600	3678.4
49.300	14351.
66.600	32029.
69.400	36300.
84.500	60500.
100.00	96800.

Cv Characteristic : Table

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Xi Characteristic	: Table	
	Position open	Xi
	[%]	[-]
	0.0000	0.15740E+07
	2.5000	3404.0
	5.0000	1532.0
	10.000	663.80
	20.000	221.27
	30.000	73.200
	40.000	28.933
	50.000	11.407
	60.000	4.7660
	70.000	2.2127
	80.000	0.93600
	90.000	0.51067
	94.000	0.45960
	97.000	0.40853
	100.00	0.40000
Inner diameter	: 1100.	[mm]
Initial setting	: Position	
Initial position (open)	: 100.0	[%]
Initial upstream head	:	[m]
Initial downstream head	:	[m]
Initial discharge	:	[l/s]
Initial upstream pressure	:	[barg]
Initial downstream pressure	:	[barg]
Check cavitation	: No	
Cavitation table	: Table	

VALVE	EV7	Universal	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Characteristic type	: Kv	
	Standard type	: Buttrfly	
	Kv Characteristic	: Table	
	Position open	Kv	
	[%]	[m3/h/(bar) ^½]	
	0.0000	0.0000	
	10.700	392.00	
	27.800	2000.0	
	44.400	4713.0	
	63.100	10000.	
	77.700	16000.	
	90.900	24000.	
	100.00	32610.	
	Cv Characteristic	: Table	
	Xi Characteristic	: Table	
	Position open	Xi	
	[%]	[-]	
	0.0000	0.15740E+07	
	2.5000	3404.0	

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV8 Universal Model name:

Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV9 Universal Model name:
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

94.000 0.45960
97.000 0.40853
100.00 0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 600 BV Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 601 Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open [%]	Kv [m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 602 Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 603 Universal Model name: SMS 600

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 604 Universal Model name: SMS 600
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

Kv Characteristic	: Table
	Position open Kv
	[%] [m3/h/(bar)½]
	0.0000 0.0000
	10.800 315.00
	32.000 1573.0
	52.100 4720.0
	66.700 8260.0
	73.100 10000.
	88.900 16000.
	100.00 22000.

Cv Characteristic : Table

Xi Characteristic : Table

	Position open Xi
	[%] [-]
	0.0000 0.19150E+07
	2.5000 3830.0
	5.0000 1723.0
	10.000 746.80
	20.000 248.90
	30.000 82.340
	40.000 32.550
	50.000 12.830
	60.000 5.3620
	70.000 2.4890
	80.000 1.0530
	90.000 0.57450
	94.000 0.51700
	97.000 0.45960
	100.00 0.45000

Inner diameter	: 600.0 [mm]
Initial setting	: Position
Initial position (open)	: 100.0 [%]
Initial upstream head	: [m]
Initial downstream head	: [m]
Initial discharge	: [l/s]
Initial upstream pressure	: [barg]
Initial downstream pressure	: [barg]
Check cavitation	: No
Cavitation table	: Table

VALVE SMS 605 Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

	Position open Kv
	[%] [m3/h/(bar)½]
	0.0000 0.0000
	10.800 315.00

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 606 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

100.00 22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE SMS 607 Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

Calculated pipe data:

=====

PIPE		length [m]	C_calc [m/s]	C_adapt [m/s]	N_elem [-]
PIPE	1100 B.	23.150	1025.	772.	1
PIPE	1101	51.700	1025.	862.	2
PIPE	BASMA BORUSU-1	3679.934	1033.	1031.	119
PIPE	BASMA BORUSU-2	467.344	1033.	1039.	15
PIPE	BASMA BORUSU-3	1550.225	1033.	1033.	50
PRIGID	KOL1	4.250	used as rigid column		
PRIGID	KOL10	15.200	used as rigid column		
PRIGID	KOL11	7.100	used as rigid column		
PRIGID	KOL110	15.200	used as rigid column		
PRIGID	KOL111	7.100	used as rigid column		
PRIGID	KOL112	15.200	used as rigid column		
PRIGID	KOL113	7.100	used as rigid column		
PRIGID	KOL114	15.200	used as rigid column		
PIPE	KOL115	49.520	1025.	825.	2
PRIGID	KOL12	15.200	used as rigid column		
PRIGID	KOL13	7.100	used as rigid column		
PRIGID	KOL14	15.200	used as rigid column		
PIPE	KOL15	25.380	1025.	846.	1
PRIGID	KOL16	4.250	used as rigid column		
PRIGID	KOL17	4.250	used as rigid column		

3.1.2 INPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wir

PRIGID	KOL18	4.250	used as rigid column
PRIGID	KOL19	7.100	used as rigid column
PRIGID	KOL2	4.250	used as rigid column
PRIGID	KOL20	15.200	used as rigid column
PRIGID	KOL21	4.250	used as rigid column
PRIGID	KOL22	4.250	used as rigid column
PRIGID	KOL23	4.250	used as rigid column
PRIGID	KOL24	7.100	used as rigid column
PRIGID	KOL3	4.250	used as rigid column
PRIGID	KOL4	7.100	used as rigid column
PRIGID	KOL5	15.200	used as rigid column
PRIGID	KOL6	4.250	used as rigid column
PRIGID	KOL7	4.250	used as rigid column
PRIGID	KOL8	4.250	used as rigid column
PRIGID	KOL9	7.100	used as rigid column
PIPE	Mevcut Boru	527.655	1013. 1035. 17
PIPE	Yeni Boru	317.353	1033. 1058. 10
PIPE	Yeni Boru.a	57.496	1033. 958. 2

Active H-components:

=====

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 06:05:34

Case : 3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

Title: 3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

Case description:

=====

3.1.2 K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17

Steady state results:

Pipes:

Name v	length [m]	lambda [-]	wall rough. [mm]	c_calc [m/s]	c_adapt [m/s]	N_elem [-]	Q [l/s]
1100 B. 1.578	23.15	0.0420	0.150	1024.70	771.67	1	1500.000
1101 1.578	51.70	0.0262	0.150	1024.70	861.67	2	1500.000
BASMA BORUSU-1 1.334	3679.93	0.0149	0.150	1033.29	1030.79	119	3000.000
BASMA BORUSU-2 1.334	467.34	0.0157	0.150	1033.29	1038.54	15	3000.000
BASMA BORUSU-3 1.334	1550.22	0.0140	0.150	1033.29	1033.48	50	3000.000
KOL115 1.578	49.52	0.0201	0.150	1024.70	825.33	2	1500.000
KOL15 1.578	25.38	0.0265	0.150	1024.70	846.00	1	1500.000
Mevcut Boru 1.709	527.65	0.0170	0.150	1013.25	1034.62	17	3000.000
Yeni Boru 1.334	317.35	0.0158	0.150	1033.29	1057.84	10	3000.000
Yeni Boru.a 1.334	57.50	0.0249	0.150	1033.29	958.26	2	3000.000

Discharges and velocities through H-components:

H-component	discharge [l/s]	velocity [m/s]

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

BOUNDH	ARITMA G.	-3000.000	
BOUNDH	MENZELET BRJ	3000.000	
CHECKV	C1	500.000	1.768
CHECKV	C2	500.000	1.768
CHECKV	C3	500.000	1.768
CHECKV	C4	0.000	
CHECKV	C5	500.000	1.768
CHECKV	C6	500.000	1.768
CHECKV	C7	500.000	1.768
CHECKV	C8	0.000	
PRIGID	KOL1	1000.000	1.052
PRIGID	KOL10	500.000	1.768
PRIGID	KOL11	500.000	1.299
PRIGID	KOL110	500.000	1.768
PRIGID	KOL111	500.000	1.299
PRIGID	KOL112	500.000	1.768
PRIGID	KOL113	0.000	
PRIGID	KOL114	0.000	
PRIGID	KOL12	500.000	1.768
PRIGID	KOL13	0.000	
PRIGID	KOL14	0.000	
PRIGID	KOL16	1000.000	1.052
PRIGID	KOL17	500.000	0.526
PRIGID	KOL18	0.000	
PRIGID	KOL19	500.000	1.299
PRIGID	KOL2	500.000	0.526
PRIGID	KOL20	500.000	1.768
PRIGID	KOL21	500.000	0.526
PRIGID	KOL22	1000.000	1.052
PRIGID	KOL23	1500.000	1.578
PRIGID	KOL24	500.000	1.299
PRIGID	KOL3	0.000	
PRIGID	KOL4	500.000	1.299
PRIGID	KOL5	500.000	1.768
PRIGID	KOL6	500.000	0.526
PRIGID	KOL7	1000.000	1.052
PRIGID	KOL8	1500.000	1.578
PRIGID	KOL9	500.000	1.299
PUMP	P1	500.000	
PUMP	P2	500.000	
PUMP	P3	500.000	
PUMP	P4	0.000	
PUMP	P5	500.000	
PUMP	P6	500.000	
PUMP	P7	500.000	
PUMP	P8	0.000	
VALVE	EV1	1500.000	1.578
VALVE	EV10	0.000	
VALVE	EV2	500.000	1.299
VALVE	EV3	500.000	1.299
VALVE	EV4	500.000	1.299
VALVE	EV5	0.000	

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

VALVE	EV6	1500.000	1.578
VALVE	EV7	500.000	1.299
VALVE	EV8	500.000	1.299
VALVE	EV9	500.000	1.299
VALVE	SMS 600 BV	500.000	1.768
VALVE	SMS 601	500.000	1.768
VALVE	SMS 602	500.000	1.768
VALVE	SMS 603	0.000	
VALVE	SMS 604	500.000	1.768
VALVE	SMS 605	500.000	1.768
VALVE	SMS 606	500.000	1.768
VALVE	SMS 607	0.000	

Pressures and heads in H-nodes:

H-node	pressure [barg]	head [m]
□	1.42	558.731
A	0.98	560.000
AA	1.40	558.594
AA.a	1.40	558.550
AB	1.40	558.594
AB.a	1.40	558.550
AC	12.00	666.583
AC.a	12.00	666.620
AD	12.00	666.583
AD.a	12.00	666.620
AE	1.40	558.594
AE.a	1.40	558.550
AF	12.00	666.583
AF.a	12.00	666.620
AG	11.99	666.505
AH	1.40	558.575
AI	1.40	558.555
AJ	1.40	558.550
AK	12.01	666.685
AL	12.00	666.665
AM	1.39	558.438
AN	1.38	558.407
AO	12.07	667.304
AP	12.04	667.049
AQ	12.04	666.981
AR	12.01	666.690
AS	1.39	558.418
AT	1.38	558.387
AU	12.07	667.299
AV	12.04	667.044
AW	12.03	666.976
AX	1.38	558.413
AY	1.38	558.382
AZ	12.06	667.279

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

B	1.10	559.109
BA	12.04	667.024
BB	12.03	666.956
BC	1.40	558.550
BD	4.27	663.557
BE	3.23	663.164
BF	0.40	662.000
BH	1.42	558.763
C	1.21	558.840
D	1.41	558.619
E	1.40	558.599
F	1.40	558.594
G	1.42	558.731
H	12.00	666.648
I	12.00	666.628
J	1.39	558.482
K	1.39	558.451
L	12.06	667.267
M	12.04	667.012
N	12.03	666.943
O	12.00	666.653
P	1.39	558.462
Q	1.39	558.431
R	12.06	667.262
S	12.04	667.007
T	12.03	666.938
U	1.39	558.457
V	1.39	558.426
W	12.06	667.242
X	12.04	666.987
Y	12.03	666.918
Z	1.40	558.594

Additional H-component output:

PUMP	P1	Pump speed	1336.344	[rpm]
		Fluid torque	4.523	[kNm]
		Motor torque	4.523	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.327	[%]
		Power	632.941	[kW]
		Energy	0.000	[kJ]
PUMP	P2	Pump speed	1336.415	[rpm]
		Fluid torque	4.523	[kNm]
		Motor torque	4.523	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.327	[%]
		Power	633.025	[kW]
		Energy	0.000	[kJ]
PUMP	P3	Pump speed	1336.344	[rpm]
		Fluid torque	4.523	[kNm]
		Motor torque	4.523	[kNm]

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

		ON/OFF	1.000	[-]
		Efficiency	84.327	[%]
		Power	632.941	[kW]
		Energy	0.000	[kJ]
PUMP	P4	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	84.327	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
PUMP	P5	Pump speed	1336.733	[rpm]
		Fluid torque	4.525	[kNm]
		Motor torque	4.525	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.329	[%]
		Power	633.404	[kW]
		Energy	0.000	[kJ]
PUMP	P6	Pump speed	1336.804	[rpm]
		Fluid torque	4.525	[kNm]
		Motor torque	4.525	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.329	[%]
		Power	633.489	[kW]
		Energy	0.000	[kJ]
PUMP	P7	Pump speed	1336.733	[rpm]
		Fluid torque	4.525	[kNm]
		Motor torque	4.525	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.329	[%]
		Power	633.404	[kW]
		Energy	0.000	[kJ]
PUMP	P8	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	84.329	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
VALVE	EV1	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV10	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV2	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV3	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV4	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV6	Valve position (open)	100.000	[%]

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

		Pressure ratio Xf	0.001	[-]
VALVE	EV7	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV8	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV9	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 600 BV	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 601	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 602	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 603	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	SMS 604	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 605	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 606	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 607	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]

Extreme values in pipes:

Head:

Pipe location	minimum [m]	time [s]	location [m]	maximum [m]	time [s]	[m]
1100 B. 23.15	534.088	36.480	23.15	620.054	1.800	
1101 51.70	534.088	36.510	25.85	620.211	1.830	
BASMA BORUSU-1 154.62	540.733	30.060	711.25	833.536	21.210	
BASMA BORUSU-2 155.78	603.430	32.730	280.41	767.824	24.780	
BASMA BORUSU-3 558.08	615.604	49.710	248.04	754.837	16.800	
KOL115 0.00	539.861	31.830	0.00	838.023	21.420	
KOL15 0.00	536.774	30.780	0.00	839.587	21.390	
Mevcut Boru 527.65	537.638	36.660	527.65	612.971	1.410	
Yeni Boru 317.35	536.288	36.570	317.35	619.636	1.710	
Yeni Boru.a 57.50	533.840	52.680	28.75	619.969	1.770	

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

Pressure:

Pipe location [m]	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]
1100 B. 23.15	-0.997	36.480	23.15	7.436	1.800
1101 51.70	-0.997	36.510	25.85	7.452	1.830
BASMA BORUSU-1 154.62	-0.997	5.550	3679.93	28.627	21.210
BASMA BORUSU-2 155.78	-0.997	5.550	0.00	14.850	24.780
BASMA BORUSU-3 248.04	-0.997	4.920	0.00	12.371	24.240
KOL115 0.00	-0.431	31.830	0.00	28.819	21.420
KOL15 0.00	-0.733	30.780	0.00	28.973	21.390
Mevcut Boru 527.65	-0.997	30.750	62.08	6.393	1.410
Yeni Boru 317.35	-0.997	36.660	0.00	7.180	1.710
Yeni Boru.a 28.75	-0.997	36.570	0.00	7.454	1.740

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.1138E-03	52.560	23.15
1101	0.1672E-03	48.930	51.70
BASMA BORUSU-1	0.5342E-01	10.080	3679.93
BASMA BORUSU-2	0.5302E-01	10.080	0.00
BASMA BORUSU-3	0.2640E-01	36.600	0.00
KOL115	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.6441E-04	30.690	93.12
Yeni Boru	0.2114E-03	40.770	285.62
Yeni Boru.a	0.1803E-03	52.830	0.00

Extreme discharges through H-components:

H-component	minimum [l/s]	time [s]	maximum [l/s]	time [s]
BOUNDH ARITMA G.	-3655.684	26.940	3825.907	15.840
BOUNDH MENZELET BRJ	-561.802	51.750	3000.005	0.720

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

CHECKV	C1	0.000	10.800	500.000	0.000
CHECKV	C2	0.000	10.560	500.000	0.000
CHECKV	C3	0.000	10.530	500.000	0.000
CHECKV	C4	0.000	0.180	64.652	8.430
CHECKV	C5	0.000	11.070	500.000	0.000
CHECKV	C6	0.000	10.830	500.000	0.000
CHECKV	C7	0.000	10.800	500.000	0.000
CHECKV	C8	0.000	0.390	69.936	1.860
PRIGID	KOL1	0.000	42.420	1000.000	0.000
PRIGID	KOL10	0.000	10.560	500.000	0.000
PRIGID	KOL11	0.000	26.880	500.000	0.000
PRIGID	KOL110	0.000	10.830	500.000	0.000
PRIGID	KOL111	0.000	56.250	500.000	0.000
PRIGID	KOL112	0.000	10.800	500.000	0.000
PRIGID	KOL113	0.000	2.640	69.936	1.860
PRIGID	KOL114	0.000	0.000	69.936	1.860
PRIGID	KOL12	0.000	10.530	500.000	0.000
PRIGID	KOL13	0.000	2.130	64.652	8.430
PRIGID	KOL14	0.000	0.000	64.652	8.430
PRIGID	KOL16	0.000	54.870	1000.000	0.000
PRIGID	KOL17	0.000	46.050	500.000	0.000
PRIGID	KOL18	0.000	2.640	69.936	1.860
PRIGID	KOL19	0.000	55.020	500.000	0.000
PRIGID	KOL2	0.000	14.550	500.000	0.000
PRIGID	KOL20	0.000	10.800	500.000	0.000
PRIGID	KOL21	0.000	10.800	500.000	0.000
PRIGID	KOL22	0.000	11.070	1000.000	0.000
PRIGID	KOL23	0.000	10.830	1500.000	0.000
PRIGID	KOL24	0.000	44.310	500.000	0.000
PRIGID	KOL3	0.000	2.130	64.652	8.430
PRIGID	KOL4	0.000	10.530	500.000	0.000
PRIGID	KOL5	0.000	10.530	500.000	0.000
PRIGID	KOL6	0.000	10.530	500.000	0.000
PRIGID	KOL7	0.000	10.590	1000.000	0.000
PRIGID	KOL8	0.000	14.370	1500.000	0.000
PRIGID	KOL9	0.000	21.960	500.000	0.000
PUMP	P1	0.000	44.310	500.000	0.000
PUMP	P2	0.000	10.560	500.000	0.000
PUMP	P3	0.000	10.530	500.000	0.000
PUMP	P4	0.000	3.540	64.652	8.430
PUMP	P5	0.000	36.930	500.000	0.000
PUMP	P6	0.000	10.830	500.000	0.000
PUMP	P7	0.000	10.800	500.000	0.000
PUMP	P8	0.000	4.590	69.936	1.860
VALVE	EV1	-134.685	35.670	1500.000	0.000
VALVE	EV10	0.000	2.640	69.936	1.860
VALVE	EV2	0.000	44.310	500.000	0.000
VALVE	EV3	0.000	10.560	500.000	0.000
VALVE	EV4	0.000	10.530	500.000	0.000
VALVE	EV5	0.000	2.130	64.652	8.430
VALVE	EV6	-168.194	31.770	1512.524	0.060
VALVE	EV7	0.000	36.930	500.000	0.000

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

VALVE	EV8	0.000	10.830	500.000	0.000
VALVE	EV9	0.000	10.800	500.000	0.000
VALVE	SMS 600 BV	0.000	10.530	500.000	0.000
VALVE	SMS 601	0.000	10.560	500.000	0.000
VALVE	SMS 602	0.000	10.530	500.000	0.000
VALVE	SMS 603	0.000	0.180	64.652	8.430
VALVE	SMS 604	0.000	10.800	500.000	0.000
VALVE	SMS 605	0.000	10.830	500.000	0.000
VALVE	SMS 606	0.000	10.800	500.000	0.000
VALVE	SMS 607	0.000	0.390	69.936	1.860

Extreme pressure heads in H-nodes:

H-node	minimum [m]	time [s]	maximum [m]	time [s]
□	534.539	52.800	619.955	1.770
A	560.000	0.000	560.000	0.000
AA	534.088	36.480	619.439	1.800
AA.a	534.088	36.480	619.636	1.830
AB	534.104	52.860	618.545	1.740
AB.a	534.106	56.610	618.515	1.710
AC	539.319	30.780	839.587	21.390
AC.a	537.168	31.830	838.023	21.420
AD	539.318	30.780	839.587	21.390
AD.a	537.168	31.830	838.023	21.420
AE	534.088	36.480	619.846	1.800
AE.a	534.088	36.480	620.018	1.830
AF	536.774	30.780	839.587	21.390
AF.a	539.861	31.830	838.023	21.420
AG	541.546	30.750	832.056	21.360
AH	534.088	36.480	620.211	1.830
AI	534.088	36.480	620.173	1.830
AJ	534.088	36.480	620.109	1.830
AK	538.854	31.830	838.023	21.420
AL	539.262	31.830	838.023	21.420
AM	534.088	36.480	620.289	1.830
AN	534.088	36.480	620.278	1.830
AO	534.142	56.640	667.304	0.000
AP	536.029	31.830	838.023	21.420
AQ	536.029	31.830	838.023	21.420
AR	538.637	31.830	838.023	21.420
AS	534.088	36.480	620.251	1.830
AT	534.088	36.480	620.240	1.830
AU	534.141	56.640	667.299	0.000
AV	536.561	31.830	838.023	21.420
AW	536.560	31.830	838.023	21.420
AX	534.088	36.480	620.188	1.830
AY	534.088	36.480	620.177	1.830
AZ	534.141	56.640	667.279	0.000
B	537.638	36.660	612.971	1.410
BA	536.972	31.830	838.023	21.420

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

BB	536.972	31.830	838.023	21.420
BC	534.088	36.480	619.637	1.830
BD	609.848	5.550	766.356	24.930
BE	620.018	4.920	750.298	49.230
BF	662.000	0.000	662.000	0.000
BH	534.539	52.800	619.969	1.770
C	536.288	36.570	619.636	1.710
D	534.088	36.480	620.054	1.800
E	534.088	36.480	620.012	1.800
F	534.088	36.480	619.944	1.800
G	534.539	52.800	619.955	1.770
H	537.777	30.780	839.587	21.390
I	537.372	30.780	839.587	21.390
J	534.088	36.480	620.134	1.800
K	534.088	36.480	620.123	1.800
L	534.151	52.890	667.267	0.000
M	540.540	30.780	839.587	21.390
N	540.539	30.780	839.587	21.390
O	537.989	30.780	839.587	21.390
P	534.088	36.480	620.093	1.800
Q	534.088	36.480	620.081	1.800
R	534.151	52.890	667.262	0.000
S	540.099	30.780	839.587	21.390
T	540.098	30.780	839.587	21.390
U	534.088	36.480	620.026	1.800
V	534.088	36.480	620.015	1.800
W	534.151	52.890	667.242	0.000
X	539.691	30.780	839.587	21.390
Y	539.690	30.780	839.587	21.390
Z	534.088	36.480	619.439	1.800

Extreme pressures in H-nodes:

H-node	minimum [barg]	time [s]	maximum [barg]	time [s]
□	-0.953	52.800	7.427	1.770
A	0.981	0.000	0.981	0.000
AA	-0.997	36.480	7.376	1.800
AA.a	-0.997	36.480	7.395	1.830
AB	-0.995	52.860	7.288	1.740
AB.a	-0.995	56.610	7.285	1.710
AC	-0.484	30.780	28.973	21.390
AC.a	-0.695	31.830	28.819	21.420
AD	-0.484	30.780	28.973	21.390
AD.a	-0.695	31.830	28.819	21.420
AE	-0.997	36.480	7.416	1.800
AE.a	-0.997	36.480	7.433	1.830
AF	-0.733	30.780	28.973	21.390
AF.a	-0.431	31.830	28.819	21.420
AG	-0.265	30.750	28.234	21.360
AH	-0.997	36.480	7.452	1.830

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

AI	-0.997	36.480	7.448	1.830
AJ	-0.997	36.480	7.442	1.830
AK	-0.529	31.830	28.819	21.420
AL	-0.489	31.830	28.819	21.420
AM	-0.997	36.480	7.459	1.830
AN	-0.997	36.480	7.458	1.830
AO	-0.992	56.640	12.072	0.000
AP	-0.806	31.830	28.819	21.420
AQ	-0.807	31.830	28.819	21.420
AR	-0.551	31.830	28.819	21.420
AS	-0.997	36.480	7.456	1.830
AT	-0.997	36.480	7.455	1.830
AU	-0.992	56.640	12.071	0.000
AV	-0.754	31.830	28.819	21.420
AW	-0.754	31.830	28.819	21.420
AX	-0.997	36.480	7.450	1.830
AY	-0.997	36.480	7.448	1.830
AZ	-0.992	56.640	12.069	0.000
B	-0.997	36.660	6.393	1.410
BA	-0.714	31.830	28.819	21.420
BB	-0.714	31.830	28.819	21.420
BC	-0.997	36.480	7.395	1.830
BD	-0.997	5.550	14.357	24.930
BE	-0.997	4.920	11.784	49.230
BF	0.407	0.000	0.407	0.000
BH	-0.953	52.800	7.428	1.770
C	-0.997	36.570	7.180	1.710
D	-0.997	36.480	7.436	1.800
E	-0.997	36.480	7.432	1.800
F	-0.997	36.480	7.426	1.800
G	-0.953	52.800	7.427	1.770
H	-0.635	30.780	28.973	21.390
I	-0.675	30.780	28.973	21.390
J	-0.997	36.480	7.444	1.800
K	-0.997	36.480	7.443	1.800
L	-0.991	52.890	12.068	0.000
M	-0.364	30.780	28.973	21.390
N	-0.364	30.780	28.973	21.390
O	-0.614	30.780	28.973	21.390
P	-0.997	36.480	7.440	1.800
Q	-0.997	36.480	7.439	1.800
R	-0.991	52.890	12.067	0.000
S	-0.407	30.780	28.973	21.390
T	-0.407	30.780	28.973	21.390
U	-0.997	36.480	7.434	1.800
V	-0.997	36.480	7.433	1.800
W	-0.991	52.890	12.065	0.000
X	-0.447	30.780	28.973	21.390
Y	-0.447	30.780	28.973	21.390
Z	-0.997	36.480	7.376	1.800

Extreme values of additional H-component output:

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

H-component	minimum	time [s]	maximum	time [s]
PUMP P1				
Pump speed [rpm]	25.075	60.000	1336.344	0.000
Fluid torque [kNm]	-0.002	32.700	4.523	0.000
Motor torque [kNm]	0.000	0.030	4.523	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.327	0.000
Power [kW]	0.000	0.030	632.941	0.000
Energy [kJ]	0.000	0.000	18.988	0.030
PUMP P2				
Pump speed [rpm]	24.950	60.000	1336.415	0.000
Fluid torque [kNm]	-0.001	32.700	4.523	0.000
Motor torque [kNm]	0.000	0.030	4.523	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.327	0.000
Power [kW]	0.000	0.030	633.025	0.000
Energy [kJ]	0.000	0.000	18.991	0.030
PUMP P3				
Pump speed [rpm]	24.961	60.000	1336.344	0.000
Fluid torque [kNm]	-0.001	32.700	4.523	0.000
Motor torque [kNm]	0.000	0.030	4.523	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.327	0.000
Power [kW]	0.000	0.030	632.941	0.000
Energy [kJ]	0.000	0.000	18.988	0.030
PUMP P4				
Pump speed [rpm]	0.000	0.000	17.377	8.880
Fluid torque [kNm]	-0.031	1.860	0.001	9.000
Motor torque [kNm]	0.000	0.000	0.000	0.000
ON/OFF [-]	0.000	0.000	0.000	0.000
Efficiency [%]	0.000	0.030	84.327	0.000
Power [kW]	0.000	0.000	0.000	0.000
Energy [kJ]	0.000	0.000	0.000	0.000
PUMP P5				
Pump speed [rpm]	24.645	60.000	1336.733	0.000
Fluid torque [kNm]	-0.003	30.840	4.525	0.000
Motor torque [kNm]	0.000	0.030	4.525	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.329	0.000
Power [kW]	0.000	0.030	633.404	0.000
Energy [kJ]	0.000	0.000	19.002	0.030
PUMP P6				
Pump speed [rpm]	24.522	60.000	1336.804	0.000
Fluid torque [kNm]	-0.002	30.840	4.525	0.000
Motor torque [kNm]	0.000	0.030	4.525	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.329	0.000
Power [kW]	0.000	0.030	633.489	0.000
Energy [kJ]	0.000	0.000	19.005	0.030

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

PUMP	P7				
	Pump speed [rpm]	24.528	60.000	1336.733	0.000
	Fluid torque [kNm]	-0.002	30.840	4.525	0.000
	Motor torque [kNm]	0.000	0.030	4.525	0.000
	ON/OFF [-]	0.000	0.030	1.000	0.000
	Efficiency [%]	0.000	0.030	84.329	0.000
	Power [kW]	0.000	0.030	633.404	0.000
	Energy [kJ]	0.000	0.000	19.002	0.030
PUMP	P8				
	Pump speed [rpm]	0.000	0.000	20.074	9.120
	Fluid torque [kNm]	-0.040	1.890	0.001	9.330
	Motor torque [kNm]	0.000	0.000	0.000	0.000
	ON/OFF [-]	0.000	0.000	0.000	0.000
	Efficiency [%]	0.000	0.030	84.329	0.000
	Power [kW]	0.000	0.000	0.000	0.000
	Energy [kJ]	0.000	0.000	0.000	0.000
VALVE	EV1				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.380	0.001	0.000
VALVE	EV10				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.000	0.000	31.830
VALVE	EV2				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.440	0.001	0.000
VALVE	EV3				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.410	0.001	0.000
VALVE	EV4				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.410	0.001	0.000
VALVE	EV5				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.000	0.000	30.780
VALVE	EV6				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.710	0.001	0.000
VALVE	EV7				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.710	0.001	0.000
VALVE	EV8				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.680	0.001	0.000
VALVE	EV9				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.680	0.001	0.000
VALVE	SMS 600 BV				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.440	0.001	0.030
VALVE	SMS 601				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.440	0.001	0.030

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

VALVE	SMS 602				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.440	0.001	0.000
VALVE	SMS 603				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.000	0.000	30.780
VALVE	SMS 604				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.740	0.001	0.000
VALVE	SMS 605				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.740	0.001	0.030
VALVE	SMS 606				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	10.740	0.001	0.000
VALVE	SMS 607				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.000	0.000	31.830

Component messages:

At	0.0000	s	VALVE	EV1	Starts in open phase
At	0.0000	s	VALVE	EV6	Starts in open phase
At	0.0000	s	VALVE	EV2	Starts in open phase
At	0.0000	s	PUMP	P1	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 600 BV	Starts in open phase
At	0.0000	s	VALVE	EV3	Starts in open phase
At	0.0000	s	PUMP	P2	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 601	Starts in open phase
At	0.0000	s	VALVE	EV4	Starts in open phase
At	0.0000	s	PUMP	P3	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 602	Starts in open phase
At	0.0000	s	VALVE	EV5	Starts in open phase
At	0.0000	s	PUMP	P4	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 603	Starts in open phase
At	0.0000	s	VALVE	EV7	Starts in open phase
At	0.0000	s	PUMP	P5	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 604	Starts in open phase
At	0.0000	s	VALVE	EV8	Starts in open phase
At	0.0000	s	PUMP	P6	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 605	Starts in open phase
At	0.0000	s	VALVE	EV9	Starts in open phase
At	0.0000	s	PUMP	P7	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 606	Starts in open phase
At	0.0000	s	VALVE	EV10	Starts in open phase
At	0.0000	s	PUMP	P8	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 607	Starts in open phase
At	0.0000	s	PUMP	P1	Initial pump speed = 1336.344 [rpm]
At	0.0000	s	PUMP	P2	Initial pump speed = 1336.415 [rpm]
At	0.0000	s	PUMP	P3	Initial pump speed = 1336.344 [rpm]
At	0.0000	s	PUMP	P5	Initial pump speed = 1336.733 [rpm]
At	0.0000	s	PUMP	P6	Initial pump speed = 1336.804 [rpm]

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	0.0000	s	PUMP	P7	Initial pump speed = 1336.733 [rpm]
At	0.0000	s	CHECKV	C1	Starts in open phase
At	0.0000	s	CHECKV	C2	Starts in open phase
At	0.0000	s	CHECKV	C3	Starts in open phase
At	0.0000	s	CHECKV	C4	Starts in closed phase
At	0.0000	s	CHECKV	C5	Starts in open phase
At	0.0000	s	CHECKV	C6	Starts in open phase
At	0.0000	s	CHECKV	C7	Starts in open phase
At	0.0000	s	CHECKV	C8	Starts in closed phase
At	0.30000E-01	s	PUMP	P1	tripping
At	0.30000E-01	s	PUMP	P2	tripping
At	0.30000E-01	s	PUMP	P3	tripping
At	0.30000E-01	s	PUMP	P4	tripping
At	0.30000E-01	s	PUMP	P5	tripping
At	0.30000E-01	s	PUMP	P6	tripping
At	0.30000E-01	s	PUMP	P7	tripping
At	0.30000E-01	s	PUMP	P8	tripping
At	1.5000	s	CHECKV	C4	Opens
At	1.5000	s	CHECKV	C8	Opens
At	2.1300	s	CHECKV	C4	Closes
At	2.5500	s	CHECKV	C8	Closes
At	4.9200	s	H-node	BE	Cavitates
At	5.0400	s	CHECKV	C8	Opens
At	5.2200	s	CHECKV	C4	Opens
At	5.5500	s	H-node	BD	Cavitates
At	9.1200	s	CHECKV	C4	Closes
At	9.6300	s	CHECKV	C8	Closes
At	10.530	s	CHECKV	C1	Closes
At	10.530	s	CHECKV	C3	Closes
At	10.560	s	CHECKV	C2	Closes
At	10.800	s	CHECKV	C5	Closes
At	10.800	s	CHECKV	C7	Closes
At	10.830	s	CHECKV	C6	Closes
At	12.930	s	H-node	BE	Cavitation collapses
At	13.860	s	H-node	BD	Cavitation collapses
At	13.860	s	H-node	BE	Cavitates
At	13.950	s	H-node	BE	Cavitation collapses
At	13.980	s	H-node	BE	Cavitates
At	14.010	s	H-node	BE	Cavitation collapses
At	14.100	s	H-node	BE	Cavitates
At	14.280	s	H-node	BE	Cavitation collapses
At	26.400	s	H-node	BD	Cavitates
At	26.430	s	H-node	BD	Cavitation collapses
At	26.520	s	H-node	BE	Cavitates
At	26.550	s	H-node	BD	Cavitates
At	27.210	s	H-node	BD	Cavitation collapses
At	28.860	s	CHECKV	C5	Opens
At	28.860	s	CHECKV	C6	Opens
At	28.860	s	CHECKV	C7	Opens
At	28.860	s	CHECKV	C8	Opens
At	28.890	s	CHECKV	C5	Closes
At	28.890	s	CHECKV	C6	Closes

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	28.890	s	CHECKV	C7	Closes
At	28.890	s	CHECKV	C8	Closes
At	28.950	s	CHECKV	C1	Opens
At	28.950	s	CHECKV	C2	Opens
At	28.950	s	CHECKV	C3	Opens
At	28.950	s	CHECKV	C4	Opens
At	28.980	s	CHECKV	C1	Closes
At	28.980	s	CHECKV	C2	Closes
At	28.980	s	CHECKV	C3	Closes
At	28.980	s	CHECKV	C4	Closes
At	29.280	s	CHECKV	C1	Opens
At	29.280	s	CHECKV	C2	Opens
At	29.280	s	CHECKV	C3	Opens
At	29.280	s	CHECKV	C4	Opens
At	29.310	s	CHECKV	C5	Opens
At	29.310	s	CHECKV	C6	Opens
At	29.310	s	CHECKV	C7	Opens
At	29.310	s	CHECKV	C8	Opens
At	29.340	s	CHECKV	C5	Closes
At	29.340	s	CHECKV	C6	Closes
At	29.340	s	CHECKV	C7	Closes
At	29.340	s	CHECKV	C8	Closes
At	29.370	s	CHECKV	C1	Closes
At	29.370	s	CHECKV	C2	Closes
At	29.370	s	CHECKV	C3	Closes
At	29.370	s	CHECKV	C4	Closes
At	29.370	s	CHECKV	C5	Opens
At	29.370	s	CHECKV	C6	Opens
At	29.370	s	CHECKV	C7	Opens
At	29.370	s	CHECKV	C8	Opens
At	29.400	s	CHECKV	C5	Closes
At	29.400	s	CHECKV	C6	Closes
At	29.400	s	CHECKV	C7	Closes
At	29.400	s	CHECKV	C8	Closes
At	29.400	s	H-node	BE	Cavitation collapses
At	29.460	s	CHECKV	C1	Opens
At	29.460	s	CHECKV	C2	Opens
At	29.460	s	CHECKV	C3	Opens
At	29.460	s	CHECKV	C4	Opens
At	29.490	s	CHECKV	C1	Closes
At	29.490	s	CHECKV	C2	Closes
At	29.490	s	CHECKV	C3	Closes
At	29.490	s	CHECKV	C4	Closes
At	29.490	s	CHECKV	C5	Opens
At	29.490	s	CHECKV	C6	Opens
At	29.490	s	CHECKV	C7	Opens
At	29.490	s	CHECKV	C8	Opens
At	29.520	s	CHECKV	C1	Opens
At	29.520	s	CHECKV	C2	Opens
At	29.520	s	CHECKV	C3	Opens
At	29.520	s	CHECKV	C4	Opens
At	29.550	s	CHECKV	C1	Closes

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	29.550	s	CHECKV	C2	Closes
At	29.550	s	CHECKV	C3	Closes
At	29.550	s	CHECKV	C4	Closes
At	29.580	s	CHECKV	C1	Opens
At	29.580	s	CHECKV	C2	Opens
At	29.580	s	CHECKV	C3	Opens
At	29.580	s	CHECKV	C4	Opens
At	29.610	s	CHECKV	C1	Closes
At	29.610	s	CHECKV	C2	Closes
At	29.610	s	CHECKV	C3	Closes
At	29.610	s	CHECKV	C4	Closes
At	29.640	s	CHECKV	C5	Closes
At	29.640	s	CHECKV	C6	Closes
At	29.640	s	CHECKV	C7	Closes
At	29.640	s	CHECKV	C8	Closes
At	29.730	s	CHECKV	C1	Opens
At	29.730	s	CHECKV	C2	Opens
At	29.730	s	CHECKV	C3	Opens
At	29.730	s	CHECKV	C4	Opens
At	29.790	s	CHECKV	C5	Opens
At	29.790	s	CHECKV	C6	Opens
At	29.790	s	CHECKV	C7	Opens
At	29.790	s	CHECKV	C8	Opens
At	30.630	s	CHECKV	C4	Closes
At	30.660	s	CHECKV	C4	Opens
At	30.900	s	CHECKV	C4	Closes
At	30.930	s	CHECKV	C1	Closes
At	30.930	s	CHECKV	C2	Closes
At	30.930	s	CHECKV	C3	Closes
At	31.020	s	CHECKV	C8	Closes
At	31.020	s	CHECKV	C5	Closes
At	31.050	s	CHECKV	C6	Closes
At	31.050	s	CHECKV	C7	Closes
At	31.230	s	CHECKV	C5	Opens
At	31.230	s	CHECKV	C6	Opens
At	31.230	s	CHECKV	C7	Opens
At	31.230	s	CHECKV	C8	Opens
At	31.260	s	CHECKV	C1	Opens
At	31.260	s	CHECKV	C2	Opens
At	31.260	s	CHECKV	C3	Opens
At	31.260	s	CHECKV	C4	Opens
At	31.260	s	CHECKV	C5	Closes
At	31.260	s	CHECKV	C6	Closes
At	31.260	s	CHECKV	C7	Closes
At	31.260	s	CHECKV	C8	Closes
At	31.290	s	CHECKV	C1	Closes
At	31.290	s	CHECKV	C2	Closes
At	31.290	s	CHECKV	C3	Closes
At	31.290	s	CHECKV	C4	Closes
At	31.710	s	CHECKV	C1	Opens
At	31.710	s	CHECKV	C2	Opens
At	31.710	s	CHECKV	C3	Opens

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	31.710	s	CHECKV	C4	Opens
At	31.710	s	CHECKV	C5	Opens
At	31.710	s	CHECKV	C6	Opens
At	31.710	s	CHECKV	C7	Opens
At	31.710	s	CHECKV	C8	Opens
At	32.670	s	H-node	BD	Cavitates
At	32.700	s	H-node	BD	Cavitation collapses
At	32.730	s	H-node	BE	Cavitates
At	32.850	s	H-node	BD	Cavitates
At	33.330	s	H-node	BD	Cavitation collapses
At	33.390	s	H-node	BD	Cavitates
At	33.480	s	CHECKV	C1	Closes
At	33.480	s	CHECKV	C2	Closes
At	33.480	s	CHECKV	C3	Closes
At	33.480	s	CHECKV	C4	Closes
At	33.510	s	CHECKV	C5	Closes
At	33.510	s	CHECKV	C6	Closes
At	33.510	s	CHECKV	C7	Closes
At	33.510	s	CHECKV	C8	Closes
At	33.570	s	CHECKV	C5	Opens
At	33.570	s	CHECKV	C6	Opens
At	33.570	s	CHECKV	C7	Opens
At	33.570	s	CHECKV	C8	Opens
At	33.600	s	CHECKV	C1	Opens
At	33.600	s	CHECKV	C2	Opens
At	33.600	s	CHECKV	C3	Opens
At	33.600	s	CHECKV	C4	Opens
At	33.780	s	CHECKV	C1	Closes
At	33.780	s	CHECKV	C2	Closes
At	33.780	s	CHECKV	C3	Closes
At	33.780	s	CHECKV	C4	Closes
At	33.810	s	CHECKV	C5	Closes
At	33.810	s	CHECKV	C6	Closes
At	33.810	s	CHECKV	C7	Closes
At	33.810	s	CHECKV	C8	Closes
At	33.810	s	H-node	BD	Cavitation collapses
At	33.990	s	CHECKV	C1	Opens
At	33.990	s	CHECKV	C2	Opens
At	33.990	s	CHECKV	C3	Opens
At	33.990	s	CHECKV	C4	Opens
At	33.990	s	CHECKV	C5	Opens
At	33.990	s	CHECKV	C6	Opens
At	33.990	s	CHECKV	C7	Opens
At	33.990	s	CHECKV	C8	Opens
At	34.020	s	CHECKV	C1	Closes
At	34.020	s	CHECKV	C2	Closes
At	34.020	s	CHECKV	C3	Closes
At	34.020	s	CHECKV	C4	Closes
At	34.020	s	CHECKV	C5	Closes
At	34.020	s	CHECKV	C6	Closes
At	34.020	s	CHECKV	C7	Closes
At	34.020	s	CHECKV	C8	Closes

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	34.080	s	CHECKV	C1	Opens
At	34.080	s	CHECKV	C2	Opens
At	34.080	s	CHECKV	C3	Opens
At	34.080	s	CHECKV	C4	Opens
At	34.110	s	CHECKV	C1	Closes
At	34.110	s	CHECKV	C2	Closes
At	34.110	s	CHECKV	C3	Closes
At	34.110	s	CHECKV	C4	Closes
At	34.170	s	CHECKV	C1	Opens
At	34.170	s	CHECKV	C2	Opens
At	34.170	s	CHECKV	C3	Opens
At	34.170	s	CHECKV	C4	Opens
At	34.200	s	CHECKV	C1	Closes
At	34.200	s	CHECKV	C2	Closes
At	34.200	s	CHECKV	C3	Closes
At	34.200	s	CHECKV	C4	Closes
At	34.260	s	CHECKV	C5	Opens
At	34.260	s	CHECKV	C6	Opens
At	34.260	s	CHECKV	C7	Opens
At	34.260	s	CHECKV	C8	Opens
At	34.290	s	CHECKV	C5	Closes
At	34.290	s	CHECKV	C6	Closes
At	34.290	s	CHECKV	C7	Closes
At	34.290	s	CHECKV	C8	Closes
At	34.650	s	H-node	BD	Cavitates
At	34.680	s	H-node	BD	Cavitation collapses
At	34.860	s	H-node	BD	Cavitates
At	34.890	s	H-node	BD	Cavitation collapses
At	36.420	s	H-node	BD	Cavitates
At	36.450	s	H-node	BD	Cavitation collapses
At	36.480	s	H-node	D	Cavitates
At	36.480	s	H-node	AH	Cavitates
At	36.510	s	H-node	D	Cavitation collapses
At	36.510	s	H-node	AH	Cavitation collapses
At	36.540	s	H-node	AH	Cavitates
At	36.570	s	H-node	C	Cavitates
At	36.600	s	H-node	AH	Cavitation collapses
At	36.630	s	H-node	C	Cavitation collapses
At	36.660	s	H-node	B	Cavitates
At	36.690	s	H-node	B	Cavitation collapses
At	36.690	s	H-node	C	Cavitates
At	36.840	s	H-node	C	Cavitation collapses
At	36.900	s	H-node	AH	Cavitates
At	36.960	s	H-node	AH	Cavitation collapses
At	38.160	s	H-node	BE	Cavitation collapses
At	40.230	s	H-node	AH	Cavitates
At	40.290	s	H-node	AH	Cavitation collapses
At	40.320	s	H-node	C	Cavitates
At	40.350	s	H-node	D	Cavitates
At	40.380	s	H-node	D	Cavitation collapses
At	40.410	s	H-node	AH	Cavitates
At	40.500	s	H-node	D	Cavitates

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	40.530	s	H-node	D	Cavitation collapses
At	40.530	s	H-node	AH	Cavitation collapses
At	40.590	s	H-node	C	Cavitation collapses
At	40.620	s	H-node	C	Cavitates
At	40.740	s	H-node	C	Cavitation collapses
At	40.830	s	H-node	C	Cavitates
At	40.890	s	H-node	C	Cavitation collapses
At	40.920	s	H-node	D	Cavitates
At	40.980	s	H-node	D	Cavitation collapses
At	44.250	s	H-node	AH	Cavitates
At	44.280	s	H-node	AH	Cavitation collapses
At	44.310	s	H-node	D	Cavitates
At	44.370	s	H-node	C	Cavitates
At	44.400	s	H-node	C	Cavitation collapses
At	44.400	s	H-node	D	Cavitation collapses
At	44.400	s	H-node	AH	Cavitates
At	44.430	s	H-node	AH	Cavitation collapses
At	44.460	s	H-node	D	Cavitates
At	44.460	s	H-node	AH	Cavitates
At	44.490	s	H-node	C	Cavitates
At	44.490	s	H-node	D	Cavitation collapses
At	44.490	s	H-node	AH	Cavitation collapses
At	44.520	s	H-node	C	Cavitation collapses
At	44.550	s	H-node	C	Cavitates
At	44.610	s	H-node	C	Cavitation collapses
At	44.640	s	H-node	AH	Cavitates
At	44.670	s	H-node	AH	Cavitation collapses
At	44.760	s	H-node	B	Cavitates
At	44.790	s	H-node	B	Cavitation collapses
At	48.450	s	H-node	B	Cavitates
At	48.480	s	H-node	B	Cavitation collapses
At	48.660	s	H-node	B	Cavitates
At	48.720	s	H-node	B	Cavitation collapses
At	48.750	s	H-node	C	Cavitates
At	48.810	s	H-node	C	Cavitation collapses
At	48.900	s	H-node	AH	Cavitates
At	49.020	s	H-node	AH	Cavitation collapses
At	49.470	s	H-node	BE	Cavitates
At	49.500	s	H-node	BE	Cavitation collapses
At	49.950	s	H-node	BE	Cavitates
At	50.310	s	H-node	BD	Cavitates
At	50.340	s	H-node	BE	Cavitation collapses
At	50.520	s	H-node	BD	Cavitation collapses
At	50.580	s	H-node	BD	Cavitates
At	50.640	s	H-node	BE	Cavitates
At	50.790	s	H-node	BE	Cavitation collapses
At	50.820	s	H-node	BD	Cavitation collapses
At	50.880	s	H-node	BE	Cavitates
At	50.910	s	H-node	BE	Cavitation collapses
At	50.940	s	H-node	BE	Cavitates
At	50.970	s	H-node	BE	Cavitation collapses
At	51.000	s	H-node	BE	Cavitates

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	51.030	s	H-node	BE	Cavitation collapses
At	51.060	s	H-node	BE	Cavitates
At	51.090	s	H-node	BE	Cavitation collapses
At	51.120	s	H-node	BE	Cavitates
At	51.480	s	H-node	BE	Cavitation collapses
At	52.350	s	H-node	D	Cavitates
At	52.380	s	H-node	D	Cavitation collapses
At	52.440	s	H-node	AH	Cavitates
At	52.500	s	H-node	AH	Cavitation collapses
At	52.560	s	H-node	D	Cavitates
At	52.590	s	H-node	C	Cavitates
At	52.650	s	H-node	D	Cavitation collapses
At	52.650	s	H-node	AH	Cavitates
At	52.740	s	H-node	D	Cavitates
At	52.740	s	H-node	BE	Cavitates
At	52.770	s	H-node	BE	Cavitation collapses
At	52.800	s	H-node	D	Cavitation collapses
At	52.800	s	H-node	AH	Cavitation collapses
At	52.800	s	H-node	BE	Cavitates
At	52.860	s	H-node	D	Cavitates
At	52.920	s	H-node	C	Cavitation collapses
At	52.920	s	H-node	D	Cavitation collapses
At	53.430	s	H-node	BD	Cavitates
At	53.490	s	H-node	BD	Cavitation collapses
At	53.550	s	CHECKV	C5	Opens
At	53.550	s	CHECKV	C6	Opens
At	53.550	s	CHECKV	C7	Opens
At	53.550	s	CHECKV	C8	Opens
At	53.580	s	CHECKV	C5	Closes
At	53.580	s	CHECKV	C6	Closes
At	53.580	s	CHECKV	C7	Closes
At	53.580	s	CHECKV	C8	Closes
At	53.730	s	CHECKV	C5	Opens
At	53.730	s	CHECKV	C6	Opens
At	53.730	s	CHECKV	C7	Opens
At	53.730	s	CHECKV	C8	Opens
At	53.790	s	CHECKV	C5	Closes
At	53.790	s	CHECKV	C6	Closes
At	53.790	s	CHECKV	C7	Closes
At	53.790	s	CHECKV	C8	Closes
At	53.910	s	CHECKV	C5	Opens
At	53.910	s	CHECKV	C6	Opens
At	53.910	s	CHECKV	C7	Opens
At	53.910	s	CHECKV	C8	Opens
At	53.970	s	CHECKV	C1	Opens
At	53.970	s	CHECKV	C2	Opens
At	53.970	s	CHECKV	C3	Opens
At	53.970	s	CHECKV	C4	Opens
At	54.510	s	CHECKV	C1	Closes
At	54.510	s	CHECKV	C4	Closes
At	54.510	s	CHECKV	C2	Closes
At	54.510	s	CHECKV	C3	Closes

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

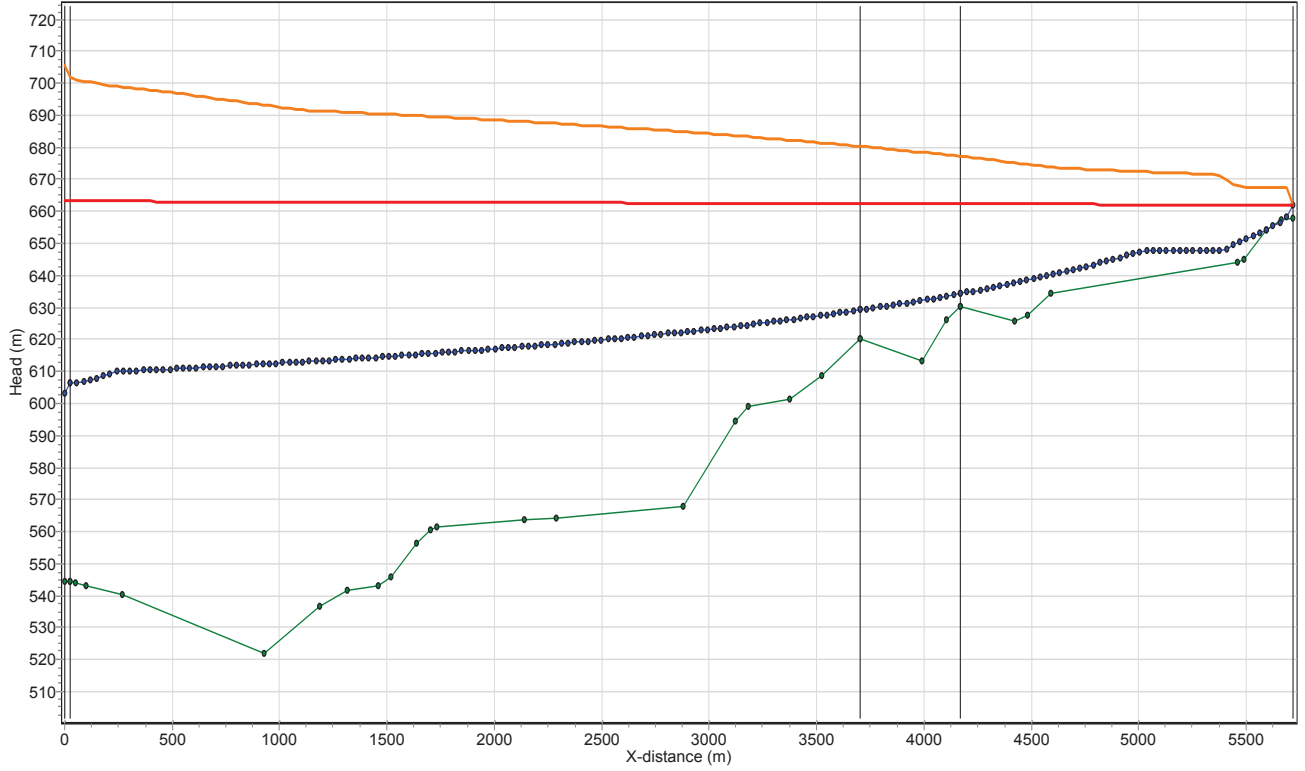
At	54.540	s	CHECKV	C1	Opens
At	54.540	s	CHECKV	C2	Opens
At	54.540	s	CHECKV	C3	Opens
At	54.540	s	CHECKV	C4	Opens
At	54.720	s	CHECKV	C4	Closes
At	54.720	s	CHECKV	C1	Closes
At	54.750	s	CHECKV	C2	Closes
At	54.750	s	CHECKV	C3	Closes
At	54.810	s	CHECKV	C1	Opens
At	54.810	s	CHECKV	C2	Opens
At	54.810	s	CHECKV	C3	Opens
At	54.810	s	CHECKV	C4	Opens
At	54.810	s	H-node	BE	Cavitation collapses
At	54.840	s	CHECKV	C1	Closes
At	54.840	s	CHECKV	C2	Closes
At	54.840	s	CHECKV	C3	Closes
At	54.840	s	CHECKV	C4	Closes
At	54.870	s	CHECKV	C5	Closes
At	54.870	s	CHECKV	C6	Closes
At	54.870	s	CHECKV	C7	Closes
At	54.870	s	CHECKV	C8	Closes
At	55.380	s	CHECKV	C1	Opens
At	55.380	s	CHECKV	C2	Opens
At	55.380	s	CHECKV	C3	Opens
At	55.380	s	CHECKV	C4	Opens
At	55.440	s	CHECKV	C1	Closes
At	55.440	s	CHECKV	C2	Closes
At	55.440	s	CHECKV	C3	Closes
At	55.440	s	CHECKV	C4	Closes
At	55.440	s	CHECKV	C5	Opens
At	55.440	s	CHECKV	C6	Opens
At	55.440	s	CHECKV	C7	Opens
At	55.440	s	CHECKV	C8	Opens
At	55.470	s	CHECKV	C1	Opens
At	55.470	s	CHECKV	C2	Opens
At	55.470	s	CHECKV	C3	Opens
At	55.470	s	CHECKV	C4	Opens
At	55.530	s	CHECKV	C1	Closes
At	55.530	s	CHECKV	C2	Closes
At	55.530	s	CHECKV	C3	Closes
At	55.530	s	CHECKV	C4	Closes
At	55.560	s	CHECKV	C5	Closes
At	55.560	s	CHECKV	C6	Closes
At	55.560	s	CHECKV	C7	Closes
At	55.560	s	CHECKV	C8	Closes
At	56.610	s	H-node	AH	Cavitates
At	56.670	s	H-node	AH	Cavitation collapses
At	57.630	s	H-node	BE	Cavitates
At	57.660	s	H-node	BE	Cavitation collapses
At	58.050	s	H-node	BE	Cavitates
At	58.230	s	H-node	BE	Cavitation collapses
At	58.320	s	CHECKV	C1	Opens

3.1.2 OUTPUT - K.MARAS 1.KD+2.KD -ÖNLEMSİZ -03 JUL 17.wor

At	58.320	s	CHECKV	C2	Opens
At	58.320	s	CHECKV	C3	Opens
At	58.320	s	CHECKV	C4	Opens
At	58.350	s	CHECKV	C1	Closes
At	58.350	s	CHECKV	C2	Closes
At	58.350	s	CHECKV	C3	Closes
At	58.350	s	CHECKV	C4	Closes
At	58.410	s	CHECKV	C5	Opens
At	58.410	s	CHECKV	C6	Opens
At	58.410	s	CHECKV	C7	Opens
At	58.410	s	CHECKV	C8	Opens
At	58.470	s	CHECKV	C5	Closes
At	58.470	s	CHECKV	C6	Closes
At	58.470	s	CHECKV	C7	Closes
At	58.470	s	CHECKV	C8	Closes
At	58.500	s	CHECKV	C1	Opens
At	58.500	s	CHECKV	C2	Opens
At	58.500	s	CHECKV	C3	Opens
At	58.500	s	CHECKV	C4	Opens
At	58.530	s	CHECKV	C1	Closes
At	58.530	s	CHECKV	C2	Closes
At	58.530	s	CHECKV	C3	Closes
At	58.530	s	CHECKV	C4	Closes

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17
PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



Labels

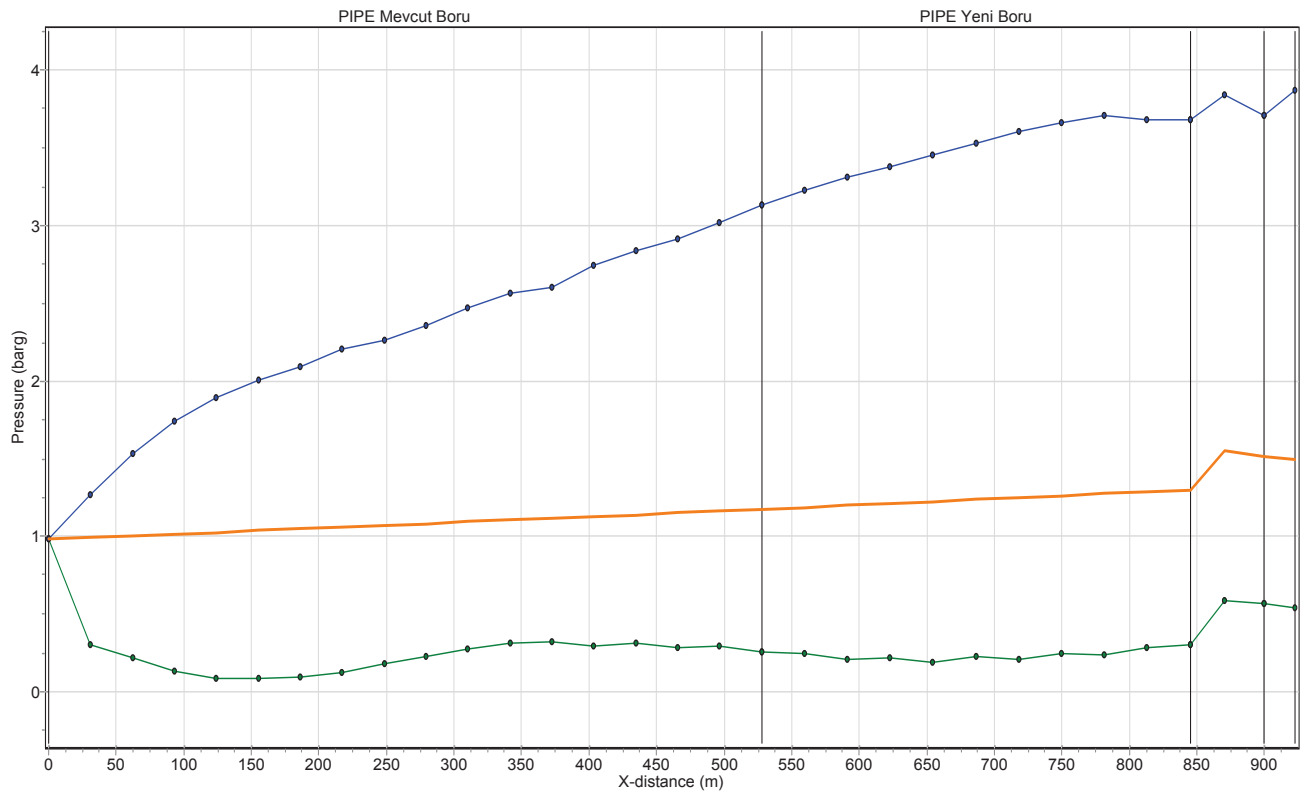
Profile (MARAS IS)

Head min (MARAS IS)

Head max (MARAS IS)

Head 0.00s (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17



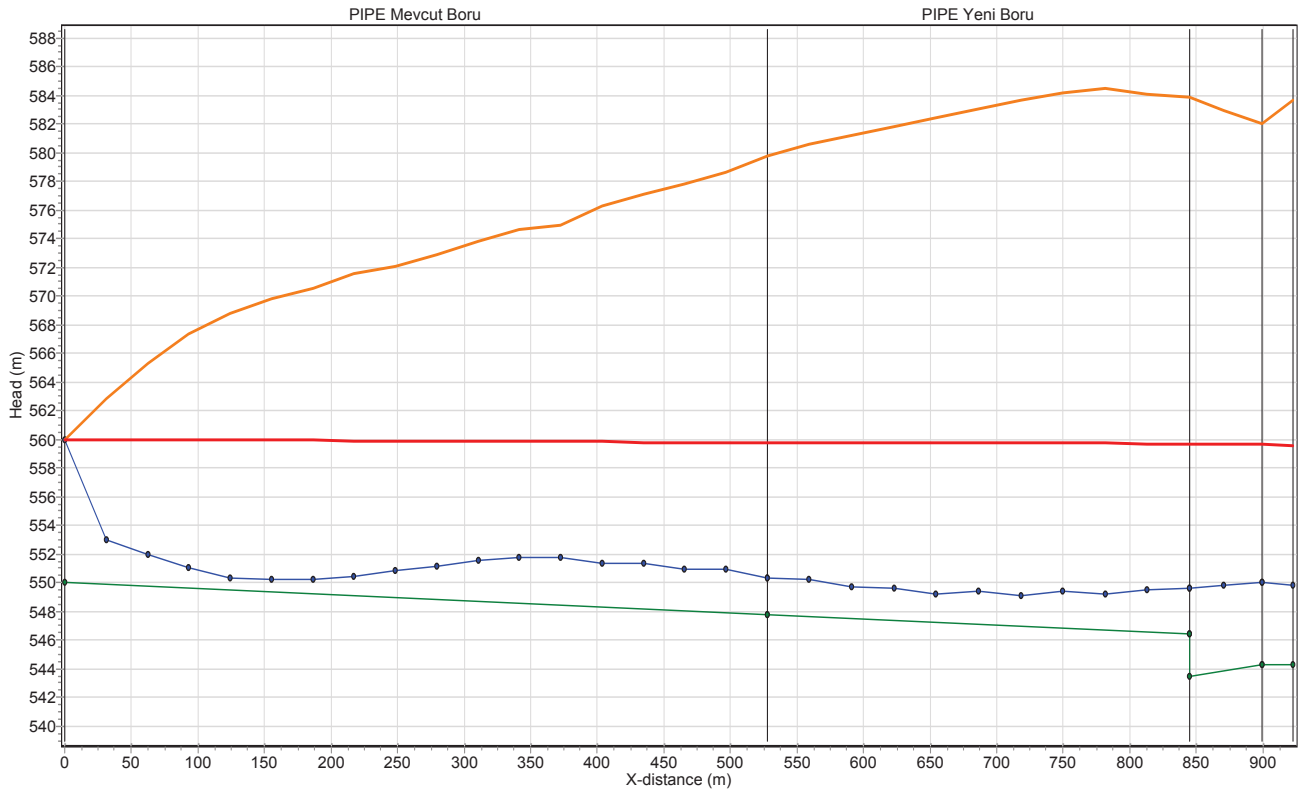
Labels

Pressure min (MARAS IS)

Pressure max (MARAS IS)

Pressure 0.00s (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17



Labels

Profile (MARAS IS)

Head min (MARAS IS)

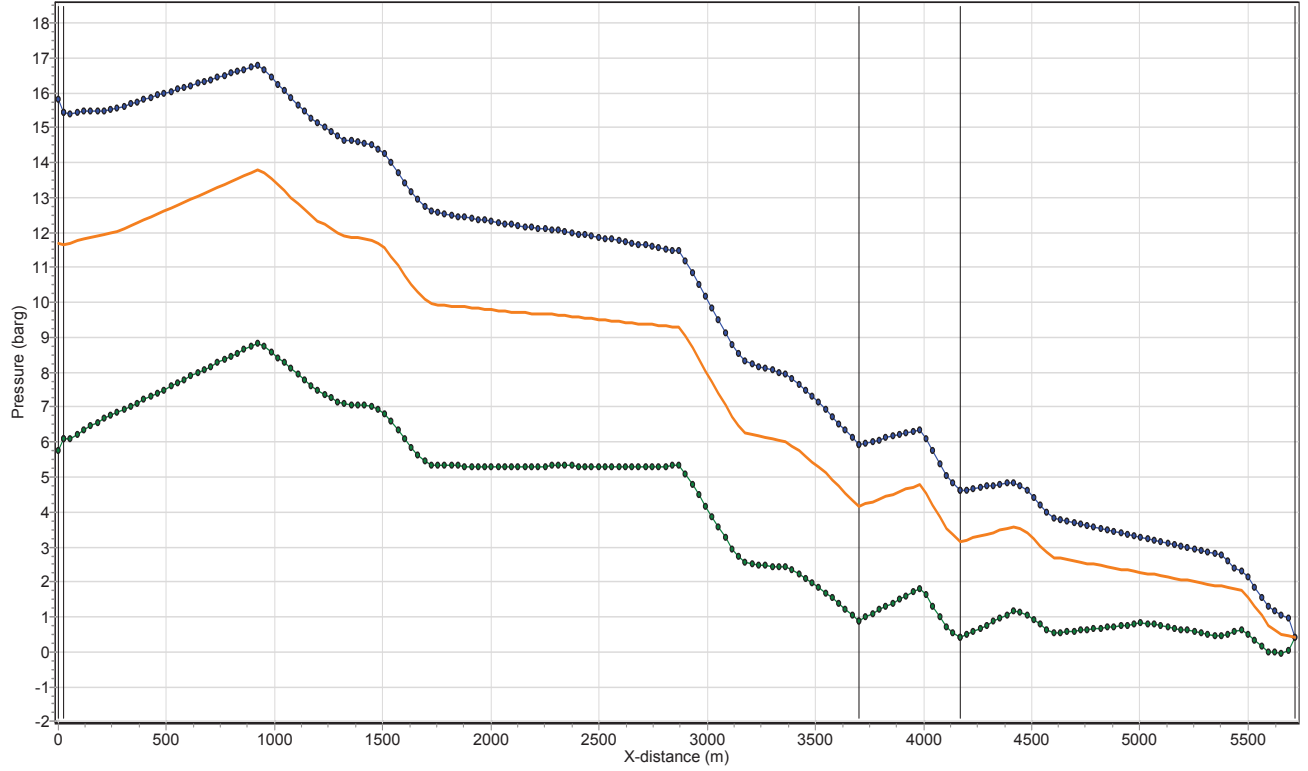
Head max (MARAS IS)

Head 0.00s (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



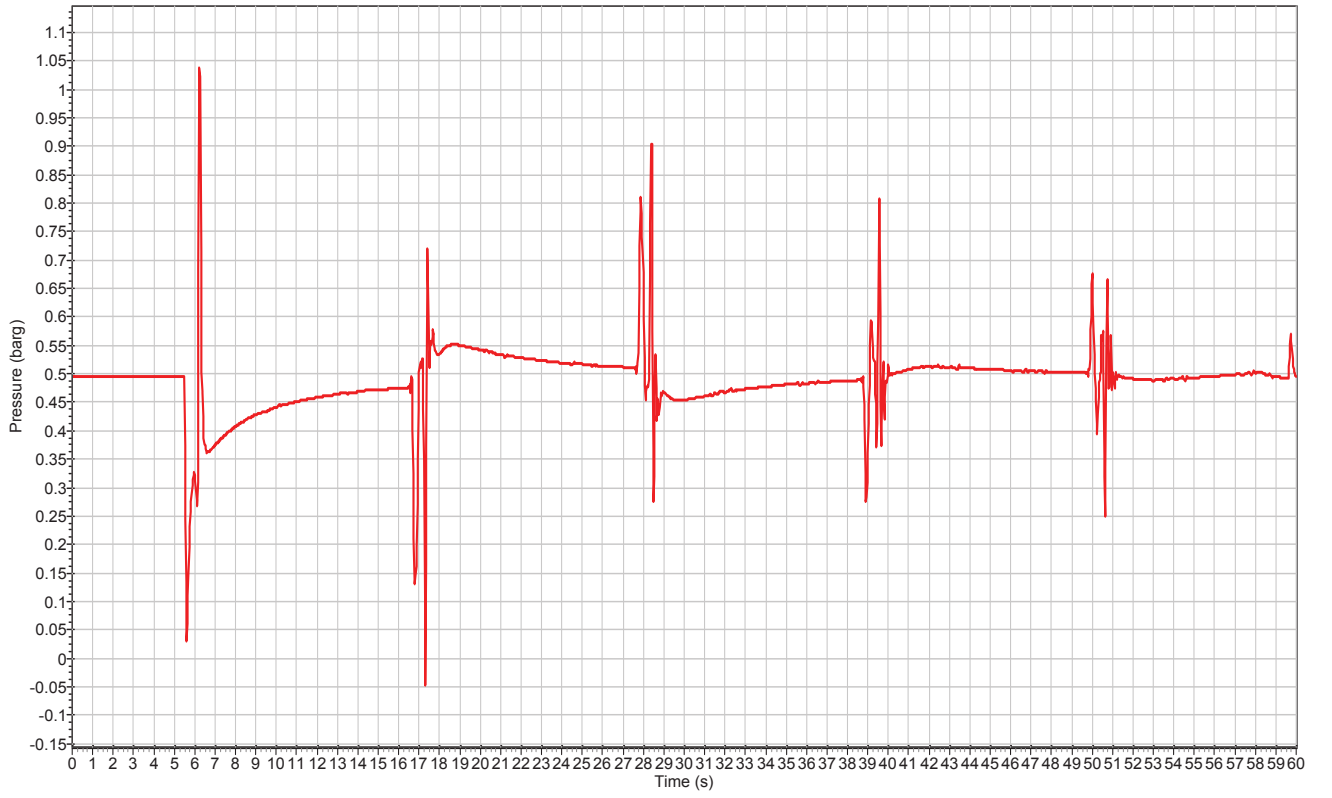
Labels

Pressure min (MARAS IS)

Pressure max (MARAS IS)

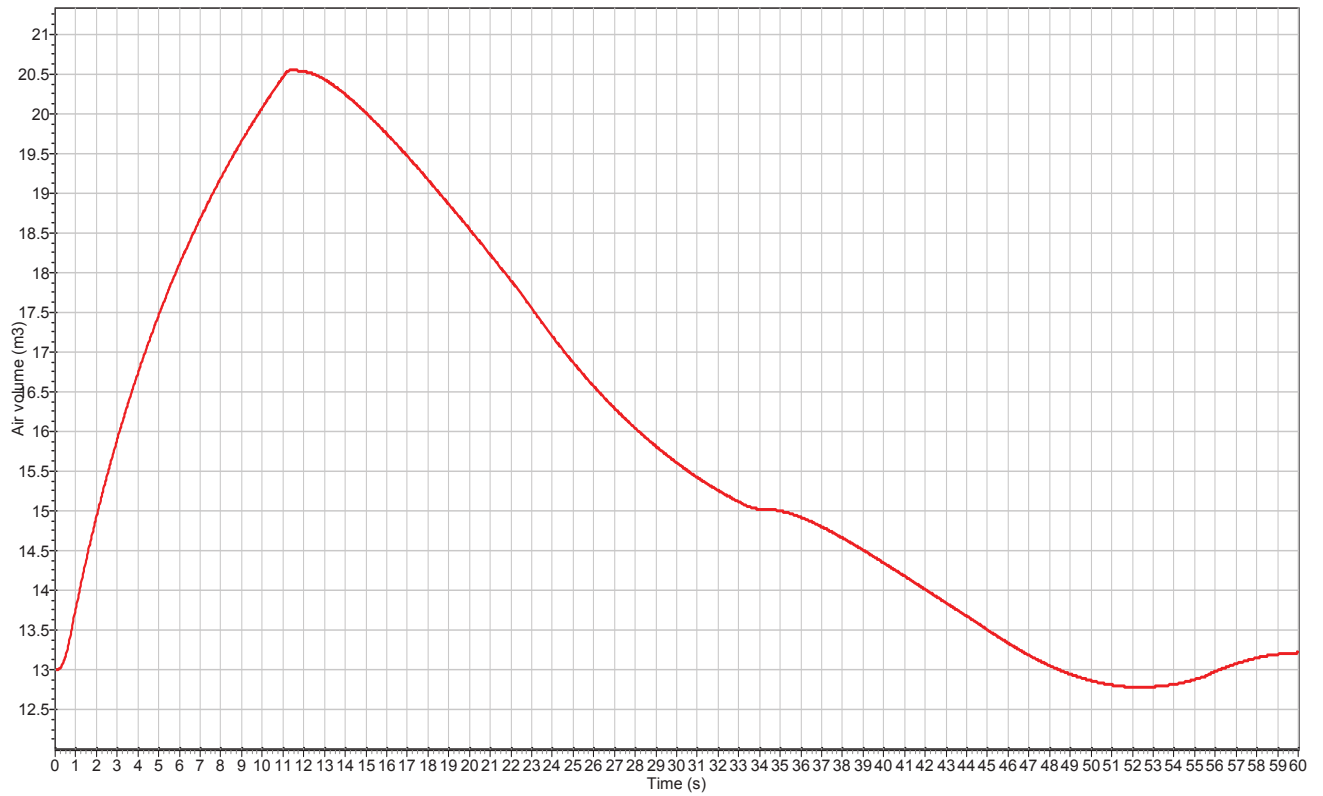
Pressure 0.00s (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17



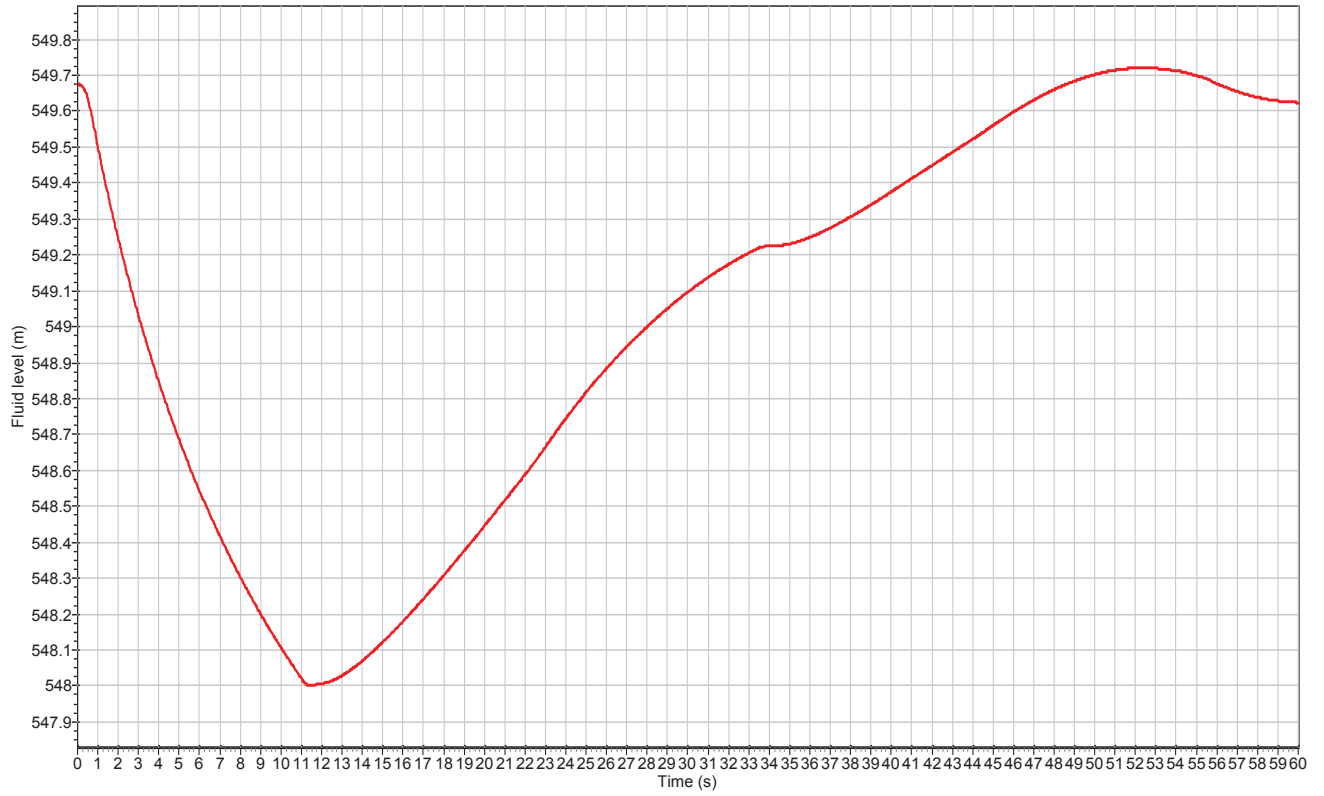
— Pressure PIPE BASMA BORUSU-3 5654 m (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17



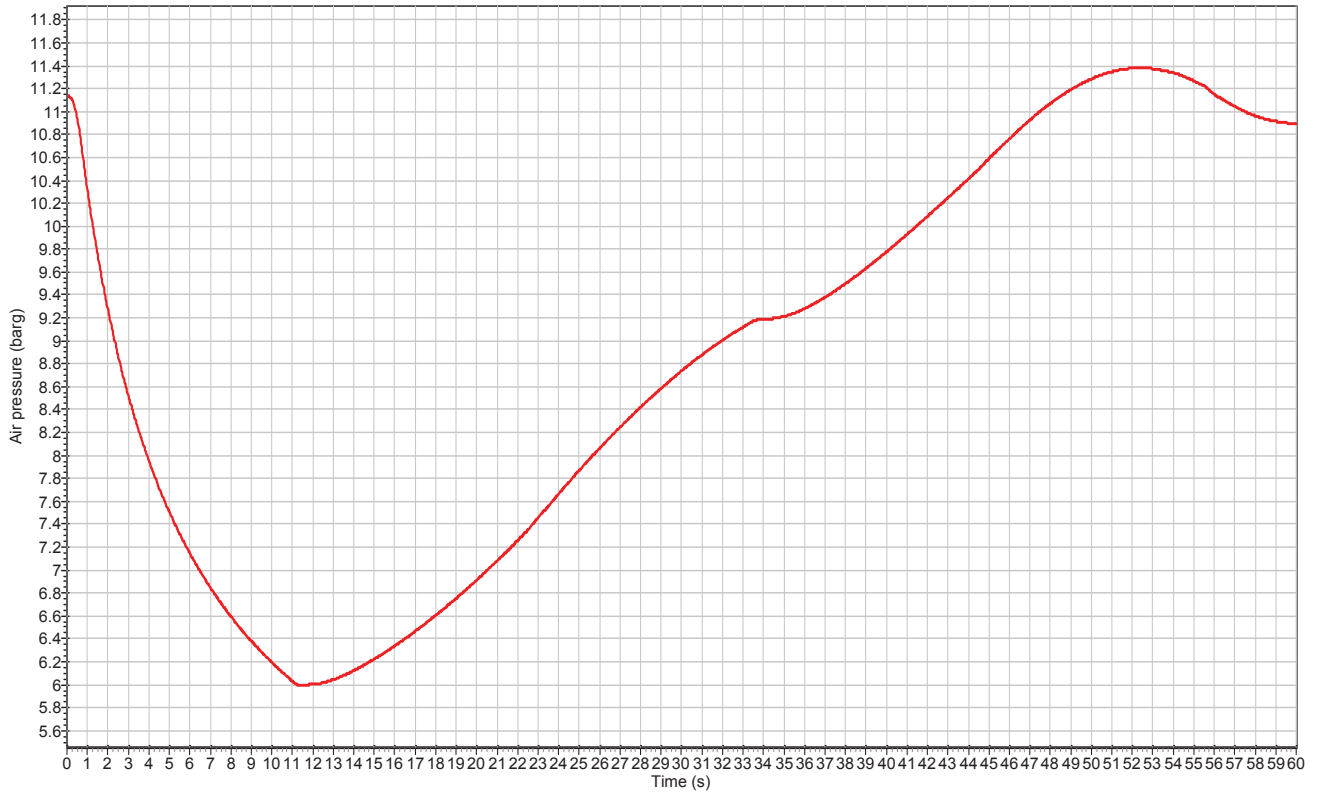
— Air volume AIRV/vn A1 (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17



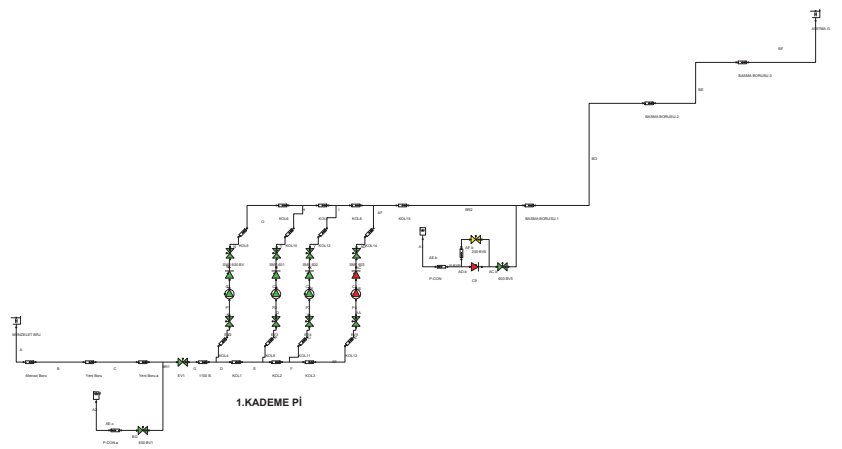
— Fluid level AIRVvn A1 (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

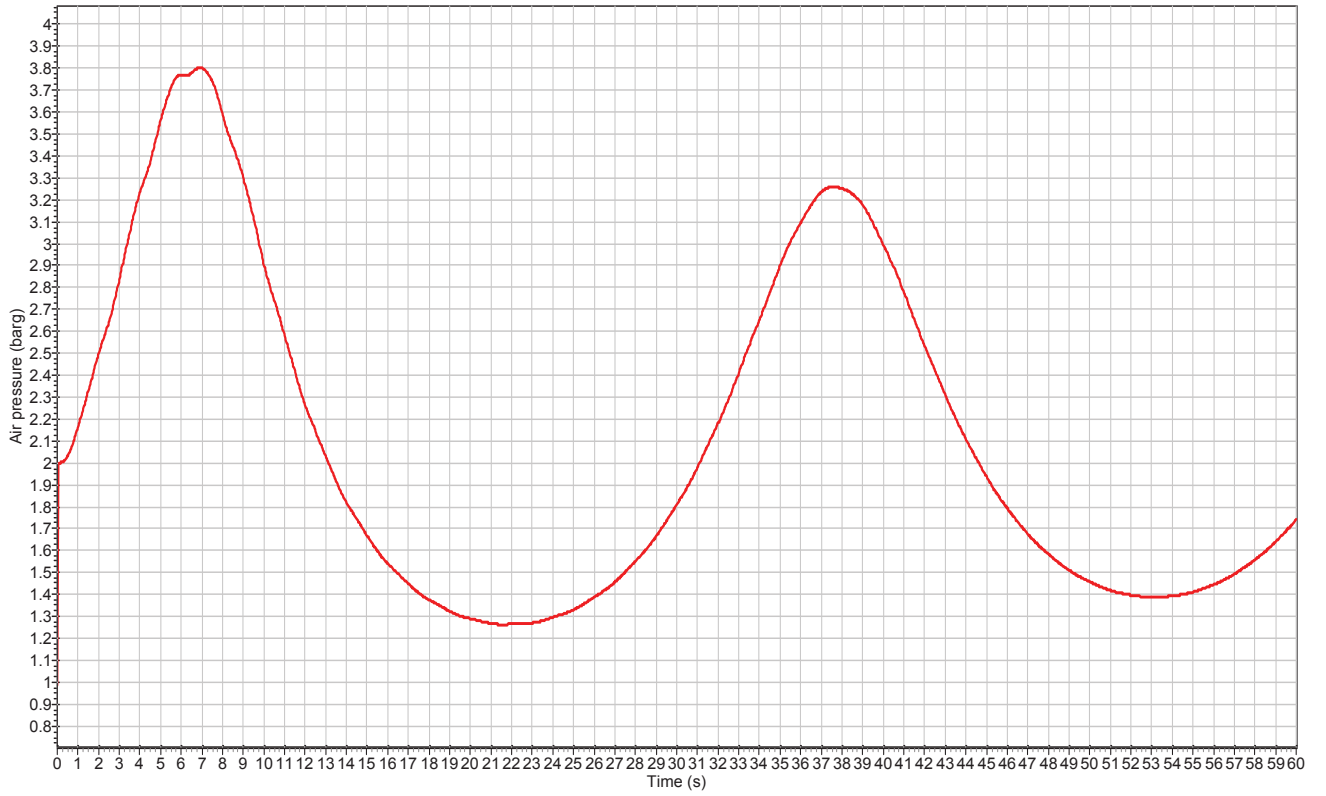


— Air pressure AIRVvn A1 (MARAS IS)

3.1.3 KADME PI (40. KADME) (0. 20. 17.40)

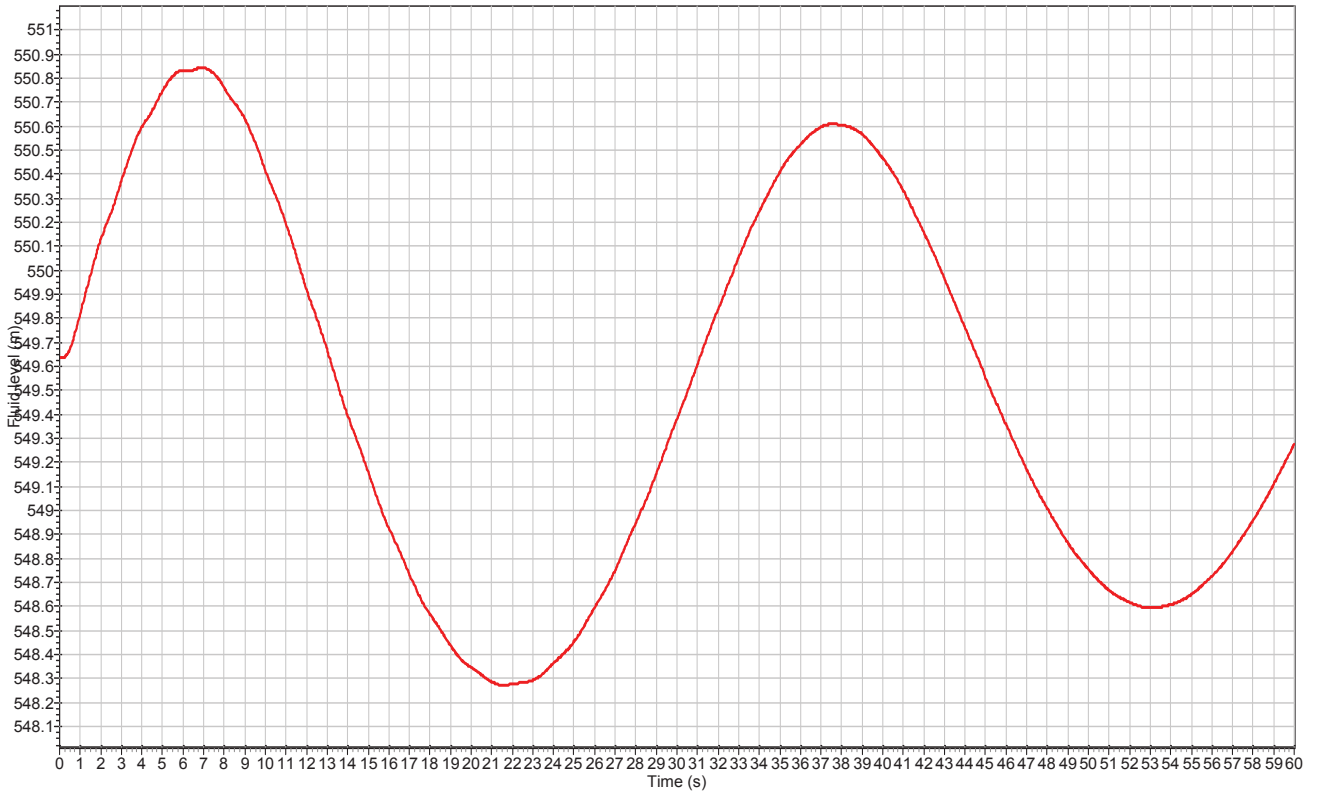


3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17



— Air pressure AIRVva A2 (MARAS IS)

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17



— Fluid level AIRVva A2 (MARAS IS)

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 01:16:45

Case : 3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

Title: 3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

Case description:

=====

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

H-scheme connectivity:

=====

lhs H-node	H-component	rhs H-node
AE.c	AIRVva A2	
AE.b	AIRVvn A1	
BF	BOUNDH ARITMA G.	
A	BOUNDH MENZELET BRJ	
L	CHECKV C1	M
R	CHECKV C2	S
W	CHECKV C3	X
AB	CHECKV C4	AC
AD.b	CHECKV C9	AC.b
G	PIPE 1100 B.	D
BR2	PIPE BASMA BORUSU-1	BD
BD	PIPE BASMA BORUSU-2	BE
BE	PIPE BASMA BORUSU-3	BF
AF	PIPE KOL15	BR2
A	PIPE Mevcut Boru	B
B	PIPE Yeni Boru	C
C	PIPE Yeni Boru.a	BR1
D	PRIGID KOL1	E
T	PRIGID KOL10	H
F	PRIGID KOL11	U
Y	PRIGID KOL12	I
AE	PRIGID KOL13	Z
AD	PRIGID KOL14	AF
E	PRIGID KOL2	F
F	PRIGID KOL3	AE
D	PRIGID KOL4	J
N	PRIGID KOL5	O
O	PRIGID KOL6	H
H	PRIGID KOL7	I
I	PRIGID KOL8	AF

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

E	PRIGID	KOL9	P
AF.b	PRIGID	P-BYP	AD.b
AD.b	PRIGID	P-CON	AE.b
BG	PRIGID	P-CON.a	AE.c
K	PUMP	P1	L
Q	PUMP	P2	R
V	PUMP	P3	W
AA	PUMP	P4	AB
AF.b	VALVE	200 BV6	AC.b
BG	VALVE	600 BV1	BR1
AC.b	VALVE	600 BV5	BR2
BR1	VALVE	EV1	G
J	VALVE	EV2	K
P	VALVE	EV3	Q
U	VALVE	EV4	V
Z	VALVE	EV5	AA
M	VALVE	SMS 600 BV	N
S	VALVE	SMS 601	T
X	VALVE	SMS 602	Y
AC	VALVE	SMS 603	AD

H-node heights:

=====

H-node	height [m]
A	550.000
AA	544.250
AB	544.250
AC	544.250
AC.b	544.250
AD	544.250
AD.b	544.250
AE	544.250
AE.b	546.550
AE.c	546.550
AF	544.250
AF.b	544.250
B	547.800
BD	620.010
BE	630.180
BF	657.850
BG	544.250
BR1	544.250
BR2	544.250
C	546.450
D	544.250
E	544.250
F	544.250
G	544.250
H	544.250

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

I	544.250
J	544.250
K	544.250
L	544.250
M	544.250
N	544.250
O	544.250
P	544.250
Q	544.250
R	544.250
S	544.250
T	544.250
U	544.250
V	544.250
W	544.250
X	544.250
Y	544.250
Z	544.250

Pipe profiles:

PIPE 1100 B. :

X-distance [m]	Height [m]
0.0000	544.25
23.150	544.25

PIPE BASMA BORUSU-1 :

X-distance [m]	Height [m]
0.0000	544.25
24.730	544.03
74.190	542.88
241.93	540.47
905.17	521.95
1162.8	536.76
1287.9	541.48
1434.8	542.87
1493.5	545.64
1611.2	556.25
1678.1	560.61
1708.1	561.37
2113.4	563.79
2262.5	564.32
2851.7	568.07
3095.7	594.62
3156.7	598.90
3349.6	601.52
3496.7	608.80
3676.3	620.01

PIPE BASMA BORUSU-2 :

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

X-distance	Height
[m]	[m]
0.0000	620.01
288.72	613.40
400.36	625.94
466.43	630.18

PIPE BASMA BORUSU-3 :

X-distance	Height
[m]	[m]
0.0000	630.18
256.23	625.62
312.25	627.71
424.29	634.60
1291.3	643.85
1319.4	644.85
1423.5	654.15
1495.1	657.30
1549.4	657.85

PRIGID KOL1 :

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL10 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL11 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL12 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL13 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL14 :

X-distance	Height

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

[m]	[m]
0.0000	544.25
15.200	544.25

PIPE	KOL15	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			25.380	544.25

PRIGID	KOL2	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25

PRIGID	KOL3	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25

PRIGID	KOL4	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25

PRIGID	KOL5	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25

PRIGID	KOL6	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25

PRIGID	KOL7	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25

PRIGID	KOL8	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

PRIGID	KOL9	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PIPE	Mevcut Boru	:		
			X-distance	Height
			[m]	[m]
			0.0000	550.00
			527.65	547.80
PRIGID	P-BYP	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.0000	544.25
PRIGID	P-CON	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			8.0000	544.25
			8.0000	546.55
PRIGID	P-CON.a	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			8.0000	544.25
			8.0000	546.55
PIPE	Yeni Boru	:		
			X-distance	Height
			[m]	[m]
			0.0000	547.80
			317.35	546.45
PIPE	Yeni Boru.a	:		
			X-distance	Height
			[m]	[m]
			0.0000	546.45
			0.0000	543.45
			54.490	544.25

Fluid specifications:

=====

Fluid name	:	water	[-]
density	:	1000.	[kg/m3]
bulk modulus	:	0.2100E+10	[N/m2]
vapour pressure	:	0.1707E-01	[bar.a]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

kinematic viscosity : 0.1000E-05 [m2/s]

Physical constants:

=====

gravitational acceleration : 9.810 [m/s2]
atmospheric pressure : 1.014 [bar.a]

Time parameters

=====

time step : 0.3000E-01 [s]
simulation end time : 60.00 [s]

H-component input specifications:

=====

AIRVva A2 vert. vented Model name:

Comment :
Keywords :
Reference Id :
Top level : 552.5 [m]
Bottom level : 546.5 [m]
Air inlet level : 546.8 [m]
Chamber area : 4.520 [m2]
Laplace coefficient : 1.200 [-]

AIRVvn A1 vert.n.-vent Model name:

Comment :
Keywords :
Reference Id :
Top level : 552.5 [m]
Bottom level : 546.5 [m]
Chamber area : 4.520 [m2]
Air quantity by : Air volume
Initial fluid level : [m]
Initial air volume : 13.00 [m3]
Initial C in P*V=C : [kJ]
Laplace coefficient : 1.200 [-]

BOUNDH ARITMA G. - Model name:

Comment : S: 659.00 m
Keywords :
Reference Id :
Pressure head at t = 0 [s] : 662.0 [m]

BOUNDH MENZELET BRJ - Model name:

Comment :
Keywords :
Reference Id :
Pressure head at t = 0 [s] : 560.0 [m]

CHECKV C1 delta_p Model name:

Comment :

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C2 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C3 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Open

CHECKV C4 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.600 [-]
Delta_p for reopen : 0.5000E-01 [bar]
Initial state : Closed

CHECKV C9 delta_p Model name:
Comment :
Keywords :
Reference Id :
Inner diameter : 600.0 [mm]
Loss coefficient : 1.500 [-]
Delta_p for reopen : 0.1000 [bar]
Initial state : Closed

PIPE 1100 B. Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	2
Tee; flow through branch	0.900	

PIPE BASMA BORUSU-1 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer

Inner diameter	: 1692.	[mm]
Wall roughness	: 0.1500	[mm]
Wall thickness	: 17.50	[mm]
Young's modulus	: 0.2100E+12	[N/m2]
local losses	Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	66
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	

PIPE BASMA BORUSU-2 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer

Inner diameter	: 1692.	[mm]
Wall roughness	: 0.1500	[mm]
Wall thickness	: 17.50	[mm]
Young's modulus	: 0.2100E+12	[N/m2]
local losses	Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	11
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	

```

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir
Tee; flow through branch                                0.900

```

PIPE	BASMA BORUSU-3	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Waterhammer	
	Inner diameter	:	1692. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	17.50 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses	Loss coef Xi	Number
Diameter			
		[-]	
[mm]			
	Elbow 90 degr; R=1.5D	0.200	
	Elbow 45 degr; R=1.5D	0.120	
	Elbow 22,5 degr; R=1.5D	0.800E-01	17
	Elbow 11,25 degr; R=1.5D	0.500E-01	
	Tee; flow through run	0.300	
	Tee; flow through branch	0.900	

PIPE	KOL15	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:	Waterhammer	
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number
Diameter			
			[-]
[mm]			
	Elbow 90 degr; R=1.5D		0.200
	Elbow 45 degr; R=1.5D		0.120
	Elbow 22,5 degr; R=1.5D		0.800E-01
	Elbow 11,25 degr; R=1.5D		0.500E-01
	Tee; flow through run		0.300 1
	Tee; flow through branch		0.900

PIPE	Mevcut Boru	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:	St	
	Calculation mode:	Waterhammer		
	Inner diameter	:	1495.	[mm]
	Wall roughness	:	0.1500	[mm]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Wall thickness : 14.30 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	1
Elbow 45 degr; R=1.5D	0.120	1
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PIPE

Yeni Boru

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	1
Elbow 45 degr; R=1.5D	0.120	1
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PIPE

Yeni Boru.a

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	1
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Tee; flow through run 0.300 1
Tee; flow through branch 0.900

PRIGID KOL1 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number
Diameter
[mm]
Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900

PRIGID KOL10 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 600.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number
Diameter
[mm]
Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL11 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL12 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL13 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL14	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Rigid column
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL2	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Rigid column
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL3	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Rigid column

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL4 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	700.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL5 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL6	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL7	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL8	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Calculation mode: Rigid column

Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL9 Pipe_Xi Model name:

Comment	:
Keywords	:
Reference Id	:
Material name	: St
Calculation mode:	Rigid column
Inner diameter	: 700.0 [mm]
Wall roughness	: 0.1500 [mm]
Wall thickness	: 11.00 [mm]
Young's modulus	: 0.2100E+12 [N/m2]
local losses	Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID P-BYP Pipe_Xi Model name:

Comment	:
Keywords	:
Reference Id	:
Material name	:
Calculation mode:	Rigid column
Inner diameter	: 200.0 [mm]
Wall roughness	: 0.1500 [mm]
Wall thickness	: 4.000 [mm]
Young's modulus	: 0.2100E+12 [N/m2]
local losses	Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	2

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	2
STRAINER.....	2.00	

PRIGID	P-CON	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	
	Calculation mode:	Rigid column	
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	4.000 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	2
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	
STRAINER.....	2.00	

PRIGID	P-CON.a	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	
	Calculation mode:	Rigid column	
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	4.000 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	2
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	
STRAINER.....	2.00	

PUMP	P1	Model name:

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Discharge
 Initial speed : [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Start time (0 to max) : [s]
Stop time (max to 0) : [s]

PUMP

P2

Model name:

Comment :
Keywords :
Reference Id : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table

Suter : Table

Rated speed : 1450. [rpm]

Q in best point of eff. : [l/s]

H in best point of eff. : [m]

T in best point of eff. : [kNm]

Initial setting : Discharge

Initial speed : [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

Trip time : 0.000 [s]

Action table speed : Table

Action table motorfreq. : Table

Minimum speed for tripping : 20.00 [rpm]

Minimum rel.freq. for tripping: [%]

Required speed : [rpm]

Minimum speed : [rpm]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Maximum speed : [rpm]
Maximum power : [kW]
Level ON : [m]
Level OFF : [m]
Start time (0 to max) : [s]
Stop time (max to 0) : [s]

PUMP

P3

Model name:

Comment :
Keywords :
Reference Id : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table
Suter : Table
Rated speed : 1450. [rpm]
Q in best point of eff. : [l/s]
H in best point of eff. : [m]
T in best point of eff. : [kNm]
Initial setting : Discharge
Initial speed : [rpm]
Initial suction head : [m]
Initial pressure head : [m]
Initial discharge : 500.0 [l/s]
Initial relative frequency : [%]
Speed-Torque char. of motor : Table
Polar moment of inertia : 30.00 [kgm2]
Drive type : Trip
Trip time : 0.000 [s]
Action table speed : Table
Action table motorfreq. : Table

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P4

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Speed
 Initial speed : 0.000 [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

VALVE 200 BV6 Universal Model name: SMS 700 BV

Comment :
 Keywords :
 Reference Id :

Characteristic type : Standard
 Standard type : Gate
 Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.800	499.80
24.300	2408.8
57.900	7840.0
77.800	16125.
84.400	19600.
100.00	29380.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 150.0 [mm]
 Initial setting : Position

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Initial position (open) : 50.00 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE 600 BV1 Universal Model name: SMS 600 BV

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Gate
 Kv Characteristic : Table

Position open [%]	Kv [m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE 600 BV5 Universal Model name: SMS 600 BV

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Gate
 Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV1 Universal Model name:

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
9.1600	2089.7
29.600	3678.4
49.300	14351.
66.600	32029.
69.400	36300.
84.500	60500.
100.00	96800.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 1100. [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV2 Universal Model name:
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Kv Characteristic	: Table
	Position open Kv
	[%] [m3/h/(bar) ^½]
	0.0000 0.0000
	10.700 392.00
	27.800 2000.0
	44.400 4713.0
	63.100 10000.
	77.700 16000.
	90.900 24000.
	100.00 32610.

Cv Characteristic : Table

Xi Characteristic : Table

	Position open Xi
	[%] [-]
	0.0000 0.15740E+07
	2.5000 3404.0
	5.0000 1532.0
	10.000 663.80
	20.000 221.27
	30.000 73.200
	40.000 28.933
	50.000 11.407
	60.000 4.7660
	70.000 2.2127
	80.000 0.93600
	90.000 0.51067
	94.000 0.45960
	97.000 0.40853
	100.00 0.40000

Inner diameter	: 700.0 [mm]
Initial setting	: Position
Initial position (open)	: 100.0 [%]
Initial upstream head	: [m]
Initial downstream head	: [m]
Initial discharge	: [l/s]
Initial upstream pressure	: [barg]
Initial downstream pressure	: [barg]
Check cavitation	: No
Cavitation table	: Table

VALVE EV3 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

	Position open Kv
	[%] [m3/h/(bar) ^½]
	0.0000 0.0000
	10.700 392.00

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter	: 700.0	[mm]
Initial setting	: Position	
Initial position (open)	: 100.0	[%]
Initial upstream head	:	[m]
Initial downstream head	:	[m]
Initial discharge	:	[l/s]
Initial upstream pressure	:	[barg]
Initial downstream pressure	:	[barg]
Check cavitation	: No	
Cavitation table	: Table	

VALVE EV4 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

100.00 32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE EV5 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 600 BV Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 601 Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter	:	600.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	100.0	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]
Initial discharge	:		[l/s]
Initial upstream pressure	:		[barg]
Initial downstream pressure	:		[barg]
Check cavitation	:	No	
Cavitation table	:	Table	

VALVE SMS 602 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 603 Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]

3.1.3 INPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wir
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

Calculated pipe data:

=====

PIPE		length [m]	C_calc [m/s]	C_adapt [m/s]	N_elem [-]
PIPE	1100 B.	23.150	1025.	772.	1
PIPE	BASMA BORUSU-1	3679.934	1033.	1031.	119
PIPE	BASMA BORUSU-2	467.344	1033.	1039.	15
PIPE	BASMA BORUSU-3	1550.225	1033.	1033.	50
PRIGID	KOL1	4.250	used as rigid column		
PRIGID	KOL10	15.200	used as rigid column		
PRIGID	KOL11	7.100	used as rigid column		
PRIGID	KOL12	15.200	used as rigid column		
PRIGID	KOL13	7.100	used as rigid column		
PRIGID	KOL14	15.200	used as rigid column		
PIPE	KOL15	25.380	1025.	846.	1
PRIGID	KOL2	4.250	used as rigid column		
PRIGID	KOL3	4.250	used as rigid column		
PRIGID	KOL4	7.100	used as rigid column		
PRIGID	KOL5	15.200	used as rigid column		
PRIGID	KOL6	4.250	used as rigid column		
PRIGID	KOL7	4.250	used as rigid column		
PRIGID	KOL8	4.250	used as rigid column		
PRIGID	KOL9	7.100	used as rigid column		
PIPE	Mevcut Boru	527.655	1013.	1035.	17
PRIGID	P-BYP	4.000	used as rigid column		
PRIGID	P-CON	10.300	used as rigid column		
PRIGID	P-CON.a	10.300	used as rigid column		
PIPE	Yeni Boru	317.353	1033.	1058.	10
PIPE	Yeni Boru.a	57.496	1033.	958.	2

Active H-components:

=====

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 01:16:45

Case : 3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

Title: 3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

Case description:
=====

3.1.3 K.MARAS 1.KD -KAZANLI -03 JUL 17

Steady state results:

Pipes:

Name v	length [m]	lambda [-]	wall rough. [mm]	c_calc [m/s]	c_adapt [m/s]	N_elem [-]	Q [l/s]
1100 B. 1.578	23.15	0.0420	0.150	1024.70	771.67	1	1500.000
BASMA BORUSU-1 0.667	3679.93	0.0156	0.150	1033.29	1030.79	119	1500.000
BASMA BORUSU-2 0.667	467.34	0.0163	0.150	1033.29	1038.54	15	1500.000
BASMA BORUSU-3 0.667	1550.22	0.0146	0.150	1033.29	1033.48	50	1500.000
KOL15 1.578	25.38	0.0265	0.150	1024.70	846.00	1	1500.000
Mevcut Boru 0.855	527.65	0.0175	0.150	1013.25	1034.62	17	1500.000
Yeni Boru 0.667	317.35	0.0164	0.150	1033.29	1057.84	10	1500.000
Yeni Boru.a 0.667	57.50	0.0255	0.150	1033.29	958.26	2	1500.000

Discharges and velocities through H-components:

H-component	discharge [l/s]	velocity [m/s]
AIRVva A2	0.000	
AIRVvn A1	0.000	
BOUNDH ARITMA G.	-1500.000	
BOUNDH MENZELET BRJ	1500.000	

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

CHECKV	C1	500.000	1.768
CHECKV	C2	500.000	1.768
CHECKV	C3	500.000	1.768
CHECKV	C4	0.000	
CHECKV	C9	0.000	
PRIGID	KOL1	1000.000	1.052
PRIGID	KOL10	500.000	1.768
PRIGID	KOL11	500.000	1.299
PRIGID	KOL12	500.000	1.768
PRIGID	KOL13	0.000	
PRIGID	KOL14	0.000	
PRIGID	KOL2	500.000	0.526
PRIGID	KOL3	0.000	
PRIGID	KOL4	500.000	1.299
PRIGID	KOL5	500.000	1.768
PRIGID	KOL6	500.000	0.526
PRIGID	KOL7	1000.000	1.052
PRIGID	KOL8	1500.000	1.578
PRIGID	KOL9	500.000	1.299
PRIGID	P-BYP	0.000	
PRIGID	P-CON	0.000	
PRIGID	P-CON.a	0.000	
PUMP	P1	500.000	
PUMP	P2	500.000	
PUMP	P3	500.000	
PUMP	P4	0.000	
VALVE	200 BV6	0.000	
VALVE	600 BV1	0.000	
VALVE	600 BV5	0.000	
VALVE	EV1	1500.000	1.578
VALVE	EV2	500.000	1.299
VALVE	EV3	500.000	1.299
VALVE	EV4	500.000	1.299
VALVE	EV5	0.000	
VALVE	SMS 600 BV	500.000	1.768
VALVE	SMS 601	500.000	1.768
VALVE	SMS 602	500.000	1.768
VALVE	SMS 603	0.000	

Pressures and heads in H-nodes:

H-node	pressure [barg]	head [m]
A	0.98	560.000
AA	1.49	559.512
AB	1.49	559.512
AC	11.67	663.251
AC.b	11.66	663.174
AD	11.67	663.251
AD.b	11.66	663.174
AE	1.49	559.512

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

AE.b	11.44	663.174
AE.c	1.28	559.681
AF	11.67	663.251
AF.b	11.66	663.174
B	1.17	559.770
BD	4.15	662.406
BE	3.15	662.304
BF	0.40	662.000
BG	1.51	559.681
BR1	1.51	559.681
BR2	11.66	663.174
C	1.30	559.700
D	1.50	559.537
E	1.49	559.517
F	1.49	559.512
G	1.51	559.649
H	11.68	663.316
I	11.67	663.296
J	1.48	559.400
K	1.48	559.369
L	11.74	663.935
M	11.71	663.680
N	11.70	663.612
O	11.68	663.321
P	1.48	559.380
Q	1.48	559.349
R	11.74	663.930
S	11.71	663.675
T	11.70	663.607
U	1.48	559.375
V	1.48	559.344
W	11.73	663.910
X	11.71	663.655
Y	11.70	663.587
Z	1.49	559.512

Additional H-component output:

AIRVva	A2	Fluid level	549.634	[m]
		Air pressure	0.986	[barg]
AIRVvn	A1	Fluid level	549.674	[m]
		Air pressure	11.134	[barg]
PUMP	P1	Air volume	13.000	[m3]
		Pump speed	1315.977	[rpm]
		Fluid torque	4.419	[kNm]
		Motor torque	4.419	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.223	[%]
		Power	608.976	[kW]
		Energy	0.000	[kJ]
PUMP	P2	Pump speed	1316.049	[rpm]
		Fluid torque	4.419	[kNm]

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

		Motor torque	4.419	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.223	[%]
		Power	609.060	[kW]
		Energy	0.000	[kJ]
PUMP	P3	Pump speed	1315.977	[rpm]
		Fluid torque	4.419	[kNm]
		Motor torque	4.419	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.223	[%]
		Power	608.976	[kW]
		Energy	0.000	[kJ]
PUMP	P4	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	84.223	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
VALVE	200 BV6	Valve position (open)	50.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV1	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV1	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV2	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV3	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV4	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	SMS 600 BV	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 601	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 602	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 603	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]

Extreme values in pipes:

Head:

Pipe location	minimum	time	location	maximum	time	
	[m]	[s]	[m]	[m]	[s]	[m]

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

1100 B. 23.15	549.777	20.100	23.15	583.680	6.240
BASMA BORUSU-1 0.00	606.202	11.880	30.92	701.660	22.920
BASMA BORUSU-2 0.00	629.142	7.500	0.00	680.257	19.320
BASMA BORUSU-3 0.00	634.259	7.050	0.00	677.147	18.870
KOL15 0.00	602.972	11.820	0.00	705.552	22.920
Mevcut Boru 527.65	550.226	1.710	186.23	579.723	6.360
Yeni Boru 253.88	549.134	20.190	190.41	584.491	6.390
Yeni Boru.a 0.00	549.599	22.170	0.00	583.923	6.330

Pressure:

Pipe location [m]	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]
1100 B. 23.15	0.542	20.100	23.15	3.868	6.240
BASMA BORUSU-1 896.79	0.896	7.500	3679.93	16.777	23.820
BASMA BORUSU-2 280.41	0.400	7.050	467.34	6.364	19.050
BASMA BORUSU-3 248.04	-0.047	17.310	1488.22	4.852	18.630
KOL15 0.00	5.761	11.820	0.00	15.824	22.920
Mevcut Boru 527.65	0.087	1.650	124.15	3.132	6.360
Yeni Boru 253.88	0.188	22.110	126.94	3.705	6.390
Yeni Boru.a 28.75	0.309	22.170	0.00	3.842	6.300

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
BASMA BORUSU-1	0.000	0.000	0.00
BASMA BORUSU-2	0.000	0.000	0.00
BASMA BORUSU-3	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

Extreme discharges through H-components:

H-component	minimum [l/s]	time [s]	maximum [l/s]	time [s]
AIRVva A2	-1464.187	1.080	1315.377	11.700
AIRVvn A1	-371.055	22.950	1306.975	0.840
BOUNDH ARITMA G.	-1500.001	0.030	1262.626	17.370
BOUNDH MENZELET BRJ	-1333.244	12.690	1500.000	0.060
CHECKV C1	0.000	0.840	500.000	0.000
CHECKV C2	0.000	0.660	500.000	0.000
CHECKV C3	0.000	0.660	500.000	0.000
CHECKV C4	0.000	0.360	0.000	0.030
CHECKV C9	0.000	0.000	1275.658	0.810
PRIGID KOL1	0.000	0.750	1000.000	0.000
PRIGID KOL10	0.000	0.660	500.000	0.000
PRIGID KOL11	0.000	0.660	500.000	0.000
PRIGID KOL12	0.000	0.660	500.000	0.000
PRIGID KOL13	0.000	0.240	0.000	0.030
PRIGID KOL14	0.000	0.000	0.000	0.000
PRIGID KOL2	0.000	0.660	500.000	0.000
PRIGID KOL3	0.000	0.270	0.000	0.030
PRIGID KOL4	0.000	8.670	500.000	0.000
PRIGID KOL5	0.000	0.660	500.000	0.000
PRIGID KOL6	0.000	0.660	500.000	0.000
PRIGID KOL7	0.000	0.660	1000.000	0.000
PRIGID KOL8	0.000	10.020	1500.000	0.000
PRIGID KOL9	0.000	7.830	500.000	0.000
PRIGID P-BYP	-47.119	1.410	371.055	22.950
PRIGID P-CON	-1306.975	0.840	371.055	22.950
PRIGID P-CON.a	-1315.377	11.700	1464.187	1.080
PUMP P1	0.000	0.840	500.000	0.000
PUMP P2	0.000	0.660	500.000	0.000
PUMP P3	0.000	0.660	500.000	0.000
PUMP P4	0.000	0.000	0.000	0.000
VALVE 200 BV6	-371.055	22.950	47.119	1.410
VALVE 600 BV1	-1464.187	1.080	1315.377	11.700
VALVE 600 BV5	-371.055	22.950	1306.975	0.840
VALVE EV1	-73.948	0.690	1500.000	0.030
VALVE EV2	0.000	0.840	500.000	0.000
VALVE EV3	0.000	0.660	500.000	0.000
VALVE EV4	0.000	0.660	500.000	0.000
VALVE EV5	0.000	0.360	0.000	0.030
VALVE SMS 600 BV	0.000	0.660	500.000	0.000
VALVE SMS 601	0.000	0.660	500.000	0.000
VALVE SMS 602	0.000	0.660	500.000	0.000
VALVE SMS 603	0.000	0.360	0.000	0.030

Extreme pressure heads in H-nodes:

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

H-node	minimum [m]	time [s]	maximum [m]	time [s]
A	560.000	0.000	560.000	0.000
AA	549.777	20.100	583.680	6.240
AB	549.777	20.100	583.680	6.240
AC	602.972	11.820	705.552	22.920
AC.b	606.442	11.850	701.622	22.920
AD	602.972	11.820	705.552	22.920
AD.b	606.442	11.850	665.619	52.200
AE	549.777	20.100	583.680	6.240
AE.b	609.115	11.460	665.738	52.380
AE.c	550.807	21.540	579.254	6.900
AF	602.972	11.820	705.552	22.920
AF.b	604.886	11.850	665.565	56.220
B	550.376	22.230	579.723	6.360
BD	629.142	7.500	680.257	19.320
BE	634.259	7.050	677.147	18.870
BF	662.000	0.000	662.000	0.000
BG	550.045	22.110	581.998	6.270
BR1	550.046	22.110	581.998	6.270
BR2	606.442	11.850	701.660	22.920
C	549.599	22.170	583.923	6.330
D	549.777	20.100	583.680	6.240
E	549.777	20.100	583.680	6.240
F	549.777	20.100	583.680	6.240
G	550.046	22.110	581.998	6.270
H	602.972	11.820	705.552	22.920
I	602.972	11.820	705.552	22.920
J	549.777	20.100	583.680	6.240
K	549.777	20.100	583.680	6.240
L	550.247	22.110	663.935	0.000
M	602.972	11.820	705.552	22.920
N	602.972	11.820	705.552	22.920
O	602.972	11.820	705.552	22.920
P	549.777	20.100	583.680	6.240
Q	549.777	20.100	583.680	6.240
R	550.247	22.110	663.930	0.000
S	602.972	11.820	705.552	22.920
T	602.972	11.820	705.552	22.920
U	549.777	20.100	583.680	6.240
V	549.777	20.100	583.680	6.240
W	550.247	22.110	663.910	0.000
X	602.972	11.820	705.552	22.920
Y	602.972	11.820	705.552	22.920
Z	549.777	20.100	583.680	6.240

Extreme pressures in H-nodes:

H-node	minimum [barg]	time [s]	maximum [barg]	time [s]

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

A	0.981	0.000	0.981	0.000
AA	0.542	20.100	3.868	6.240
AB	0.542	20.100	3.868	6.240
AC	5.761	11.820	15.824	22.920
AC.b	6.101	11.850	15.438	22.920
AD	5.761	11.820	15.824	22.920
AD.b	6.101	11.850	11.906	52.200
AE	0.542	20.100	3.868	6.240
AE.b	6.138	11.460	11.692	52.380
AE.c	0.418	21.540	3.208	6.900
AF	5.761	11.820	15.824	22.920
AF.b	5.948	11.850	11.901	56.220
B	0.253	22.230	3.132	6.360
BD	0.896	7.500	5.910	19.320
BE	0.400	7.050	4.607	18.870
BF	0.407	0.000	0.407	0.000
BG	0.568	22.110	3.703	6.270
BR1	0.569	22.110	3.703	6.270
BR2	6.101	11.850	15.442	22.920
C	0.309	22.170	3.676	6.330
D	0.542	20.100	3.868	6.240
E	0.542	20.100	3.868	6.240
F	0.542	20.100	3.868	6.240
G	0.569	22.110	3.703	6.270
H	5.761	11.820	15.824	22.920
I	5.761	11.820	15.824	22.920
J	0.542	20.100	3.868	6.240
K	0.542	20.100	3.868	6.240
L	0.588	22.110	11.741	0.000
M	5.761	11.820	15.824	22.920
N	5.761	11.820	15.824	22.920
O	5.761	11.820	15.824	22.920
P	0.542	20.100	3.868	6.240
Q	0.542	20.100	3.868	6.240
R	0.588	22.110	11.741	0.000
S	5.761	11.820	15.824	22.920
T	5.761	11.820	15.824	22.920
U	0.542	20.100	3.868	6.240
V	0.542	20.100	3.868	6.240
W	0.588	22.110	11.739	0.000
X	5.761	11.820	15.824	22.920
Y	5.761	11.820	15.824	22.920
Z	0.542	20.100	3.868	6.240

Extreme values of additional H-component output:

H-component	minimum	time [s]	maximum	time [s]
AIRVva A2 Fluid level [m]	548.272	21.540	550.843	6.900

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

Air pressure [barg]	0.986	0.000	3.801	6.900
AIRVvn A1				
Fluid level [m]	548.002	11.460	549.721	52.230
Air pressure [barg]	5.995	11.460	11.381	52.380
Air volume [m3]	12.784	52.380	20.558	11.460
PUMP P1				
Pump speed [rpm]	28.890	60.000	1315.977	0.000
Fluid torque [kNm]	0.001	60.000	4.419	0.000
Motor torque [kNm]	0.000	0.030	4.419	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.030	608.976	0.000
Energy [kJ]	0.000	0.000	18.269	0.030
PUMP P2				
Pump speed [rpm]	28.889	60.000	1316.049	0.000
Fluid torque [kNm]	0.001	60.000	4.419	0.000
Motor torque [kNm]	0.000	0.030	4.419	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.030	609.060	0.000
Energy [kJ]	0.000	0.000	18.272	0.030
PUMP P3				
Pump speed [rpm]	28.890	60.000	1315.977	0.000
Fluid torque [kNm]	0.001	60.000	4.419	0.000
Motor torque [kNm]	0.000	0.030	4.419	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.030	608.976	0.000
Energy [kJ]	0.000	0.000	18.269	0.030
PUMP P4				
Pump speed [rpm]	0.000	0.000	0.000	0.000
Fluid torque [kNm]	0.000	0.000	0.000	0.000
Motor torque [kNm]	0.000	0.000	0.000	0.000
ON/OFF [-]	0.000	0.000	0.000	0.000
Efficiency [%]	0.000	0.030	84.223	0.000
Power [kW]	0.000	0.000	0.000	0.000
Energy [kJ]	0.000	0.000	0.000	0.000
VALVE 200 BV6				
Valve position (open) [%]	50.000	0.000	50.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.008	1.470
VALVE 600 BV1				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.019	13.440
VALVE 600 BV5				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.004	0.810
VALVE EV1				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.660	0.001	0.000
VALVE EV2				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.660	0.001	0.000

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

VALVE	EV3				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.660	0.001	0.000
VALVE	EV4				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.660	0.001	0.000
VALVE	EV5				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.000	0.000	0.000
VALVE	SMS 600 BV				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.660	0.001	0.030
VALVE	SMS 601				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.660	0.001	0.030
VALVE	SMS 602				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.660	0.001	0.000
VALVE	SMS 603				
	Valve position (open) [%]	100.000	0.000	100.000	0.000
	Pressure ratio Xf [-]	0.000	0.000	0.000	0.000

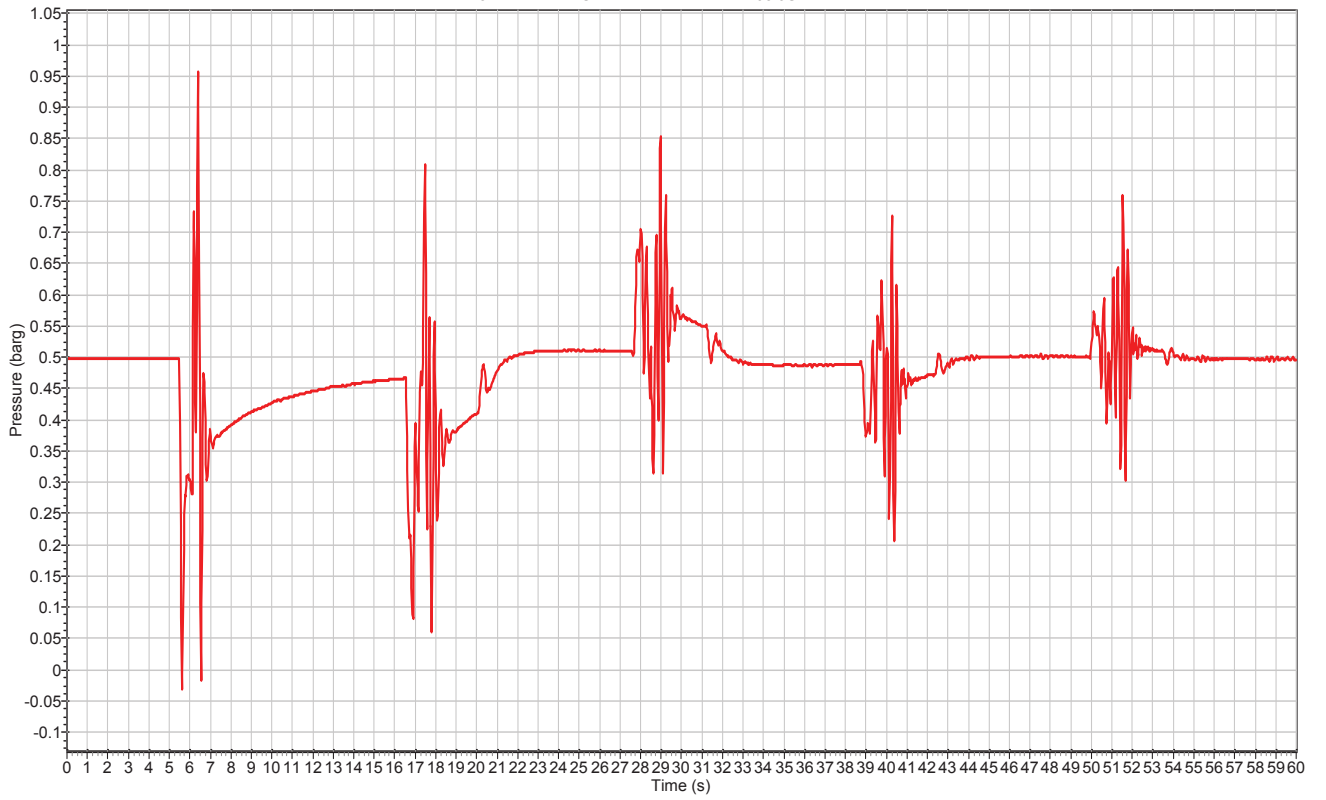
Component messages:

At	0.0000	s	VALVE	EV1	Starts in open phase
At	0.0000	s	VALVE	600 BV1	Starts in open phase
At	0.0000	s	VALVE	EV2	Starts in open phase
At	0.0000	s	PUMP	P1	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 600 BV	Starts in open phase
At	0.0000	s	VALVE	EV3	Starts in open phase
At	0.0000	s	PUMP	P2	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 601	Starts in open phase
At	0.0000	s	VALVE	EV4	Starts in open phase
At	0.0000	s	PUMP	P3	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 602	Starts in open phase
At	0.0000	s	VALVE	EV5	Starts in open phase
At	0.0000	s	PUMP	P4	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 603	Starts in open phase
At	0.0000	s	VALVE	600 BV5	Starts in open phase
At	0.0000	s	VALVE	200 BV6	Starts in open phase
At	0.0000	s	PUMP	P1	Initial pump speed = 1315.977 [rpm]
At	0.0000	s	PUMP	P2	Initial pump speed = 1316.049 [rpm]
At	0.0000	s	PUMP	P3	Initial pump speed = 1315.977 [rpm]
At	0.0000	s	AIRVva	A2	Air inlet is closed
At	0.0000	s	CHECKV	C1	Starts in open phase
At	0.0000	s	CHECKV	C2	Starts in open phase
At	0.0000	s	CHECKV	C3	Starts in open phase
At	0.0000	s	CHECKV	C4	Starts in closed phase
At	0.0000	s	CHECKV	C9	Starts in closed phase
At	0.30000E-01	s	PUMP	P1	tripping
At	0.30000E-01	s	PUMP	P2	tripping
At	0.30000E-01	s	PUMP	P3	tripping

3.1.3 OUTPUT - K.MARAS 1.KD -KAZANLI -03 JUL 17.wor

At	0.30000E-01	s	PUMP	P4	tripping
At	0.60000E-01	s	CHECKV	C9	Opens
At	0.66000	s	CHECKV	C1	Closes
At	0.66000	s	CHECKV	C3	Closes
At	0.66000	s	CHECKV	C2	Closes
At	11.430	s	CHECKV	C9	Closes
At	11.850	s	CHECKV	C9	Opens
At	12.060	s	CHECKV	C9	Closes
At	33.930	s	CHECKV	C9	Opens
At	34.380	s	CHECKV	C9	Closes
At	54.180	s	CHECKV	C9	Opens

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17

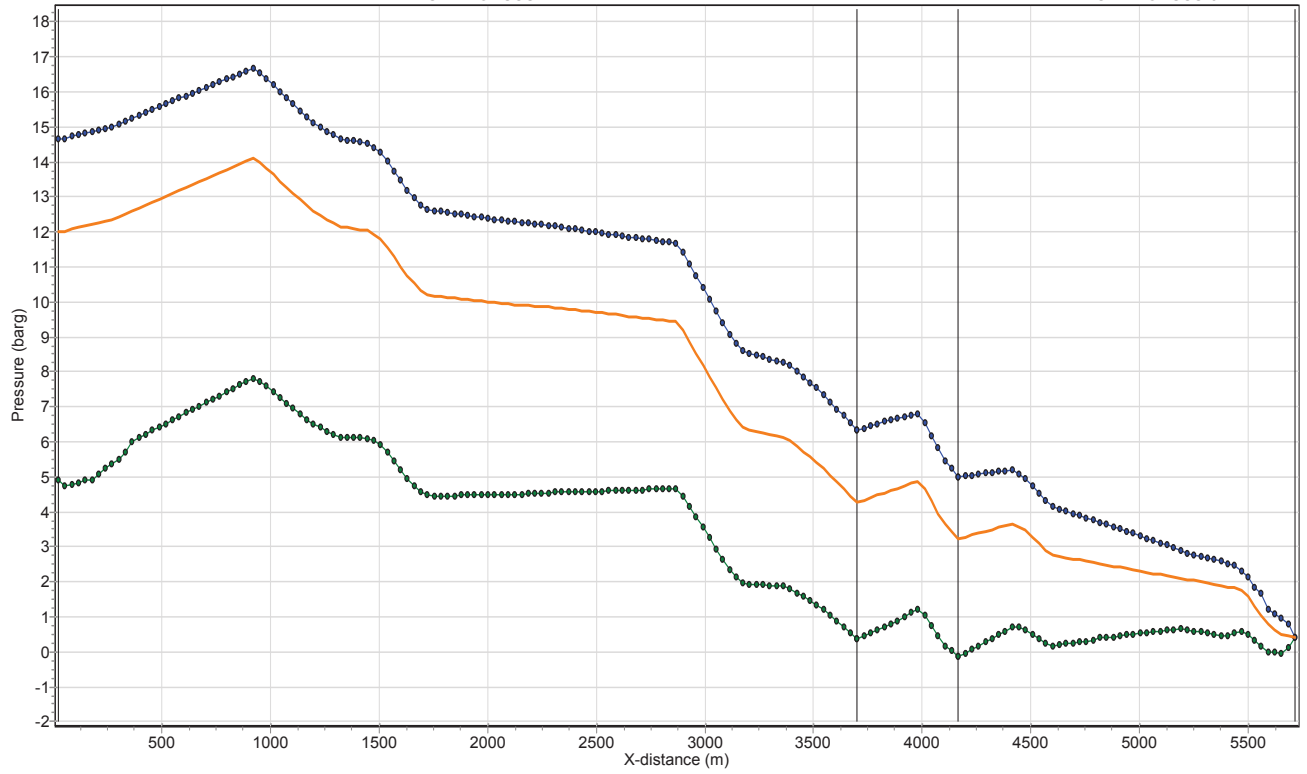


— Pressure PIPE BASMA BORUSU-3 5654 m (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17

PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



Labels

Pressure min (MARAS IS)

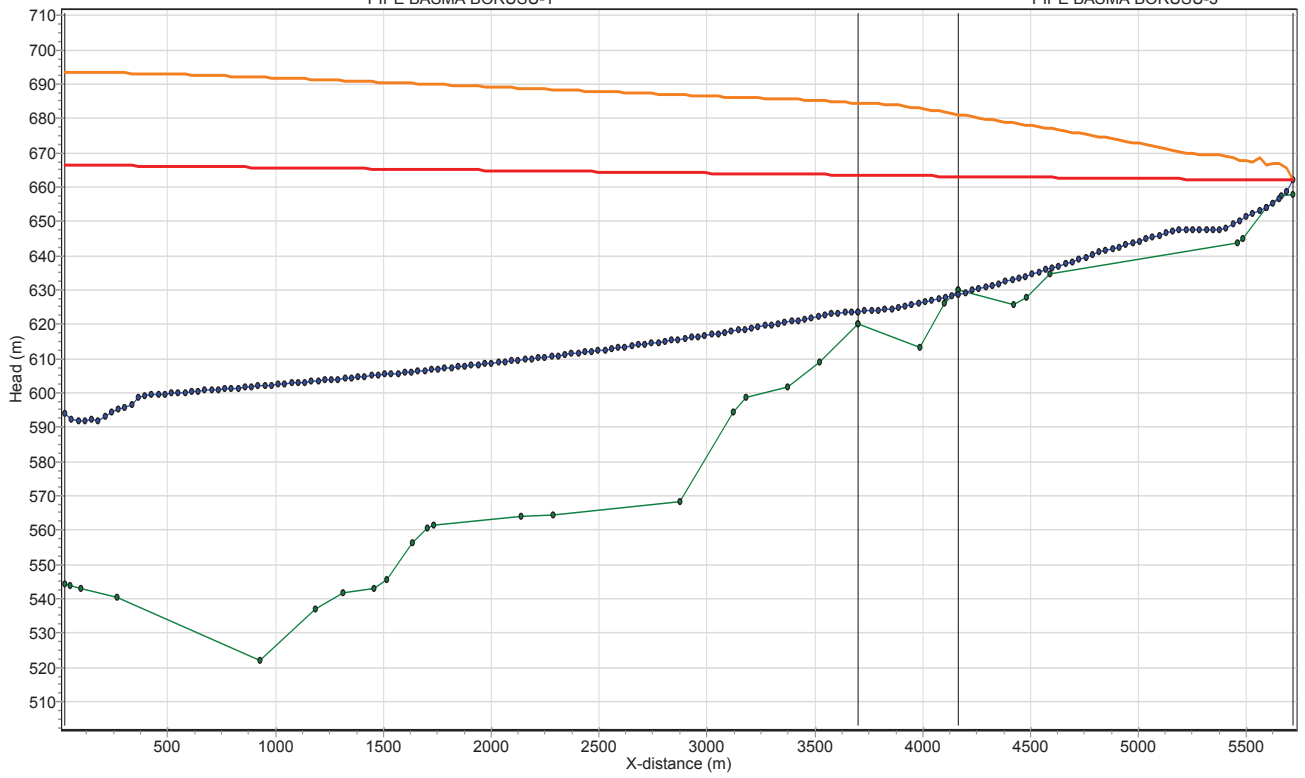
Pressure max (MARAS IS)

Pressure 0.00s (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17

PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



Labels

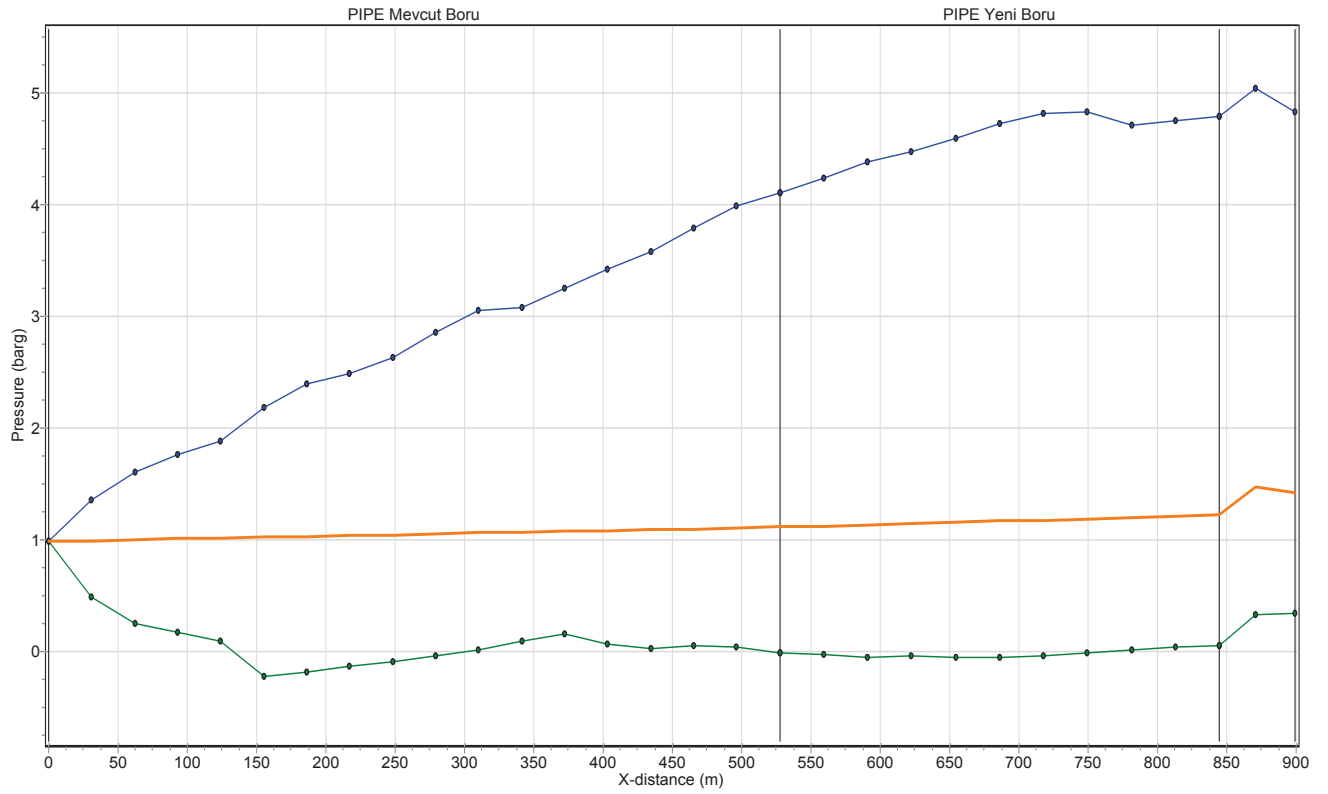
Profile (MARAS IS)

Head min (MARAS IS)

Head max (MARAS IS)

Head 0.00s (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



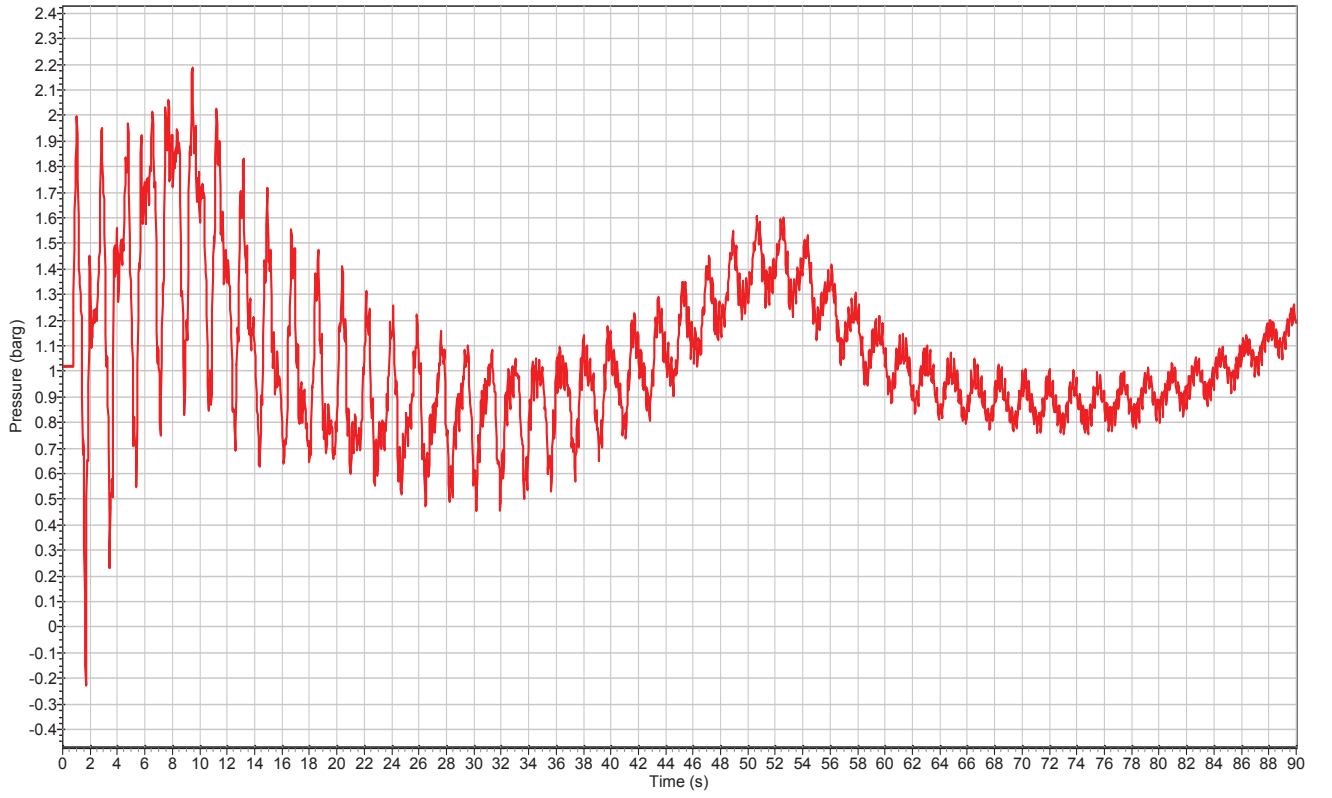
Labels

Pressure min (MARAS IS)

Pressure max (MARAS IS)

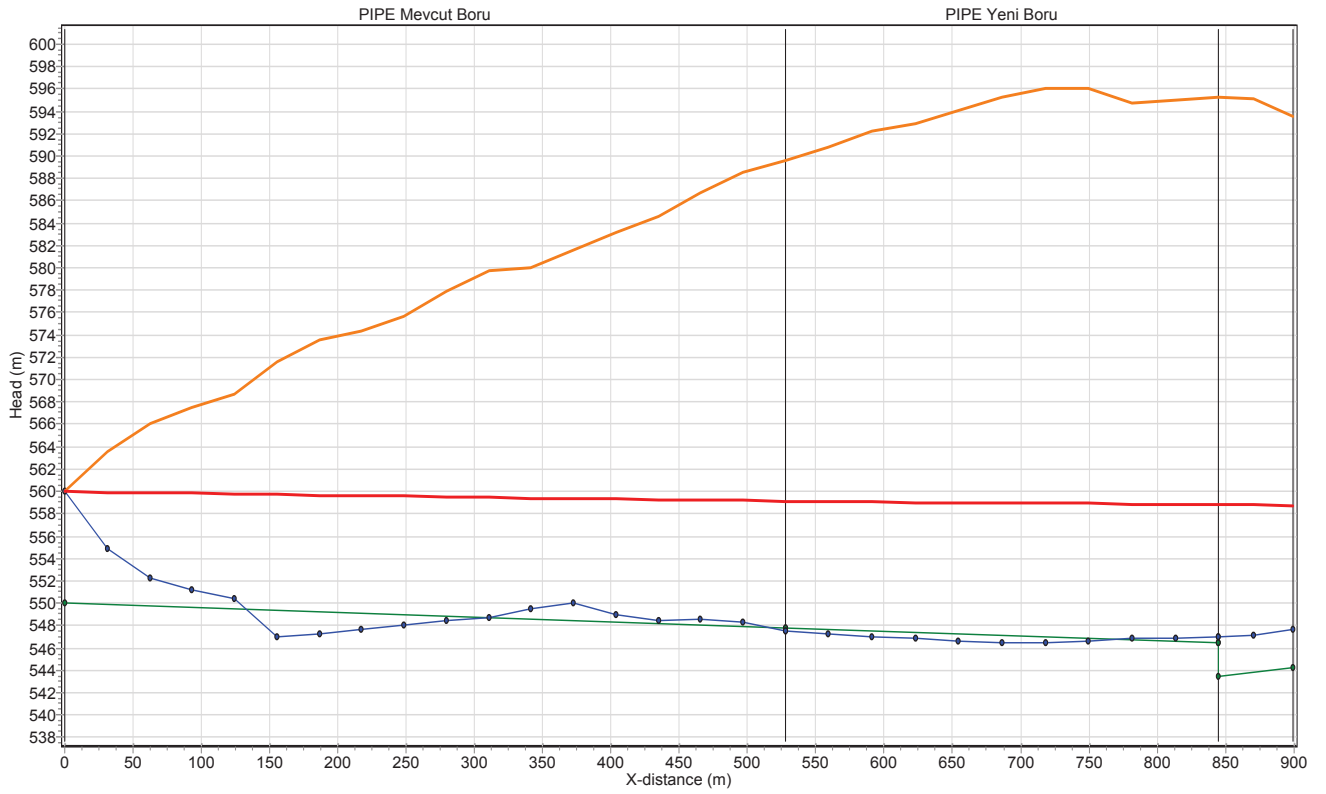
Pressure 0.00s (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



— Pressure PIPE Mevcut Boru 155.2 m (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



Labels

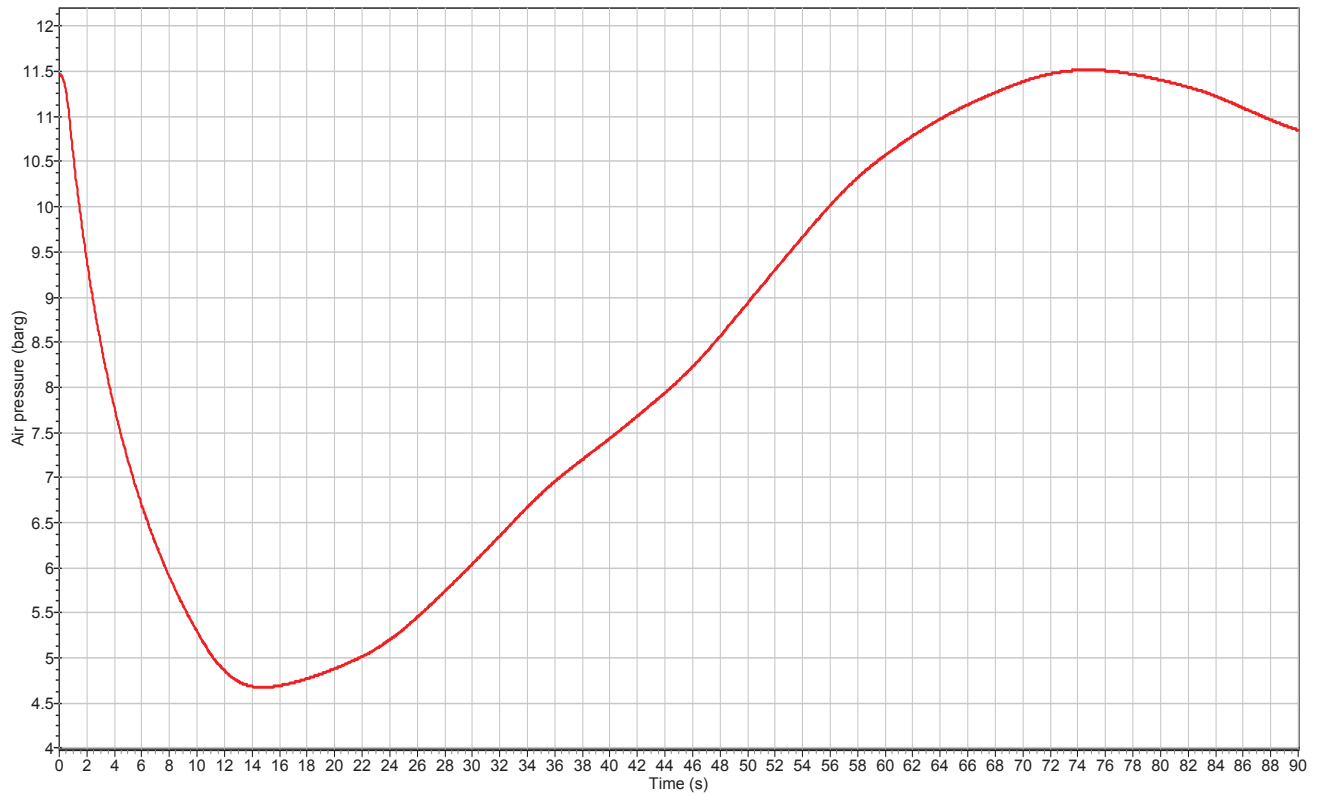
Profile (MARAS IS)

Head min (MARAS IS)

Head max (MARAS IS)

Head 0.00s (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



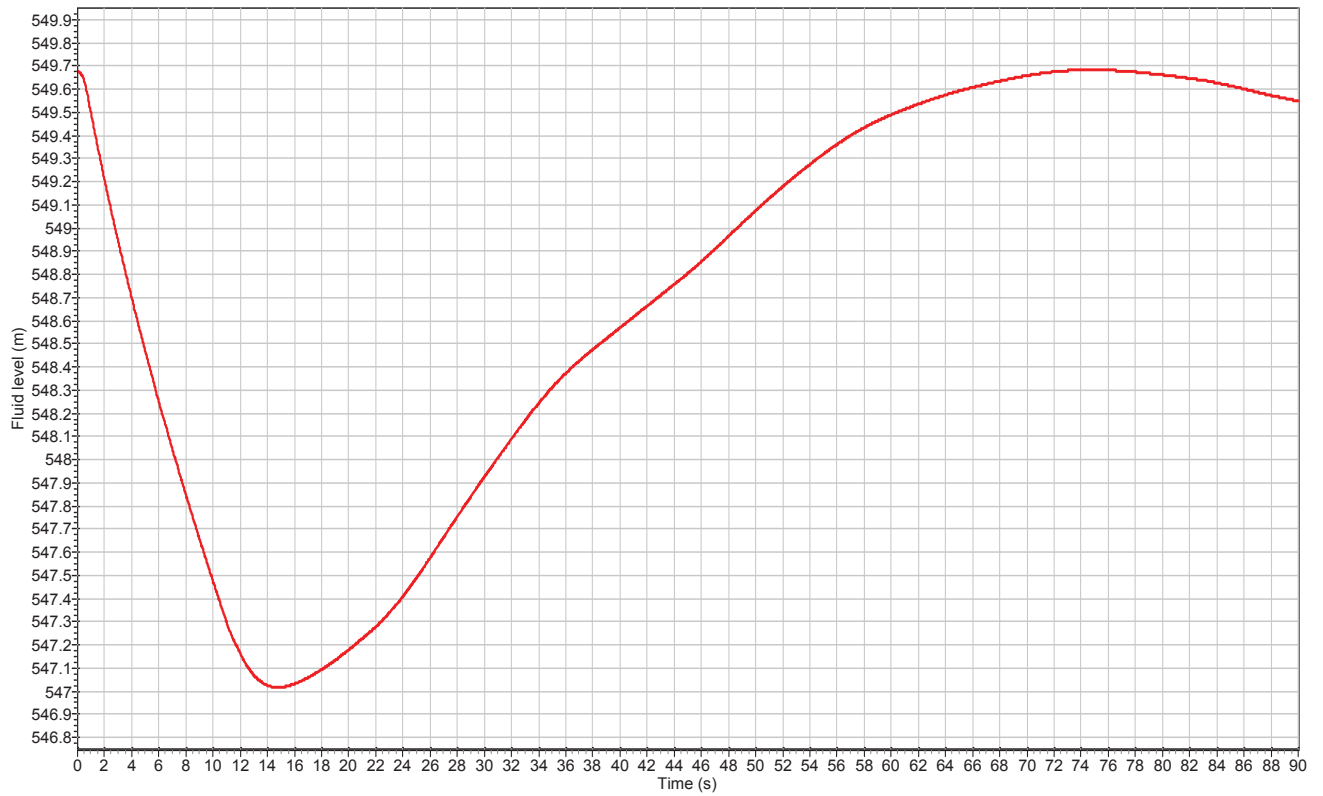
— Air pressure AIRVn A2 (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



— Air volume AIRV/vn A2 (MARAS IS)

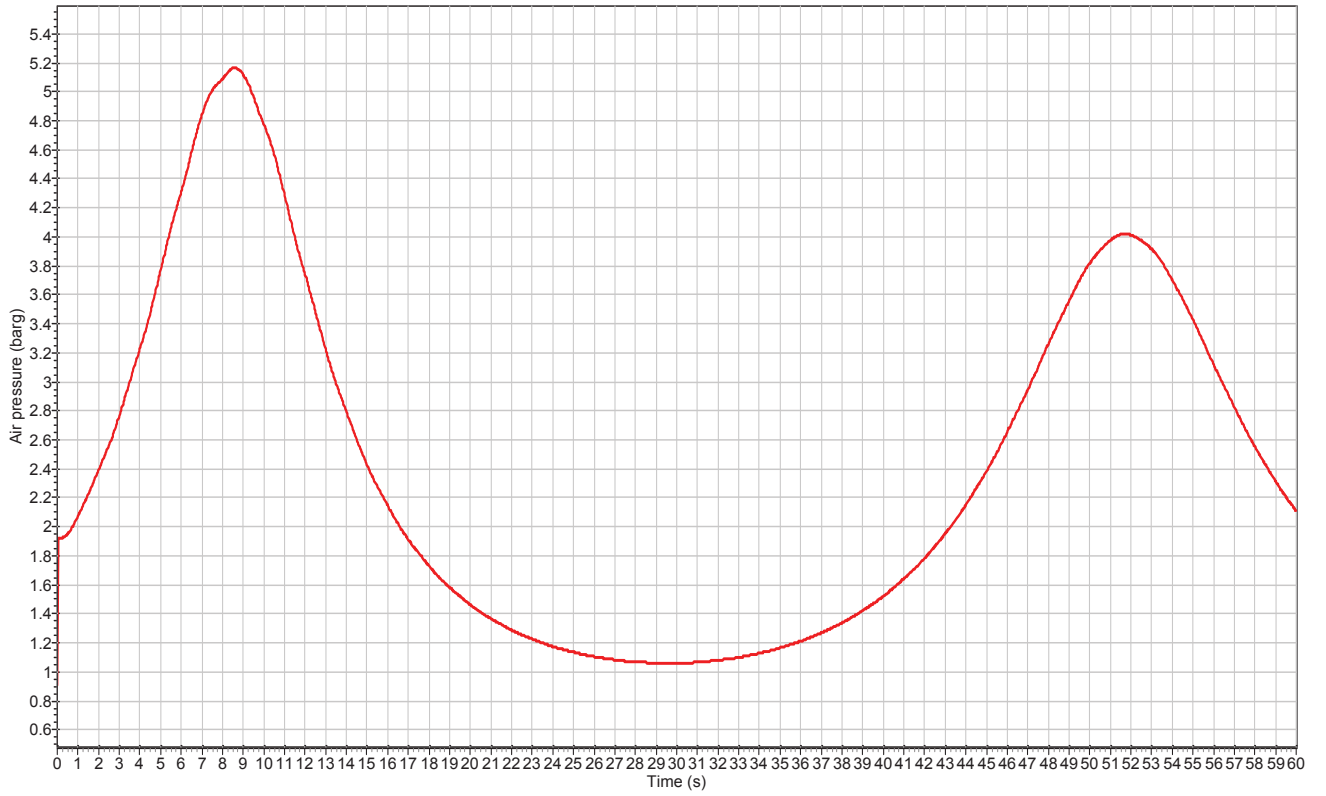
3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



— Fluid level AIRVvn A2 (MARAS IS)

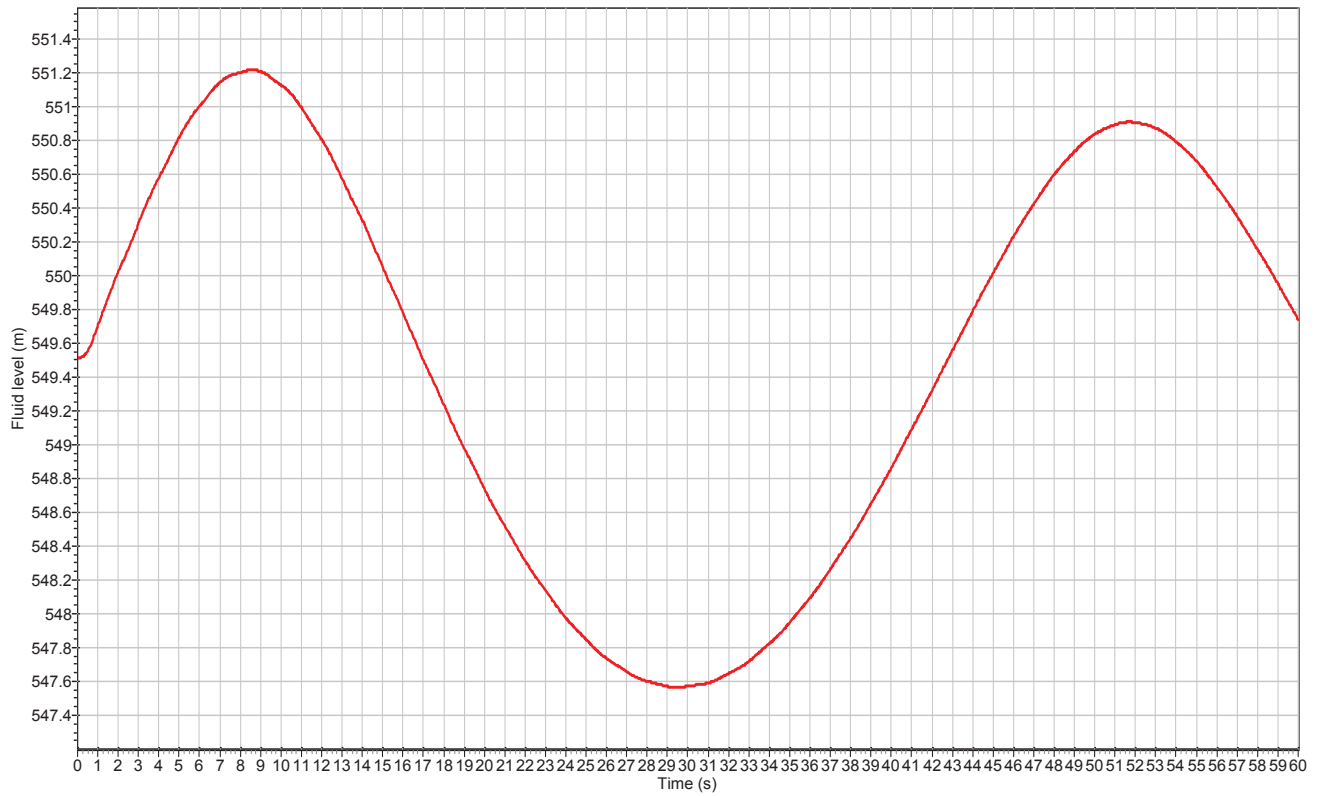
The diagram illustrates a 10 kV power distribution system. It features two main feeders, 2.KADEME Pİ and 1.KADEME Pİ, which are connected to a common busbar system. The system includes several busbars (KBS-10, KBS-15, KBS-16, KBS-17, KBS-18, KBS-19, KBS-20, KBS-21, KBS-22, KBS-23, KBS-24, KBS-25, KBS-26, KBS-27, KBS-28, KBS-29, KBS-30, KBS-31, KBS-32, KBS-33, KBS-34, KBS-35, KBS-36, KBS-37, KBS-38, KBS-39, KBS-40, KBS-41, KBS-42, KBS-43, KBS-44, KBS-45, KBS-46, KBS-47, KBS-48, KBS-49, KBS-50, KBS-51, KBS-52, KBS-53, KBS-54, KBS-55, KBS-56, KBS-57, KBS-58, KBS-59, KBS-60, KBS-61, KBS-62, KBS-63, KBS-64, KBS-65, KBS-66, KBS-67, KBS-68, KBS-69, KBS-70, KBS-71, KBS-72, KBS-73, KBS-74, KBS-75, KBS-76, KBS-77, KBS-78, KBS-79, KBS-80, KBS-81, KBS-82, KBS-83, KBS-84, KBS-85, KBS-86, KBS-87, KBS-88, KBS-89, KBS-90, KBS-91, KBS-92, KBS-93, KBS-94, KBS-95, KBS-96, KBS-97, KBS-98, KBS-99, KBS-100) and breakers (KBS-10, KBS-15, KBS-16, KBS-17, KBS-18, KBS-19, KBS-20, KBS-21, KBS-22, KBS-23, KBS-24, KBS-25, KBS-26, KBS-27, KBS-28, KBS-29, KBS-30, KBS-31, KBS-32, KBS-33, KBS-34, KBS-35, KBS-36, KBS-37, KBS-38, KBS-39, KBS-40, KBS-41, KBS-42, KBS-43, KBS-44, KBS-45, KBS-46, KBS-47, KBS-48, KBS-49, KBS-50, KBS-51, KBS-52, KBS-53, KBS-54, KBS-55, KBS-56, KBS-57, KBS-58, KBS-59, KBS-60, KBS-61, KBS-62, KBS-63, KBS-64, KBS-65, KBS-66, KBS-67, KBS-68, KBS-69, KBS-70, KBS-71, KBS-72, KBS-73, KBS-74, KBS-75, KBS-76, KBS-77, KBS-78, KBS-79, KBS-80, KBS-81, KBS-82, KBS-83, KBS-84, KBS-85, KBS-86, KBS-87, KBS-88, KBS-89, KBS-90, KBS-91, KBS-92, KBS-93, KBS-94, KBS-95, KBS-96, KBS-97, KBS-98, KBS-99, KBS-100). The system also includes transformers (KBS-10, KBS-15, KBS-16, KBS-17, KBS-18, KBS-19, KBS-20, KBS-21, KBS-22, KBS-23, KBS-24, KBS-25, KBS-26, KBS-27, KBS-28, KBS-29, KBS-30, KBS-31, KBS-32, KBS-33, KBS-34, KBS-35, KBS-36, KBS-37, KBS-38, KBS-39, KBS-40, KBS-41, KBS-42, KBS-43, KBS-44, KBS-45, KBS-46, KBS-47, KBS-48, KBS-49, KBS-50, KBS-51, KBS-52, KBS-53, KBS-54, KBS-55, KBS-56, KBS-57, KBS-58, KBS-59, KBS-60, KBS-61, KBS-62, KBS-63, KBS-64, KBS-65, KBS-66, KBS-67, KBS-68, KBS-69, KBS-70, KBS-71, KBS-72, KBS-73, KBS-74, KBS-75, KBS-76, KBS-77, KBS-78, KBS-79, KBS-80, KBS-81, KBS-82, KBS-83, KBS-84, KBS-85, KBS-86, KBS-87, KBS-88, KBS-89, KBS-90, KBS-91, KBS-92, KBS-93, KBS-94, KBS-95, KBS-96, KBS-97, KBS-98, KBS-99, KBS-100) and various loads (KBS-10, KBS-15, KBS-16, KBS-17, KBS-18, KBS-19, KBS-20, KBS-21, KBS-22, KBS-23, KBS-24, KBS-25, KBS-26, KBS-27, KBS-28, KBS-29, KBS-30, KBS-31, KBS-32, KBS-33, KBS-34, KBS-35, KBS-36, KBS-37, KBS-38, KBS-39, KBS-40, KBS-41, KBS-42, KBS-43, KBS-44, KBS-45, KBS-46, KBS-47, KBS-48, KBS-49, KBS-50, KBS-51, KBS-52, KBS-53, KBS-54, KBS-55, KBS-56, KBS-57, KBS-58, KBS-59, KBS-60, KBS-61, KBS-62, KBS-63, KBS-64, KBS-65, KBS-66, KBS-67, KBS-68, KBS-69, KBS-70, KBS-71, KBS-72, KBS-73, KBS-74, KBS-75, KBS-76, KBS-77, KBS-78, KBS-79, KBS-80, KBS-81, KBS-82, KBS-83, KBS-84, KBS-85, KBS-86, KBS-87, KBS-88, KBS-89, KBS-90, KBS-91, KBS-92, KBS-93, KBS-94, KBS-95, KBS-96, KBS-97, KBS-98, KBS-99, KBS-100). The system is designed to provide a reliable and efficient power supply to the various loads connected to it.

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



— Air pressure AIRVva A1 (MARAS IS)

3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17



— Fluid level AIRVva A1 (MARAS IS)

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 11:35:17

Case : 3.1.4 K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17

Title: 3.1.4 K.MARAS 1.KD+2KD-KAZANLI -03 JUL 17

Case description:

=====

3.1.4 K.MARAS 1.KD+2.KD-KAZANLI-03 JUL 17

H-scheme connectivity:

=====

lhs H-node	H-component	rhs H-node
AE.d	AIRVva A1	
AE.c	AIRVva A2	
AE.b	AIRVvn A1	
AE.e	AIRVvn A2	
BF	BOUNDH ARITMA G.	
A	BOUNDH MENZELET BRJ	
L	CHECKV C1	M
AD.c	CHECKV C10	AC.c
R	CHECKV C2	S
W	CHECKV C3	X
AB	CHECKV C4	AC
AO	CHECKV C5	AP
AU	CHECKV C6	AV
AZ	CHECKV C7	BA
AB.a	CHECKV C8	AC.a
AD.b	CHECKV C9	AC.b
G	PIPE 1100 B.	D
□	PIPE 1101	AH
AG	PIPE BASMA BORUSU-1	BD
BD	PIPE BASMA BORUSU-2	BE
BE	PIPE BASMA BORUSU-3	BF
AF.a	PIPE KOL115	AG
AF	PIPE KOL15	AG
A	PIPE Mevcut Boru	B
B	PIPE Yeni Boru	C
C	PIPE Yeni Boru.a	BH
D	PRIGID KOL1	E
T	PRIGID KOL10	H
F	PRIGID KOL11	U
AW	PRIGID KOL110	AK

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

AJ	PRIGID	KOL111	AX
BB	PRIGID	KOL112	AL
AE.a	PRIGID	KOL113	BC
AD.a	PRIGID	KOL114	AF.a
Y	PRIGID	KOL12	I
AE	PRIGID	KOL13	Z
AD	PRIGID	KOL14	AF
AH	PRIGID	KOL16	AI
AI	PRIGID	KOL17	AJ
AJ	PRIGID	KOL18	AE.a
AH	PRIGID	KOL19	AM
E	PRIGID	KOL2	F
AQ	PRIGID	KOL20	AR
AR	PRIGID	KOL21	AK
AK	PRIGID	KOL22	AL
AL	PRIGID	KOL23	AF.a
AI	PRIGID	KOL24	AS
F	PRIGID	KOL3	AE
D	PRIGID	KOL4	J
N	PRIGID	KOL5	O
O	PRIGID	KOL6	H
H	PRIGID	KOL7	I
I	PRIGID	KOL8	AF
E	PRIGID	KOL9	P
AF.b	PRIGID	P-BYP	AD.b
AF.c	PRIGID	P-BYP.a	AD.c
AD.b	PRIGID	P-CON	AE.b
BG	PRIGID	P-CON.a	AE.c
BG.a	PRIGID	P-CON.b	AE.d
AD.c	PRIGID	P-CON.c	AE.e
K	PUMP	P1	L
Q	PUMP	P2	R
V	PUMP	P3	W
AA	PUMP	P4	AB
AN	PUMP	P5	AO
AT	PUMP	P6	AU
AY	PUMP	P7	AZ
AA.a	PUMP	P8	AB.a
AF.c	VALVE	200 BV1	AC.c
AF.b	VALVE	200 BV6	AC.b
BG	VALVE	600 BV1	BH
BG.a	VALVE	600 BV2	BH
AC.c	VALVE	600 BV3	AG
AC.b	VALVE	600 BV5	AG
BH	VALVE	EV1	G
BC	VALVE	EV10	AA.a
J	VALVE	EV2	K
P	VALVE	EV3	Q
U	VALVE	EV4	V
Z	VALVE	EV5	AA
BH	VALVE	EV6	□
AM	VALVE	EV7	AN

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

AS	VALVE	EV8	AT
AX	VALVE	EV9	AY
M	VALVE	SMS 600 BV	N
S	VALVE	SMS 601	T
X	VALVE	SMS 602	Y
AC	VALVE	SMS 603	AD
AP	VALVE	SMS 604	AQ
AV	VALVE	SMS 605	AW
BA	VALVE	SMS 606	BB
AC.a	VALVE	SMS 607	AD.a

H-node heights:
=====

H-node	height [m]
□	544.250
A	550.000
AA	544.250
AA.a	544.250
AB	544.250
AB.a	544.250
AC	544.250
AC.a	544.250
AC.b	544.250
AC.c	544.250
AD	544.250
AD.a	544.250
AD.b	544.250
AD.c	544.250
AE	544.250
AE.a	544.250
AE.b	546.550
AE.c	546.550
AE.d	546.550
AE.e	546.550
AF	544.250
AF.a	544.250
AF.b	544.250
AF.c	544.250
AG	544.250
AH	544.250
AI	544.250
AJ	544.250
AK	544.250
AL	544.250
AM	544.250
AN	544.250
AO	544.250
AP	544.250
AQ	544.250

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

AR	544.250
AS	544.250
AT	544.250
AU	544.250
AV	544.250
AW	544.250
AX	544.250
AY	544.250
AZ	544.250
B	547.800
BA	544.250
BB	544.250
BC	544.250
BD	620.010
BE	630.180
BF	657.850
BG	544.250
BG.a	544.250
BH	544.250
C	546.450
D	544.250
E	544.250
F	544.250
G	544.250
H	544.250
I	544.250
J	544.250
K	544.250
L	544.250
M	544.250
N	544.250
O	544.250
P	544.250
Q	544.250
R	544.250
S	544.250
T	544.250
U	544.250
V	544.250
W	544.250
X	544.250
Y	544.250
Z	544.250

Pipe profiles:

PIPE	1100 B.	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			23.150	544.25

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

PIPE 1101 :

X-distance	Height
[m]	[m]
0.0000	544.25
51.700	544.25

PIPE BASMA BORUSU-1 :

X-distance	Height
[m]	[m]
0.0000	544.25
24.730	544.03
74.190	542.88
241.93	540.47
905.17	521.95
1162.8	536.76
1287.9	541.48
1434.8	542.87
1493.5	545.64
1611.2	556.25
1678.1	560.61
1708.1	561.37
2113.4	563.79
2262.5	564.32
2851.7	568.07
3095.7	594.62
3156.7	598.90
3349.6	601.52
3496.7	608.80
3676.3	620.01

PIPE BASMA BORUSU-2 :

X-distance	Height
[m]	[m]
0.0000	620.01
288.72	613.40
400.36	625.94
466.43	630.18

PIPE BASMA BORUSU-3 :

X-distance	Height
[m]	[m]
0.0000	630.18
256.23	625.62
312.25	627.71
424.29	634.60
1291.3	643.85
1319.4	644.85
1423.5	654.15
1495.1	657.30
1549.4	657.85

PRIGID KOL1 :

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL10 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL11 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL110 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL111 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL112 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL113 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL114 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PIPE KOL115 :

X-distance	Height
[m]	[m]
0.0000	544.25
49.520	544.25

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

PRIGID	KOL12	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25
PRIGID	KOL13	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PRIGID	KOL14	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25
PIPE	KOL15	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			25.380	544.25
PRIGID	KOL16	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL17	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL18	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL19	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PRIGID	KOL2	:		
			X-distance	Height
			[m]	[m]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

0.0000 544.25
4.2500 544.25

PRIGID KOL20 :
X-distance Height
[m] [m]
0.0000 544.25
15.200 544.25

PRIGID KOL21 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL22 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL23 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL24 :
X-distance Height
[m] [m]
0.0000 544.25
7.1000 544.25

PRIGID KOL3 :
X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL4 :
X-distance Height
[m] [m]
0.0000 544.25
7.1000 544.25

PRIGID KOL5 :
X-distance Height
[m] [m]
0.0000 544.25
15.200 544.25

PRIGID KOL6 :

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL7 :

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL8 :

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL9 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PIPE Mevcut Boru :

X-distance	Height
[m]	[m]
0.0000	550.00
527.65	547.80

PRIGID P-BYP :

X-distance	Height
[m]	[m]
0.0000	544.25
4.0000	544.25

PRIGID P-BYP.a :

X-distance	Height
[m]	[m]
0.0000	544.25
4.0000	544.25

PRIGID P-CON :

X-distance	Height
[m]	[m]
0.0000	544.25
8.0000	544.25
8.0000	546.55

PRIGID P-CON.a :

X-distance	Height
[m]	[m]
0.0000	544.25

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

8.0000	544.25
8.0000	546.55

PRIGID P-CON.b :

X-distance [m]	Height [m]
0.0000	544.25
8.0000	544.25
8.0000	546.55

PRIGID P-CON.c :

X-distance [m]	Height [m]
0.0000	544.25
8.0000	544.25
8.0000	546.55

PIPE Yeni Boru :

X-distance [m]	Height [m]
0.0000	547.80
317.35	546.45

PIPE Yeni Boru.a :

X-distance [m]	Height [m]
0.0000	546.45
0.0000	543.45
54.490	544.25

Fluid specifications:

=====

Fluid name	:	water	[-]
density	:	1000.	[kg/m3]
bulk modulus	:	0.2100E+10	[N/m2]
vapour pressure	:	0.1707E-01	[bar.a]
kinematic viscosity	:	0.1000E-05	[m2/s]

Physical constants:

=====

gravitational acceleration	:	9.810	[m/s2]
atmospheric pressure	:	1.014	[bar.a]

Time parameters

=====

time step	:	0.3000E-01	[s]
simulation end time	:	90.00	[s]

H-component input specifications:

=====

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

AIRVva	A1	vert. vented	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Air inlet level	:	546.8	[m]
	Chamber area	:	4.520	[m2]
	Laplace coefficient	:	1.200	[-]
AIRVva	A2	vert. vented	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Air inlet level	:	546.8	[m]
	Chamber area	:	4.520	[m2]
	Laplace coefficient	:	1.200	[-]
AIRVvn	A1	vert.n.-vent	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Chamber area	:	4.520	[m2]
	Air quantity by	:	Air volume	
	Initial fluid level	:		[m]
	Initial air volume	:	13.00	[m3]
	Initial C in P*V=C	:		[kJ]
	Laplace coefficient	:	1.200	[-]
AIRVvn	A2	vert.n.-vent	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Chamber area	:	4.520	[m2]
	Air quantity by	:	Air volume	
	Initial fluid level	:		[m]
	Initial air volume	:	13.00	[m3]
	Initial C in P*V=C	:		[kJ]
	Laplace coefficient	:	1.200	[-]
BOUNDH	ARITMA G.	-	Model name:	
	Comment	:		S: 659.00 m
	Keywords	:		
	Reference Id	:		
	Pressure head at t = 0 [s]	:	662.0	[m]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

BOUNDH	MENZELET BRJ	-	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Pressure head at t = 0 [s]	:	560.0	[m]
CHECKV	C1	delta_p	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Inner diameter	:	600.0	[mm]
	Loss coefficient	:	1.600	[-]
	Delta_p for reopen	:	0.5000E-01	[bar]
	Initial state	:	Open	
CHECKV	C10	delta_p	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Inner diameter	:	600.0	[mm]
	Loss coefficient	:	1.500	[-]
	Delta_p for reopen	:	0.1000	[bar]
	Initial state	:	Closed	
CHECKV	C2	delta_p	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Inner diameter	:	600.0	[mm]
	Loss coefficient	:	1.600	[-]
	Delta_p for reopen	:	0.5000E-01	[bar]
	Initial state	:	Open	
CHECKV	C3	delta_p	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Inner diameter	:	600.0	[mm]
	Loss coefficient	:	1.600	[-]
	Delta_p for reopen	:	0.5000E-01	[bar]
	Initial state	:	Open	
CHECKV	C4	delta_p	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Inner diameter	:	600.0	[mm]
	Loss coefficient	:	1.600	[-]
	Delta_p for reopen	:	0.5000E-01	[bar]
	Initial state	:	Closed	
CHECKV	C5	delta_p	Model name:	

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C6 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C7 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C8 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Closed

CHECKV C9 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.500 [-]
 Delta_p for reopen : 0.1000 [bar]
 Initial state : Closed

PIPE 1100 B. Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 2
 Tee; flow through branch 0.900

PIPE

1101

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer

Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 2
 Tee; flow through branch 0.900

PIPE

BASMA BORUSU-1

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer

Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01 66
 Elbow 11,25 degr; R=1.5D 0.500E-01

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir
Tee; flow through run 0.300
Tee; flow through branch 0.900

PIPE BASMA BORUSU-2 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1692. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 17.50 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number
Diameter
[mm]
Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01 11
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300
Tee; flow through branch 0.900

PIPE BASMA BORUSU-3 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1692. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 17.50 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number
Diameter
[mm]
Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01 17
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300
Tee; flow through branch 0.900

PIPE KOL115 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1100. [mm]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE

KOL15

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE

Mevcut Boru

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1495. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 14.30 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200 1
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PIPE Yeni Boru Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200 1
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE Yeni Boru.a Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL1 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL10 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL11 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	700.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL110	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL111	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	700.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL112	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Calculation mode: Rigid column

Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL113 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	: St		
Calculation mode:	Rigid column		
Inner diameter	:	700.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL114 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	: St		
Calculation mode:	Rigid column		
Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL12	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL13	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	700.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL14	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Material name : St
Calculation mode: Rigid column
Inner diameter : 600.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL16 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900

PRIGID KOL17 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL18	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Rigid column
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL19	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Rigid column
	Inner diameter	:	700.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL2	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL20 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL21 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL22 Pipe_Xi Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 1100. [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL23 Pipe_Xi Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 1100. [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL24 Pipe_Xi Model name:

Comment :

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL3 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900

PRIGID KOL4 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir
[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL5 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL6 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL7 Pipe_Xi Model name:

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL8 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL9 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID

P-BYP

Pipe_Xi

Model name:

Comment :

Keywords :

Reference Id :

Material name :

Calculation mode: Rigid column

Inner diameter : 200.0 [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 4.000 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	2
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	2
STRAINER.....	2.00	

PRIGID

P-BYP.a

Pipe_Xi

Model name:

Comment :

Keywords :

Reference Id :

Material name :

Calculation mode: Rigid column

Inner diameter : 200.0 [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 4.000 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	2
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	2

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir
 STRAINER..... 2.00

PRIGID	P-CON	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:		
	Calculation mode:	Rigid column		
	Inner diameter	:	600.0	[mm]
	Wall roughness	:	0.1500	[mm]
	Wall thickness	:	4.000	[mm]
	Young's modulus	:	0.2100E+12	[N/m2]
	local losses		Loss coef Xi	Number
Diameter				
				[-]
[mm]				
	Elbow 90 degr; R=1.5D		0.200	
	Elbow 45 degr; R=1.5D		0.120	
	Ball valve 100% open		0.250	
	Diffusor 1:4		0.100	2
	Tee; flow through run		0.300	1
	Tee; flow through branch		0.900	
	STRAINER.....		2.00	

PRIGID	P-CON.a	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:		
	Calculation mode:	Rigid column		
	Inner diameter	:	600.0	[mm]
	Wall roughness	:	0.1500	[mm]
	Wall thickness	:	4.000	[mm]
	Young's modulus	:	0.2100E+12	[N/m2]
	local losses		Loss coef Xi	Number
Diameter				
				[-]
[mm]				
	Elbow 90 degr; R=1.5D		0.200	
	Elbow 45 degr; R=1.5D		0.120	
	Ball valve 100% open		0.250	
	Diffusor 1:4		0.100	2
	Tee; flow through run		0.300	1
	Tee; flow through branch		0.900	
	STRAINER.....		2.00	

PRIGID	P-CON.b	Pipe_Xi	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Material name	:		
	Calculation mode:	Rigid column		

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	4.000	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	2
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	
STRAINER.....	2.00	

PRIGID P-CON.c Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name :
Calculation mode: Rigid column

Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	4.000	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	2
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	
STRAINER.....	2.00	

PUMP P1 Model name:

Comment :
Keywords :
Reference Id : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

600.00 120.00
655.00 110.00

QHE_table : Table
Discharge Efficiency
[l/s] [%]
0.0000 0.0000
250.00 74.000
350.00 82.000
390.00 84.000
500.00 84.500
565.00 84.000
600.00 82.000
655.00 78.000

Suter : Table
Suter : Table
Rated speed : 1450. [rpm]
Q in best point of eff. : [l/s]
H in best point of eff. : [m]
T in best point of eff. : [kNm]
Initial setting : Discharge
Initial speed : [rpm]
Initial suction head : [m]
Initial pressure head : [m]
Initial discharge : 500.0 [l/s]
Initial relative frequency : [%]
Speed-Torque char. of motor : Table
Polar moment of inertia : 30.00 [kgm2]
Drive type : Trip
Trip time : 0.000 [s]
Action table speed : Table
Action table motorfreq. : Table
Minimum speed for tripping : 20.00 [rpm]
Minimum rel.freq. for tripping: [%]
Required speed : [rpm]
Minimum speed : [rpm]
Maximum speed : [rpm]
Maximum power : [kW]
Level ON : [m]
Level OFF : [m]
Start time (0 to max) : [s]
Stop time (max to 0) : [s]

PUMP P2 Model name:

Comment :
Keywords :
Reference Id : KSB Omega 300-700 A
Characteristic type : QHE
QHE_table : Table

Discharge Pump head
[l/s] [m]
0.0000 170.00
250.00 159.60

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table	:	Table	
		Discharge	Efficiency
		[l/s]	[%]
		0.0000	0.0000
		250.00	74.000
		350.00	82.000
		390.00	84.000
		500.00	84.500
		565.00	84.000
		600.00	82.000
		655.00	78.000

Suter	:	Table	
Suter	:	Table	
Rated speed	:	1450.	[rpm]
Q in best point of eff.	:		[l/s]
H in best point of eff.	:		[m]
T in best point of eff.	:		[kNm]
Initial setting	:	Discharge	
Initial speed	:		[rpm]
Initial suction head	:		[m]
Initial pressure head	:		[m]
Initial discharge	:	500.0	[l/s]
Initial relative frequency	:		[%]
Speed-Torque char. of motor	:	Table	
Polar moment of inertia	:	30.00	[kgm2]
Drive type	:	Trip	
Trip time	:	0.000	[s]
Action table speed	:	Table	
Action table motorfreq.	:	Table	
Minimum speed for tripping	:	20.00	[rpm]
Minimum rel.freq. for tripping:	:		[%]
Required speed	:		[rpm]
Minimum speed	:		[rpm]
Maximum speed	:		[rpm]
Maximum power	:		[kW]
Level ON	:		[m]
Level OFF	:		[m]
Start time (0 to max)	:		[s]
Stop time (max to 0)	:		[s]

PUMP	P3	Model name:
	Comment	:
	Keywords	:
	Reference Id	: KSB Omega 300-700 A
	Characteristic type	: QHE
	QHE_table	: Table

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table	:	Table	
		Discharge	Efficiency
		[l/s]	[%]
		0.0000	0.0000
		250.00	74.000
		350.00	82.000
		390.00	84.000
		500.00	84.500
		565.00	84.000
		600.00	82.000
		655.00	78.000

Suter	:	Table	
Suter	:	Table	
Rated speed	:	1450.	[rpm]
Q in best point of eff.	:		[l/s]
H in best point of eff.	:		[m]
T in best point of eff.	:		[kNm]
Initial setting	:	Discharge	
Initial speed	:		[rpm]
Initial suction head	:		[m]
Initial pressure head	:		[m]
Initial discharge	:	500.0	[l/s]
Initial relative frequency	:		[%]
Speed-Torque char. of motor	:	Table	
Polar moment of inertia	:	30.00	[kgm2]
Drive type	:	Trip	
Trip time	:	0.000	[s]
Action table speed	:	Table	
Action table motorfreq.	:	Table	
Minimum speed for tripping	:	20.00	[rpm]
Minimum rel.freq. for tripping:	:		[%]
Required speed	:		[rpm]
Minimum speed	:		[rpm]
Maximum speed	:		[rpm]
Maximum power	:		[kW]
Level ON	:		[m]
Level OFF	:		[m]
Start time (0 to max)	:		[s]
Stop time (max to 0)	:		[s]

PUMP P4 Model name:
Comment :

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Keywords :

Reference Id : KSB Omega 300-700 A

Characteristic type : QHE

QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table

Suter : Table

Rated speed : 1450. [rpm]

Q in best point of eff. : [l/s]

H in best point of eff. : [m]

T in best point of eff. : [kNm]

Initial setting : Speed

Initial speed : 0.000 [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

Trip time : 0.000 [s]

Action table speed : Table

Action table motorfreq. : Table

Minimum speed for tripping : 20.00 [rpm]

Minimum rel.freq. for tripping: [%]

Required speed : [rpm]

Minimum speed : [rpm]

Maximum speed : [rpm]

Maximum power : [kW]

Level ON : [m]

Level OFF : [m]

Start time (0 to max) : [s]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir
 Stop time (max to 0) : [s]

PUMP

P5

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table

Suter : Table

Rated speed : 1450. [rpm]

Q in best point of eff. : [l/s]

H in best point of eff. : [m]

T in best point of eff. : [kNm]

Initial setting : Discharge

Initial speed : [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

Trip time : 0.000 [s]

Action table speed : Table

Action table motorfreq. : Table

Minimum speed for tripping : 20.00 [rpm]

Minimum rel.freq. for tripping: [%]

Required speed : [rpm]

Minimum speed : [rpm]

Maximum speed : [rpm]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P6

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table

: Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Discharge
 Initial speed : [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P7

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table

Suter : Table

Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]

Initial setting : Discharge

Initial speed : [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P8

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Speed
 Initial speed : 0.000 [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Initial relative frequency : [%]
Speed-Torque char. of motor : Table
Polar moment of inertia : 30.00 [kgm2]
Drive type : Trip
Trip time : 0.000 [s]
Action table speed : Table
Action table motorfreq. : Table
Minimum speed for tripping : 20.00 [rpm]
Minimum rel.freq. for tripping: [%]
Required speed : [rpm]
Minimum speed : [rpm]
Maximum speed : [rpm]
Maximum power : [kW]
Level ON : [m]
Level OFF : [m]
Start time (0 to max) : [s]
Stop time (max to 0) : [s]

VALVE 200 BV1 Universal Model name: SMS 700 BV

Comment :
Keywords :
Reference Id :

Characteristic type : Standard
Standard type : Gate
Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.800	499.80
24.300	2408.8
57.900	7840.0
77.800	16125.
84.400	19600.
100.00	29380.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

		100.00	0.23500
Inner diameter	:	150.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	50.00	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]
Initial discharge	:		[l/s]
Initial upstream pressure	:		[barg]
Initial downstream pressure	:		[barg]
Check cavitation	:	No	
Cavitation table	:	Table	

VALVE 200 BV6 Universal Model name: SMS 700 BV

Comment :
Keywords :
Reference Id :

Characteristic type : Standard
Standard type : Gate
Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	499.80
24.300	2408.8
57.900	7840.0
77.800	16125.
84.400	19600.
100.00	29380.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter	:	150.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	50.00	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE 600 BV1 Universal Model name: SMS 600 BV

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Gate
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

VALVE 600 BV2 Universal Model name: SMS 600 BV

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Gate

Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE 600 BV3 Universal Model name: SMS 600 BV

Comment :

Keywords :

Reference Id :

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Characteristic type : Kv
Standard type : Gate
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE 600 BV5 Universal Model name: SMS 600 BV
Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Gate
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV1 Universal Model name:
Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
9.1600	2089.7
29.600	3678.4
49.300	14351.
66.600	32029.

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

69.400	36300.
84.500	60500.
100.00	96800.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 1100. [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV10 Universal Model name:

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Butterfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV2 Universal Model name:
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV3 Universal Model name:
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter	:	700.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	100.0	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]
Initial discharge	:		[l/s]
Initial upstream pressure	:		[barg]
Initial downstream pressure	:		[barg]
Check cavitation	:	No	
Cavitation table	:	Table	

VALVE EV4 Universal Model name:

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Butterfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

	97.000	0.40853
	100.00	0.40000
Inner diameter	: 700.0	[mm]
Initial setting	: Position	
Initial position (open)	: 100.0	[%]
Initial upstream head	:	[m]
Initial downstream head	:	[m]
Initial discharge	:	[l/s]
Initial upstream pressure	:	[barg]
Initial downstream pressure	:	[barg]
Check cavitation	: No	
Cavitation table	: Table	

VALVE EV5 Universal Model name:

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter	: 700.0	[mm]
Initial setting	: Position	
Initial position (open)	: 100.0	[%]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE EV6 Universal Model name:

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar) ^{1/2}]
0.0000	0.0000
9.1600	2089.7
29.600	3678.4
49.300	14351.
66.600	32029.
69.400	36300.
84.500	60500.
100.00	96800.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 1100. [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Check cavitation : No
Cavitation table : Table

VALVE EV7 Universal Model name:

Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV8 Universal Model name:
Comment :

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV9 Universal Model name:
Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 600 BV Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter	:	600.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	100.0	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]
Initial discharge	:		[l/s]
Initial upstream pressure	:		[barg]
Initial downstream pressure	:		[barg]
Check cavitation	:	No	
Cavitation table	:	Table	

VALVE SMS 601 Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open [%]	Kv [m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 602 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 603 Universal Model name: SMS 600
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 604 Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter	:	600.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	100.0	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]
Initial discharge	:		[l/s]
Initial upstream pressure	:		[barg]
Initial downstream pressure	:		[barg]
Check cavitation	:	No	
Cavitation table	:	Table	

VALVE SMS 605 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter	:	600.0	[mm]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 606 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Butterfly
Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 607 Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

Calculated pipe data:

=====

PIPE		length [m]	C_calc [m/s]	C_adapt [m/s]	N_elem [-]
PIPE	1100 B.	23.150	1025.	772.	1
PIPE	1101	51.700	1025.	862.	2
PIPE	BASMA BORUSU-1	3679.934	1033.	1031.	119
PIPE	BASMA BORUSU-2	467.344	1033.	1039.	15
PIPE	BASMA BORUSU-3	1550.225	1033.	1033.	50
PRIGID	KOL1	4.250	used as rigid column		
PRIGID	KOL10	15.200	used as rigid column		
PRIGID	KOL11	7.100	used as rigid column		
PRIGID	KOL110	15.200	used as rigid column		
PRIGID	KOL111	7.100	used as rigid column		
PRIGID	KOL112	15.200	used as rigid column		
PRIGID	KOL113	7.100	used as rigid column		
PRIGID	KOL114	15.200	used as rigid column		
PIPE	KOL115	49.520	1025.	825.	2
PRIGID	KOL12	15.200	used as rigid column		
PRIGID	KOL13	7.100	used as rigid column		
PRIGID	KOL14	15.200	used as rigid column		
PIPE	KOL15	25.380	1025.	846.	1
PRIGID	KOL16	4.250	used as rigid column		
PRIGID	KOL17	4.250	used as rigid column		
PRIGID	KOL18	4.250	used as rigid column		
PRIGID	KOL19	7.100	used as rigid column		
PRIGID	KOL2	4.250	used as rigid column		
PRIGID	KOL20	15.200	used as rigid column		
PRIGID	KOL21	4.250	used as rigid column		
PRIGID	KOL22	4.250	used as rigid column		
PRIGID	KOL23	4.250	used as rigid column		
PRIGID	KOL24	7.100	used as rigid column		
PRIGID	KOL3	4.250	used as rigid column		
PRIGID	KOL4	7.100	used as rigid column		
PRIGID	KOL5	15.200	used as rigid column		
PRIGID	KOL6	4.250	used as rigid column		
PRIGID	KOL7	4.250	used as rigid column		
PRIGID	KOL8	4.250	used as rigid column		
PRIGID	KOL9	7.100	used as rigid column		
PIPE	Mevcut Boru	527.655	1013.	1035.	17
PRIGID	P-BYP	4.000	used as rigid column		
PRIGID	P-BYP.a	4.000	used as rigid column		
PRIGID	P-CON	10.300	used as rigid column		
PRIGID	P-CON.a	10.300	used as rigid column		
PRIGID	P-CON.b	10.300	used as rigid column		
PRIGID	P-CON.c	10.300	used as rigid column		
PIPE	Yeni Boru	317.353	1033.	1058.	10
PIPE	Yeni Boru.a	57.496	1033.	958.	2

Active H-components:

3.1.4 INPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wir

=====

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 01:23:30

Case : 3.1.4 K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17

Title: 3.1.4 K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17

Case description:

=====

3.1.4 K.MARAS 1.KD+2.KD-KAZANLI-03 JUL 17

Steady state results:

Pipes:

Name v	length [m]	lambda [-]	wall rough. [mm]	c_calc [m/s]	c_adapt [m/s]	N_elem [-]	Q [l/s]
1100 B. 1.578	23.15	0.0420	0.150	1024.70	771.67	1	1500.000
1101 1.578	51.70	0.0262	0.150	1024.70	861.67	2	1500.000
BASMA BORUSU-1 1.334	3679.93	0.0149	0.150	1033.29	1030.79	119	3000.000
BASMA BORUSU-2 1.334	467.34	0.0157	0.150	1033.29	1038.54	15	3000.000
BASMA BORUSU-3 1.334	1550.22	0.0140	0.150	1033.29	1033.48	50	3000.000
KOL115 1.578	49.52	0.0201	0.150	1024.70	825.33	2	1500.000
KOL15 1.578	25.38	0.0265	0.150	1024.70	846.00	1	1500.000
Mevcut Boru 1.709	527.65	0.0170	0.150	1013.25	1034.62	17	3000.000
Yeni Boru 1.334	317.35	0.0158	0.150	1033.29	1057.84	10	3000.000
Yeni Boru.a 1.334	57.50	0.0249	0.150	1033.29	958.26	2	3000.000

Discharges and velocities through H-components:

H-component	discharge [l/s]	velocity [m/s]

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

AIRVva	A1	0.000	
AIRVva	A2	0.000	
AIRVvn	A1	0.000	
AIRVvn	A2	0.000	
BOUNDH	ARITMA G.	-3000.000	
BOUNDH	MENZELET BRJ	3000.000	
CHECKV	C1	500.000	1.768
CHECKV	C10	0.000	
CHECKV	C2	500.000	1.768
CHECKV	C3	500.000	1.768
CHECKV	C4	0.000	
CHECKV	C5	500.000	1.768
CHECKV	C6	500.000	1.768
CHECKV	C7	500.000	1.768
CHECKV	C8	0.000	
CHECKV	C9	0.000	
PRIGID	KOL1	1000.000	1.052
PRIGID	KOL10	500.000	1.768
PRIGID	KOL11	500.000	1.299
PRIGID	KOL110	500.000	1.768
PRIGID	KOL111	500.000	1.299
PRIGID	KOL112	500.000	1.768
PRIGID	KOL113	0.000	
PRIGID	KOL114	0.000	
PRIGID	KOL12	500.000	1.768
PRIGID	KOL13	0.000	
PRIGID	KOL14	0.000	
PRIGID	KOL16	1000.000	1.052
PRIGID	KOL17	500.000	0.526
PRIGID	KOL18	0.000	
PRIGID	KOL19	500.000	1.299
PRIGID	KOL2	500.000	0.526
PRIGID	KOL20	500.000	1.768
PRIGID	KOL21	500.000	0.526
PRIGID	KOL22	1000.000	1.052
PRIGID	KOL23	1500.000	1.578
PRIGID	KOL24	500.000	1.299
PRIGID	KOL3	0.000	
PRIGID	KOL4	500.000	1.299
PRIGID	KOL5	500.000	1.768
PRIGID	KOL6	500.000	0.526
PRIGID	KOL7	1000.000	1.052
PRIGID	KOL8	1500.000	1.578
PRIGID	KOL9	500.000	1.299
PRIGID	P-BYP	0.000	
PRIGID	P-BYP.a	0.000	
PRIGID	P-CON	0.000	
PRIGID	P-CON.a	0.000	
PRIGID	P-CON.b	0.000	
PRIGID	P-CON.c	0.000	
PUMP	P1	500.000	
PUMP	P2	500.000	

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

PUMP	P3	500.000	
PUMP	P4	0.000	
PUMP	P5	500.000	
PUMP	P6	500.000	
PUMP	P7	500.000	
PUMP	P8	0.000	
VALVE	200 BV1	0.000	
VALVE	200 BV6	0.000	
VALVE	600 BV1	0.000	
VALVE	600 BV2	0.000	
VALVE	600 BV3	0.000	
VALVE	600 BV5	0.000	
VALVE	EV1	1500.000	1.578
VALVE	EV10	0.000	
VALVE	EV2	500.000	1.299
VALVE	EV3	500.000	1.299
VALVE	EV4	500.000	1.299
VALVE	EV5	0.000	
VALVE	EV6	1500.000	1.578
VALVE	EV7	500.000	1.299
VALVE	EV8	500.000	1.299
VALVE	EV9	500.000	1.299
VALVE	SMS 600 BV	500.000	1.768
VALVE	SMS 601	500.000	1.768
VALVE	SMS 602	500.000	1.768
VALVE	SMS 603	0.000	
VALVE	SMS 604	500.000	1.768
VALVE	SMS 605	500.000	1.768
VALVE	SMS 606	500.000	1.768
VALVE	SMS 607	0.000	

Pressures and heads in H-nodes:

H-node	pressure [barg]	head [m]
□	1.42	558.731
A	0.98	560.000
AA	1.40	558.594
AA.a	1.40	558.550
AB	1.40	558.594
AB.a	1.40	558.550
AC	12.00	666.583
AC.a	12.00	666.620
AC.b	11.99	666.505
AC.c	11.99	666.505
AD	12.00	666.583
AD.a	12.00	666.620
AD.b	11.99	666.505
AD.c	11.99	666.505
AE	1.40	558.594
AE.a	1.40	558.550

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

AE.b	11.76	666.505
AE.c	1.19	558.763
AE.d	1.19	558.763
AE.e	11.76	666.505
AF	12.00	666.583
AF.a	12.00	666.620
AF.b	11.99	666.505
AF.c	11.99	666.505
AG	11.99	666.505
AH	1.40	558.575
AI	1.40	558.555
AJ	1.40	558.550
AK	12.01	666.685
AL	12.00	666.665
AM	1.39	558.438
AN	1.38	558.407
AO	12.07	667.304
AP	12.04	667.049
AQ	12.04	666.981
AR	12.01	666.690
AS	1.39	558.418
AT	1.38	558.387
AU	12.07	667.299
AV	12.04	667.044
AW	12.03	666.976
AX	1.38	558.413
AY	1.38	558.382
AZ	12.06	667.279
B	1.10	559.109
BA	12.04	667.024
BB	12.03	666.956
BC	1.40	558.550
BD	4.27	663.557
BE	3.23	663.164
BF	0.40	662.000
BG	1.42	558.763
BG.a	1.42	558.763
BH	1.42	558.763
C	1.21	558.840
D	1.41	558.619
E	1.40	558.599
F	1.40	558.594
G	1.42	558.731
H	12.00	666.648
I	12.00	666.628
J	1.39	558.482
K	1.39	558.451
L	12.06	667.267
M	12.04	667.012
N	12.03	666.943
O	12.00	666.653
P	1.39	558.462

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

Q	1.39	558.431
R	12.06	667.262
S	12.04	667.007
T	12.03	666.938
U	1.39	558.457
V	1.39	558.426
W	12.06	667.242
X	12.04	666.987
Y	12.03	666.918
Z	1.40	558.594

Additional H-component output:

AIRVva	A1	Fluid level	549.516	[m]
		Air pressure	0.907	[barg]
AIRVva	A2	Fluid level	549.516	[m]
		Air pressure	0.907	[barg]
AIRVvn	A1	Fluid level	549.674	[m]
		Air pressure	11.461	[barg]
		Air volume	13.000	[m3]
AIRVvn	A2	Fluid level	549.674	[m]
		Air pressure	11.461	[barg]
		Air volume	13.000	[m3]
PUMP	P1	Pump speed	1336.344	[rpm]
		Fluid torque	4.523	[kNm]
		Motor torque	4.523	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.327	[%]
		Power	632.941	[kW]
		Energy	0.000	[kJ]
PUMP	P2	Pump speed	1336.415	[rpm]
		Fluid torque	4.523	[kNm]
		Motor torque	4.523	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.327	[%]
		Power	633.025	[kW]
		Energy	0.000	[kJ]
PUMP	P3	Pump speed	1336.344	[rpm]
		Fluid torque	4.523	[kNm]
		Motor torque	4.523	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.327	[%]
		Power	632.941	[kW]
		Energy	0.000	[kJ]
PUMP	P4	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	84.327	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
PUMP	P5	Pump speed	1336.733	[rpm]

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

		Fluid torque	4.525	[kNm]
		Motor torque	4.525	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.329	[%]
		Power	633.404	[kW]
		Energy	0.000	[kJ]
PUMP	P6	Pump speed	1336.804	[rpm]
		Fluid torque	4.525	[kNm]
		Motor torque	4.525	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.329	[%]
		Power	633.489	[kW]
		Energy	0.000	[kJ]
PUMP	P7	Pump speed	1336.733	[rpm]
		Fluid torque	4.525	[kNm]
		Motor torque	4.525	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	84.329	[%]
		Power	633.404	[kW]
		Energy	0.000	[kJ]
PUMP	P8	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	84.329	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
VALVE	200 BV1	Valve position (open)	50.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	200 BV6	Valve position (open)	50.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV1	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV2	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV3	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV1	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV10	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV2	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV3	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV4	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV6	Valve position (open)	100.000	[%]

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

		Pressure ratio Xf	0.001	[-]
VALVE	EV7	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV8	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	EV9	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 600 BV	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 601	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 602	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 603	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	SMS 604	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 605	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 606	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 607	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]

Extreme values in pipes:

Head:

Pipe location	minimum	time	location	maximum	time	
	[m]	[s]	[m]	[m]	[s]	[m]
1100 B. 23.15	547.204	28.410	23.15	594.556	8.070	
1101 51.70	546.083	29.670	51.70	596.714	8.010	
BASMA BORUSU-1 0.00	591.651	11.910	92.77	693.477	27.030	
BASMA BORUSU-2 0.00	623.749	18.240	0.00	684.485	29.430	
BASMA BORUSU-3 0.00	628.820	18.090	0.00	681.234	29.220	
KOL115 0.00	590.217	12.030	0.00	693.490	27.120	
KOL15 0.00	592.354	11.910	0.00	693.494	27.030	
Mevcut Boru 527.65	547.034	1.680	155.19	589.630	8.010	
Yeni Boru 222.15	546.500	26.760	190.41	596.038	8.010	
Yeni Boru.a 0.00	547.009	28.620	0.00	595.191	8.130	

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

Pressure:

Pipe location [m]	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]
1100 B. 23.15	0.290	28.410	23.15	4.935	8.070
1101 51.70	0.180	29.670	51.70	5.147	8.010
BASMA BORUSU-1 896.79	0.367	18.240	3679.93	16.669	27.450
BASMA BORUSU-2 280.41	-0.133	18.090	467.34	6.810	29.400
BASMA BORUSU-3 248.04	-0.133	18.090	0.00	5.192	30.000
KOL115 0.00	4.509	12.030	0.00	14.640	27.120
KOL15 0.00	4.719	11.910	0.00	14.641	27.030
Mevcut Boru 527.65	-0.227	1.680	155.19	4.104	8.010
Yeni Boru 222.15	-0.061	26.700	126.94	4.825	8.010
Yeni Boru.a 28.75	0.055	28.620	0.00	5.037	8.130

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
1101	0.000	0.000	0.00
BASMA BORUSU-1	0.000	0.000	0.00
BASMA BORUSU-2	0.000	0.000	0.00
BASMA BORUSU-3	0.000	0.000	0.00
KOL115	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00
Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

Extreme discharges through H-components:

H-component	minimum [l/s]	time [s]	maximum [l/s]	time [s]
AIRVva A1	-1521.584	0.900	1305.802	16.200
AIRVva A2	-1521.584	0.900	1305.802	16.200

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

AIRVvn	A1	-402.627	26.670	1424.724	0.870
AIRVvn	A2	-402.627	26.670	1424.724	0.870
BOUNDH	ARITMA G.	-3000.028	2.160	1496.101	21.360
BOUNDH	MENZELET BRJ	-2644.056	15.330	3018.752	1.830
CHECKV	C1	0.000	0.630	500.000	0.000
CHECKV	C10	0.000	0.000	1385.893	0.870
CHECKV	C2	0.000	0.660	500.000	0.000
CHECKV	C3	0.000	0.630	500.000	0.000
CHECKV	C4	0.000	0.060	0.000	0.390
CHECKV	C5	0.000	0.810	500.000	0.000
CHECKV	C6	0.000	0.780	500.000	0.000
CHECKV	C7	0.000	0.780	500.000	0.000
CHECKV	C8	0.000	0.330	0.000	0.030
CHECKV	C9	0.000	41.490	1385.893	0.870
PRIGID	KOL1	0.000	1.410	1000.000	0.000
PRIGID	KOL10	0.000	0.660	500.000	0.000
PRIGID	KOL11	0.000	0.750	500.000	0.000
PRIGID	KOL110	0.000	0.780	500.000	0.000
PRIGID	KOL111	0.000	0.870	500.000	0.000
PRIGID	KOL112	0.000	0.780	500.000	0.000
PRIGID	KOL113	0.000	0.330	0.000	0.030
PRIGID	KOL114	0.000	0.000	0.000	0.000
PRIGID	KOL12	0.000	0.630	500.000	0.000
PRIGID	KOL13	0.000	0.060	0.000	0.030
PRIGID	KOL14	0.000	0.000	0.000	0.000
PRIGID	KOL16	0.000	5.760	1000.000	0.000
PRIGID	KOL17	0.000	0.780	500.000	0.000
PRIGID	KOL18	0.000	0.360	0.000	0.030
PRIGID	KOL19	0.000	10.020	500.000	0.000
PRIGID	KOL2	0.000	0.630	500.000	0.000
PRIGID	KOL20	0.000	0.780	500.000	0.000
PRIGID	KOL21	0.000	0.780	500.000	0.000
PRIGID	KOL22	0.000	0.990	1000.000	0.000
PRIGID	KOL23	0.000	0.810	1500.000	0.000
PRIGID	KOL24	0.000	1.800	500.000	0.000
PRIGID	KOL3	0.000	0.060	0.000	0.030
PRIGID	KOL4	0.000	5.220	500.000	0.000
PRIGID	KOL5	0.000	0.660	500.000	0.000
PRIGID	KOL6	0.000	0.660	500.000	0.000
PRIGID	KOL7	0.000	0.870	1000.000	0.000
PRIGID	KOL8	0.000	14.310	1500.000	0.000
PRIGID	KOL9	0.000	3.150	500.000	0.000
PRIGID	P-BYP	-52.057	1.500	402.627	26.670
PRIGID	P-BYP.a	-52.057	1.500	402.627	26.670
PRIGID	P-CON	-1424.724	0.870	402.627	26.670
PRIGID	P-CON.a	-1305.802	16.200	1521.584	0.900
PRIGID	P-CON.b	-1305.802	16.200	1521.584	0.900
PRIGID	P-CON.c	-1424.724	0.870	402.627	26.670
PUMP	P1	0.000	0.630	500.000	0.000
PUMP	P2	0.000	0.660	500.000	0.000
PUMP	P3	0.000	0.630	500.000	0.000
PUMP	P4	0.000	0.000	0.000	0.000

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

PUMP	P5	0.000	0.810	500.000	0.000
PUMP	P6	0.000	0.780	500.000	0.000
PUMP	P7	0.000	0.780	500.000	0.000
PUMP	P8	0.000	0.000	0.000	0.000
VALVE	200 BV1	-402.627	26.670	52.057	1.500
VALVE	200 BV6	-402.627	26.670	52.057	1.500
VALVE	600 BV1	-1521.584	0.900	1305.802	16.200
VALVE	600 BV2	-1521.584	0.900	1305.802	16.200
VALVE	600 BV3	-402.627	26.670	1424.724	0.870
VALVE	600 BV5	-402.627	26.670	1424.724	0.870
VALVE	EV1	-81.997	0.660	1500.000	0.000
VALVE	EV10	0.000	0.330	0.000	0.030
VALVE	EV2	0.000	0.630	500.000	0.000
VALVE	EV3	0.000	0.660	500.000	0.000
VALVE	EV4	0.000	0.630	500.000	0.000
VALVE	EV5	0.000	0.060	0.000	0.390
VALVE	EV6	-122.961	0.840	1509.266	0.060
VALVE	EV7	0.000	0.810	500.000	0.000
VALVE	EV8	0.000	0.780	500.000	0.000
VALVE	EV9	0.000	0.780	500.000	0.000
VALVE	SMS 600 BV	0.000	0.660	500.000	0.000
VALVE	SMS 601	0.000	0.660	500.000	0.000
VALVE	SMS 602	0.000	0.630	500.000	0.000
VALVE	SMS 603	0.000	0.060	0.000	0.390
VALVE	SMS 604	0.000	0.780	500.000	0.000
VALVE	SMS 605	0.000	0.780	500.000	0.000
VALVE	SMS 606	0.000	0.780	500.000	0.000
VALVE	SMS 607	0.000	0.330	0.000	0.030

Extreme pressure heads in H-nodes:

H-node	minimum [m]	time [s]	maximum [m]	time [s]
□	547.667	28.650	593.489	8.040
A	560.000	0.000	560.000	0.000
AA	547.204	28.410	594.556	8.070
AA.a	546.083	29.670	596.714	8.010
AB	547.204	28.410	594.556	8.070
AB.a	546.083	29.670	596.714	8.010
AC	592.354	11.910	693.494	27.030
AC.a	590.217	12.030	693.490	27.120
AC.b	594.202	11.940	693.433	27.030
AC.c	594.202	11.940	693.433	27.030
AD	592.354	11.910	693.494	27.030
AD.a	590.217	12.030	693.490	27.120
AD.b	594.465	11.940	666.505	0.000
AD.c	594.465	11.940	666.505	0.000
AE	547.204	28.410	594.556	8.070
AE.a	546.083	29.670	596.714	8.010
AE.b	594.669	14.760	666.505	0.000
AE.c	548.027	29.370	593.531	8.580

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

AE.d	548.027	29.370	593.531	8.580
AE.e	594.669	14.760	666.505	0.000
AF	592.354	11.910	693.494	27.030
AF.a	590.217	12.030	693.490	27.120
AF.b	594.437	11.940	666.505	0.000
AF.c	594.437	11.940	666.505	0.000
AG	594.120	11.940	693.477	27.030
AH	546.083	29.670	596.714	8.010
AI	546.083	29.670	596.714	8.010
AJ	546.083	29.670	596.714	8.010
AK	590.217	12.030	693.490	27.120
AL	590.217	12.030	693.490	27.120
AM	546.083	29.670	596.714	8.010
AN	546.083	29.670	596.714	8.010
AO	546.345	29.670	667.304	0.000
AP	590.217	12.030	693.490	27.120
AQ	590.217	12.030	693.490	27.120
AR	590.217	12.030	693.490	27.120
AS	546.083	29.670	596.714	8.010
AT	546.083	29.670	596.714	8.010
AU	546.345	29.670	667.299	0.000
AV	590.217	12.030	693.490	27.120
AW	590.217	12.030	693.490	27.120
AX	546.083	29.670	596.714	8.010
AY	546.083	29.670	596.714	8.010
AZ	546.345	29.670	667.279	0.000
B	547.582	24.840	589.630	8.010
BA	590.217	12.030	693.490	27.120
BB	590.217	12.030	693.490	27.120
BC	546.083	29.670	596.714	8.010
BD	623.749	18.240	684.485	29.430
BE	628.820	18.090	681.234	29.220
BF	662.000	0.000	662.000	0.000
BG	547.673	28.650	593.481	8.040
BG.a	547.673	28.650	593.481	8.040
BH	547.667	28.650	593.489	8.040
C	547.009	28.620	595.191	8.130
D	547.204	28.410	594.556	8.070
E	547.204	28.410	594.556	8.070
F	547.204	28.410	594.556	8.070
G	547.667	28.650	593.489	8.040
H	592.354	11.910	693.494	27.030
I	592.354	11.910	693.494	27.030
J	547.204	28.410	594.556	8.070
K	547.204	28.410	594.556	8.070
L	547.489	28.410	667.267	0.000
M	592.354	11.910	693.494	27.030
N	592.354	11.910	693.494	27.030
O	592.354	11.910	693.494	27.030
P	547.204	28.410	594.556	8.070
Q	547.204	28.410	594.556	8.070
R	547.489	28.410	667.262	0.000

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

S	592.354	11.910	693.494	27.030
T	592.354	11.910	693.494	27.030
U	547.204	28.410	594.556	8.070
V	547.204	28.410	594.556	8.070
W	547.489	28.410	667.242	0.000
X	592.354	11.910	693.494	27.030
Y	592.354	11.910	693.494	27.030
Z	547.204	28.410	594.556	8.070

Extreme pressures in H-nodes:

H-node	minimum [barg]	time [s]	maximum [barg]	time [s]
□	0.335	28.650	4.830	8.040
A	0.981	0.000	0.981	0.000
AA	0.290	28.410	4.935	8.070
AA.a	0.180	29.670	5.147	8.010
AB	0.290	28.410	4.935	8.070
AB.a	0.180	29.670	5.147	8.010
AC	4.719	11.910	14.641	27.030
AC.a	4.509	12.030	14.640	27.120
AC.b	4.900	11.940	14.635	27.030
AC.c	4.900	11.940	14.635	27.030
AD	4.719	11.910	14.641	27.030
AD.a	4.509	12.030	14.640	27.120
AD.b	4.926	11.940	11.993	0.000
AD.c	4.926	11.940	11.993	0.000
AE	0.290	28.410	4.935	8.070
AE.a	0.180	29.670	5.147	8.010
AE.b	4.720	14.760	11.768	0.000
AE.c	0.145	29.370	4.609	8.580
AE.d	0.145	29.370	4.609	8.580
AE.e	4.720	14.760	11.768	0.000
AF	4.719	11.910	14.641	27.030
AF.a	4.509	12.030	14.640	27.120
AF.b	4.923	11.940	11.993	0.000
AF.c	4.923	11.940	11.993	0.000
AG	4.892	11.940	14.639	27.030
AH	0.180	29.670	5.147	8.010
AI	0.180	29.670	5.147	8.010
AJ	0.180	29.670	5.147	8.010
AK	4.509	12.030	14.640	27.120
AL	4.509	12.030	14.640	27.120
AM	0.180	29.670	5.147	8.010
AN	0.180	29.670	5.147	8.010
AO	0.206	29.670	12.072	0.000
AP	4.509	12.030	14.640	27.120
AQ	4.509	12.030	14.640	27.120
AR	4.509	12.030	14.640	27.120
AS	0.180	29.670	5.147	8.010
AT	0.180	29.670	5.147	8.010

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

AU	0.206	29.670	12.071	0.000
AV	4.509	12.030	14.640	27.120
AW	4.509	12.030	14.640	27.120
AX	0.180	29.670	5.147	8.010
AY	0.180	29.670	5.147	8.010
AZ	0.206	29.670	12.069	0.000
B	-0.021	24.840	4.104	8.010
BA	4.509	12.030	14.640	27.120
BB	4.509	12.030	14.640	27.120
BC	0.180	29.670	5.147	8.010
BD	0.367	18.240	6.325	29.430
BE	-0.133	18.090	5.008	29.220
BF	0.407	0.000	0.407	0.000
BG	0.336	28.650	4.830	8.040
BG.a	0.336	28.650	4.830	8.040
BH	0.335	28.650	4.830	8.040
C	0.055	28.620	4.782	8.130
D	0.290	28.410	4.935	8.070
E	0.290	28.410	4.935	8.070
F	0.290	28.410	4.935	8.070
G	0.335	28.650	4.830	8.040
H	4.719	11.910	14.641	27.030
I	4.719	11.910	14.641	27.030
J	0.290	28.410	4.935	8.070
K	0.290	28.410	4.935	8.070
L	0.318	28.410	12.068	0.000
M	4.719	11.910	14.641	27.030
N	4.719	11.910	14.641	27.030
O	4.719	11.910	14.641	27.030
P	0.290	28.410	4.935	8.070
Q	0.290	28.410	4.935	8.070
R	0.318	28.410	12.067	0.000
S	4.719	11.910	14.641	27.030
T	4.719	11.910	14.641	27.030
U	0.290	28.410	4.935	8.070
V	0.290	28.410	4.935	8.070
W	0.318	28.410	12.065	0.000
X	4.719	11.910	14.641	27.030
Y	4.719	11.910	14.641	27.030
Z	0.290	28.410	4.935	8.070

Extreme values of additional H-component output:

H-component	minimum	time [s]	maximum	time [s]
AIRVva A1				
Fluid level [m]	547.567	29.370	551.219	8.580
Air pressure [barg]	0.907	0.000	5.165	8.580
AIRVva A2				
Fluid level [m]	547.567	29.370	551.219	8.580
Air pressure [barg]	0.907	0.000	5.165	8.580

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

AIRVvn	A1				
Fluid level [m]		547.017	14.730	549.674	0.000
Air pressure [barg]		4.675	14.760	11.461	0.000
Air volume [m3]		13.000	0.000	25.011	14.790
AIRVvn	A2				
Fluid level [m]		547.017	14.730	549.674	0.000
Air pressure [barg]		4.675	14.760	11.461	0.000
Air volume [m3]		13.000	0.000	25.011	14.790
PUMP	P1				
Pump speed [rpm]		28.904	60.000	1336.344	0.000
Fluid torque [kNm]		0.001	60.000	4.523	0.000
Motor torque [kNm]		0.000	0.030	4.523	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	84.327	0.000
Power [kW]		0.000	0.030	632.941	0.000
Energy [kJ]		0.000	0.000	18.988	0.030
PUMP	P2				
Pump speed [rpm]		28.903	60.000	1336.415	0.000
Fluid torque [kNm]		0.001	60.000	4.523	0.000
Motor torque [kNm]		0.000	0.030	4.523	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	84.327	0.000
Power [kW]		0.000	0.030	633.025	0.000
Energy [kJ]		0.000	0.000	18.991	0.030
PUMP	P3				
Pump speed [rpm]		28.904	60.000	1336.344	0.000
Fluid torque [kNm]		0.001	60.000	4.523	0.000
Motor torque [kNm]		0.000	0.030	4.523	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	84.327	0.000
Power [kW]		0.000	0.030	632.941	0.000
Energy [kJ]		0.000	0.000	18.988	0.030
PUMP	P4				
Pump speed [rpm]		0.000	0.000	0.000	0.000
Fluid torque [kNm]		0.000	0.000	0.000	0.000
Motor torque [kNm]		0.000	0.000	0.000	0.000
ON/OFF [-]		0.000	0.000	0.000	0.000
Efficiency [%]		0.000	0.030	84.327	0.000
Power [kW]		0.000	0.000	0.000	0.000
Energy [kJ]		0.000	0.000	0.000	0.000
PUMP	P5				
Pump speed [rpm]		28.877	60.000	1336.733	0.000
Fluid torque [kNm]		0.001	60.000	4.525	0.000
Motor torque [kNm]		0.000	0.030	4.525	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	84.329	0.000
Power [kW]		0.000	0.030	633.404	0.000
Energy [kJ]		0.000	0.000	19.002	0.030
PUMP	P6				
Pump speed [rpm]		28.876	60.000	1336.804	0.000
Fluid torque [kNm]		0.001	60.000	4.525	0.000
Motor torque [kNm]		0.000	0.030	4.525	0.000

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.329	0.000
Power [kW]	0.000	0.030	633.489	0.000
Energy [kJ]	0.000	0.000	19.005	0.030
PUMP P7				
Pump speed [rpm]	28.877	60.000	1336.733	0.000
Fluid torque [kNm]	0.001	60.000	4.525	0.000
Motor torque [kNm]	0.000	0.030	4.525	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	84.329	0.000
Power [kW]	0.000	0.030	633.404	0.000
Energy [kJ]	0.000	0.000	19.002	0.030
PUMP P8				
Pump speed [rpm]	0.000	0.000	0.000	0.000
Fluid torque [kNm]	0.000	0.000	0.000	0.000
Motor torque [kNm]	0.000	0.000	0.000	0.000
ON/OFF [-]	0.000	0.000	0.000	0.000
Efficiency [%]	0.000	0.030	84.329	0.000
Power [kW]	0.000	0.000	0.000	0.000
Energy [kJ]	0.000	0.000	0.000	0.000
VALVE 200 BV1				
Valve position (open) [%]	50.000	0.000	50.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.010	1.680
VALVE 200 BV6				
Valve position (open) [%]	50.000	0.000	50.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.010	1.680
VALVE 600 BV1				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.020	17.910
VALVE 600 BV2				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.020	17.910
VALVE 600 BV3				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.005	0.840
VALVE 600 BV5				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.005	0.840
VALVE EV1				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.630	0.001	0.000
VALVE EV10				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	0.000
VALVE EV2				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.630	0.001	0.000
VALVE EV3				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.630	0.001	0.000
VALVE EV4				
Valve position (open) [%]	100.000	0.000	100.000	0.000

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

Pressure ratio Xf [-]	0.000	0.630	0.001	0.000
VALVE EV5				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	0.000
VALVE EV6				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.780	0.001	0.000
VALVE EV7				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.780	0.001	0.000
VALVE EV8				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.780	0.001	0.000
VALVE EV9				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.780	0.001	0.000
VALVE SMS 600 BV				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.630	0.001	0.030
VALVE SMS 601				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.630	0.001	0.030
VALVE SMS 602				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.630	0.001	0.000
VALVE SMS 603				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	0.000
VALVE SMS 604				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.780	0.001	0.000
VALVE SMS 605				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.780	0.001	0.030
VALVE SMS 606				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.780	0.001	0.000
VALVE SMS 607				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	0.000

Component messages:

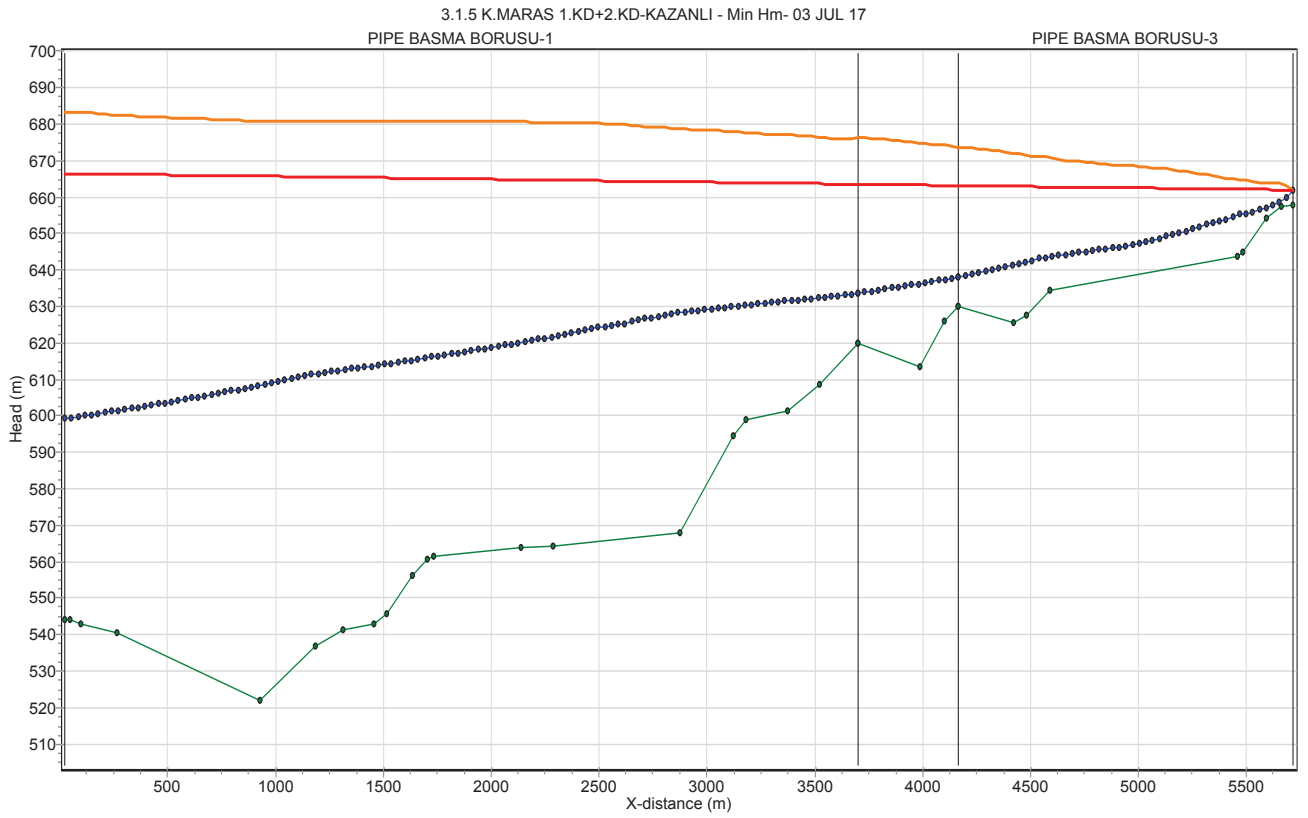
At	0.0000	s	VALVE	EV1	Starts in open phase
At	0.0000	s	VALVE	EV6	Starts in open phase
At	0.0000	s	VALVE	600 BV2	Starts in open phase
At	0.0000	s	VALVE	600 BV1	Starts in open phase
At	0.0000	s	VALVE	EV2	Starts in open phase
At	0.0000	s	PUMP	P1	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 600 BV	Starts in open phase
At	0.0000	s	VALVE	EV3	Starts in open phase
At	0.0000	s	PUMP	P2	Pump specific speed = 26.0

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

At	0.0000	s	VALVE	SMS 601	Starts in open phase
At	0.0000	s	VALVE	EV4	Starts in open phase
At	0.0000	s	PUMP	P3	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 602	Starts in open phase
At	0.0000	s	VALVE	EV5	Starts in open phase
At	0.0000	s	PUMP	P4	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 603	Starts in open phase
At	0.0000	s	VALVE	600 BV5	Starts in open phase
At	0.0000	s	VALVE	600 BV3	Starts in open phase
At	0.0000	s	VALVE	200 BV1	Starts in open phase
At	0.0000	s	VALVE	200 BV6	Starts in open phase
At	0.0000	s	VALVE	EV7	Starts in open phase
At	0.0000	s	PUMP	P5	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 604	Starts in open phase
At	0.0000	s	VALVE	EV8	Starts in open phase
At	0.0000	s	PUMP	P6	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 605	Starts in open phase
At	0.0000	s	VALVE	EV9	Starts in open phase
At	0.0000	s	PUMP	P7	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 606	Starts in open phase
At	0.0000	s	VALVE	EV10	Starts in open phase
At	0.0000	s	PUMP	P8	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 607	Starts in open phase
At	0.0000	s	PUMP	P1	Initial pump speed = 1336.344 [rpm]
At	0.0000	s	PUMP	P2	Initial pump speed = 1336.415 [rpm]
At	0.0000	s	PUMP	P3	Initial pump speed = 1336.344 [rpm]
At	0.0000	s	PUMP	P5	Initial pump speed = 1336.733 [rpm]
At	0.0000	s	PUMP	P6	Initial pump speed = 1336.804 [rpm]
At	0.0000	s	PUMP	P7	Initial pump speed = 1336.733 [rpm]
At	0.0000	s	AIRVva	A1	Air inlet is closed
At	0.0000	s	AIRVva	A2	Air inlet is closed
At	0.0000	s	CHECKV	C1	Starts in open phase
At	0.0000	s	CHECKV	C2	Starts in open phase
At	0.0000	s	CHECKV	C3	Starts in open phase
At	0.0000	s	CHECKV	C4	Starts in closed phase
At	0.0000	s	CHECKV	C10	Starts in closed phase
At	0.0000	s	CHECKV	C9	Starts in closed phase
At	0.0000	s	CHECKV	C5	Starts in open phase
At	0.0000	s	CHECKV	C6	Starts in open phase
At	0.0000	s	CHECKV	C7	Starts in open phase
At	0.0000	s	CHECKV	C8	Starts in closed phase
At	0.30000E-01	s	PUMP	P1	tripping
At	0.30000E-01	s	PUMP	P2	tripping
At	0.30000E-01	s	PUMP	P3	tripping
At	0.30000E-01	s	PUMP	P4	tripping
At	0.30000E-01	s	PUMP	P5	tripping
At	0.30000E-01	s	PUMP	P6	tripping
At	0.30000E-01	s	PUMP	P7	tripping
At	0.30000E-01	s	PUMP	P8	tripping
At	0.90000E-01	s	CHECKV	C10	Opens
At	0.90000E-01	s	CHECKV	C9	Opens
At	0.63000	s	CHECKV	C1	Closes

3.1.4 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI -03 JUL 17.wor

At	0.63000	s	CHECKV	C3	Closes
At	0.66000	s	CHECKV	C2	Closes
At	0.78000	s	CHECKV	C5	Closes
At	0.78000	s	CHECKV	C6	Closes
At	0.78000	s	CHECKV	C7	Closes
At	14.670	s	CHECKV	C10	Closes
At	14.670	s	CHECKV	C9	Closes



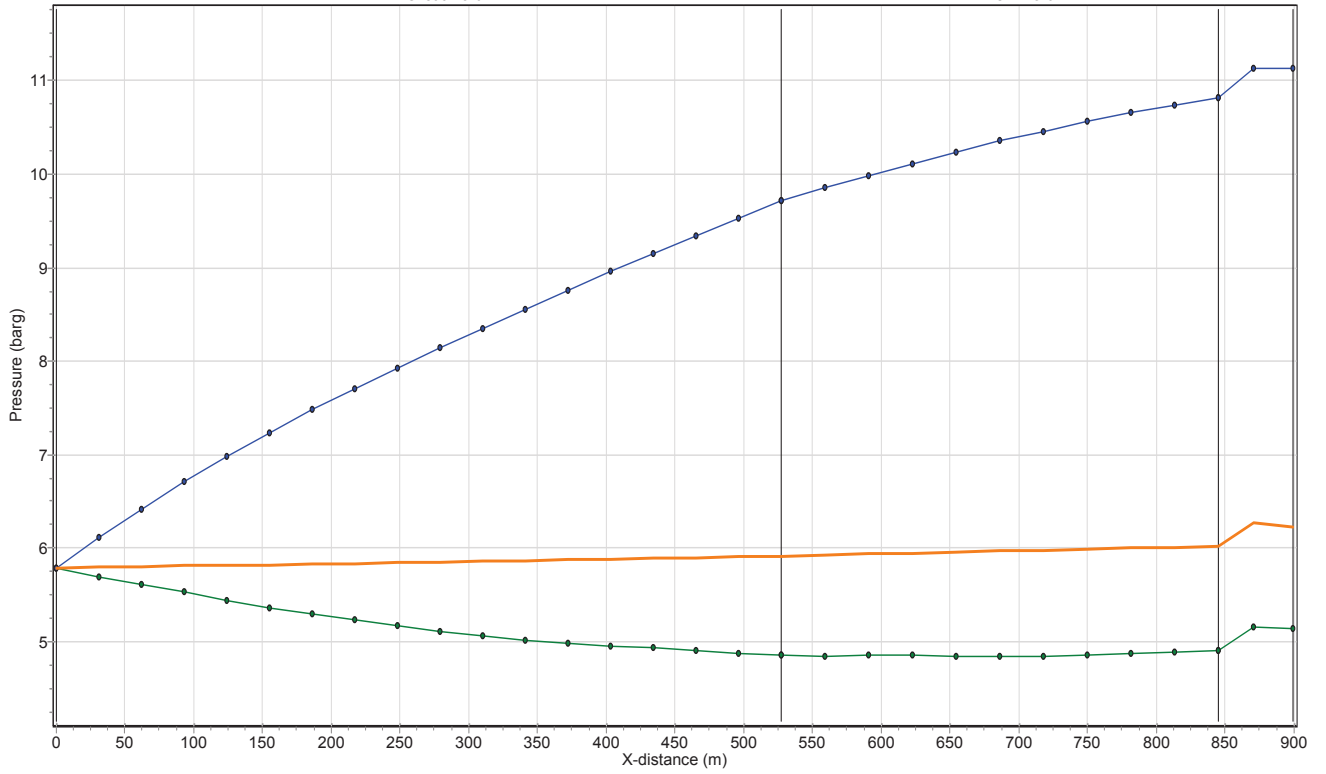
Labels Profile (MARAS IS) Head min (MARAS IS) Head max (MARAS IS) Head 0.00s (MARAS IS)

DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALI FENERCIOĞLU\MARAS ICMESUY-KURSAT KARAPINARI\3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.

3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17

PIPE Mevcut Boru

PIPE Yeni Boru



Labels

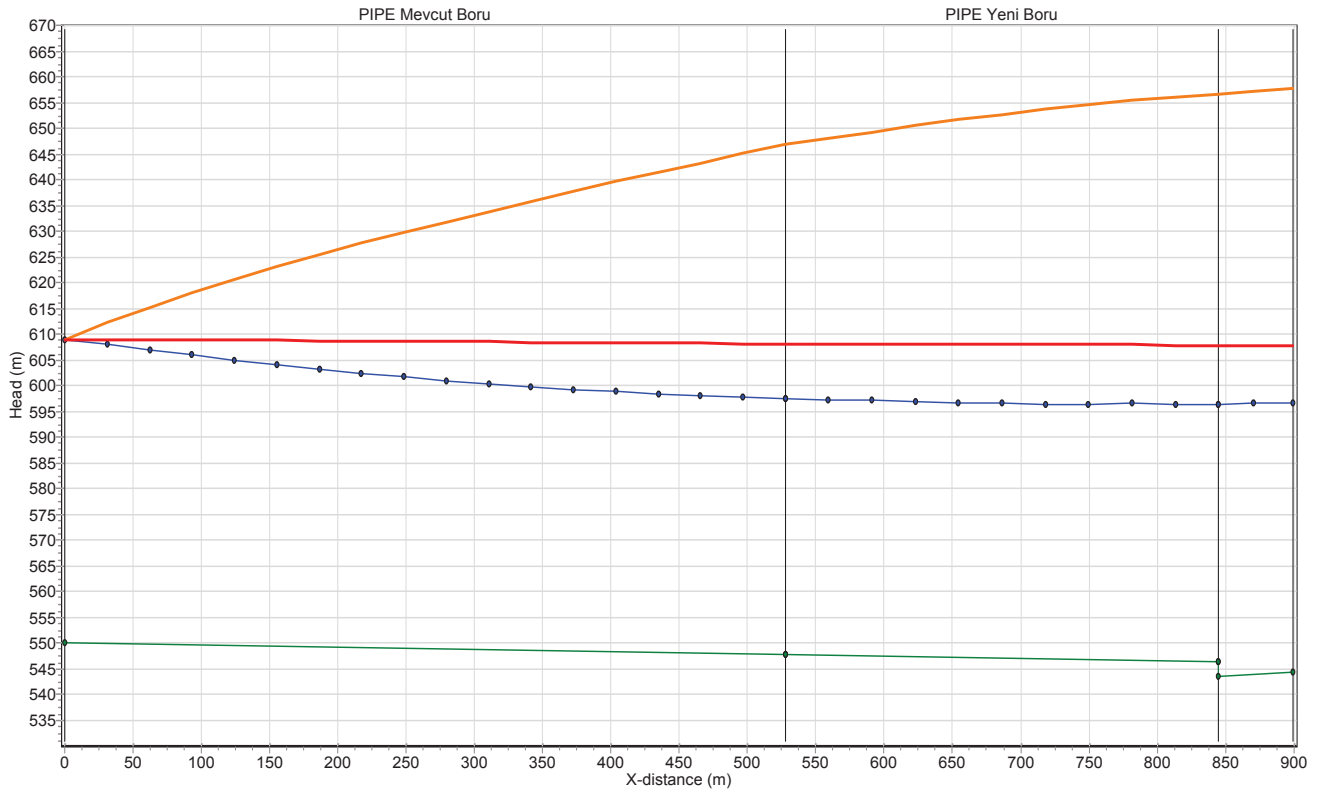
Pressure min (MARAS IS)

Pressure max (MARAS IS)

Pressure 0.00s (MARAS IS)

DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALI FENERCİOĞLU\MARAS İÇMESUY-KURSAT KARAPINARI\3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.

3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17



Labels

Profile (MARAS IS)

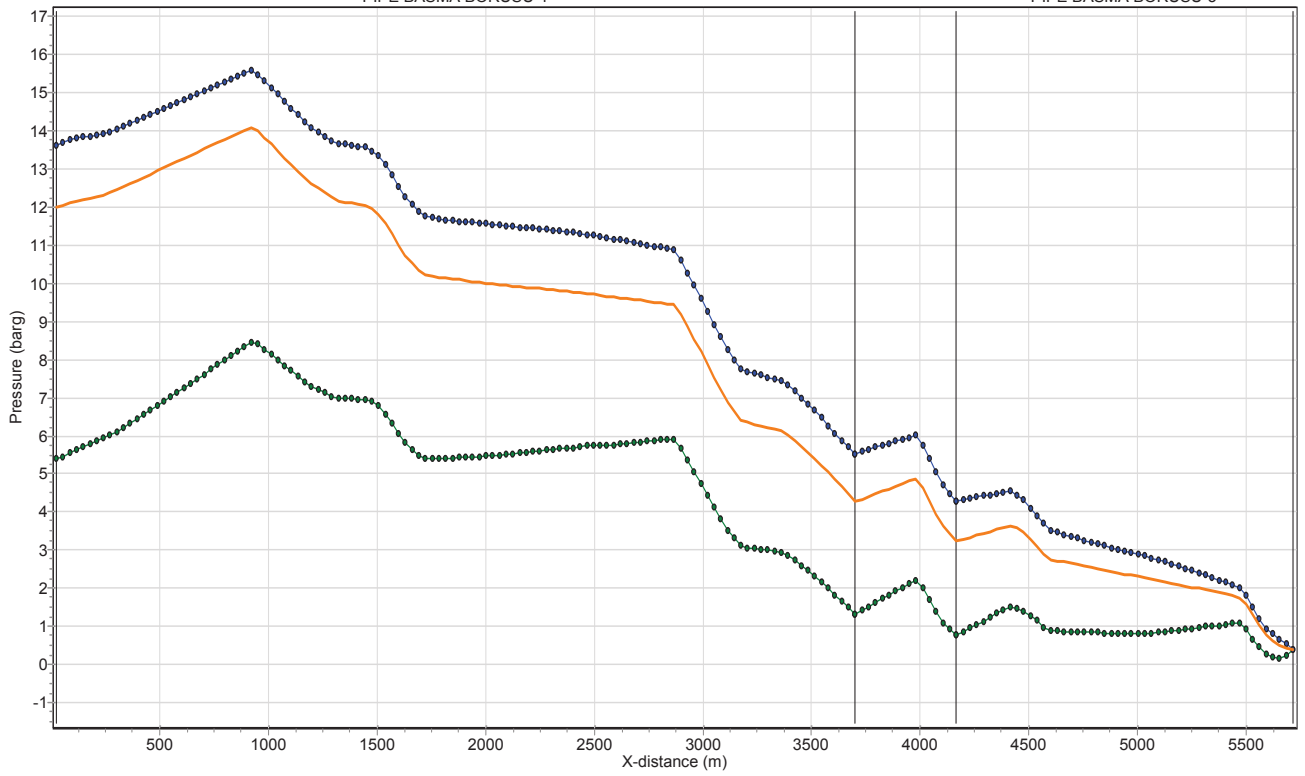
Head min (MARAS IS)

Head max (MARAS IS)

Head 0.00s (MARAS IS)

3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17
PIPE BASMA BORUSU-1

PIPE BASMA BORUSU-3



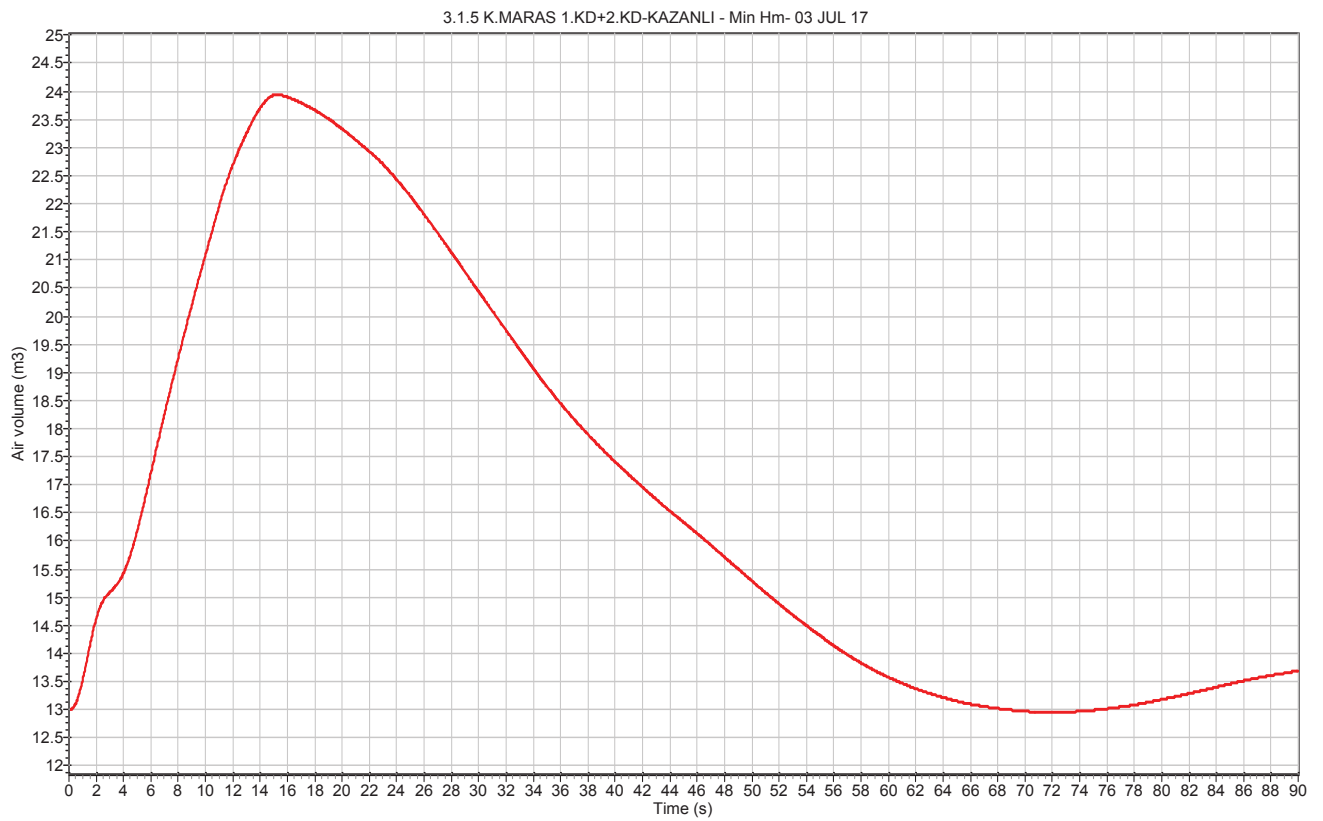
Labels

Pressure min (MARAS IS)

Pressure max (MARAS IS)

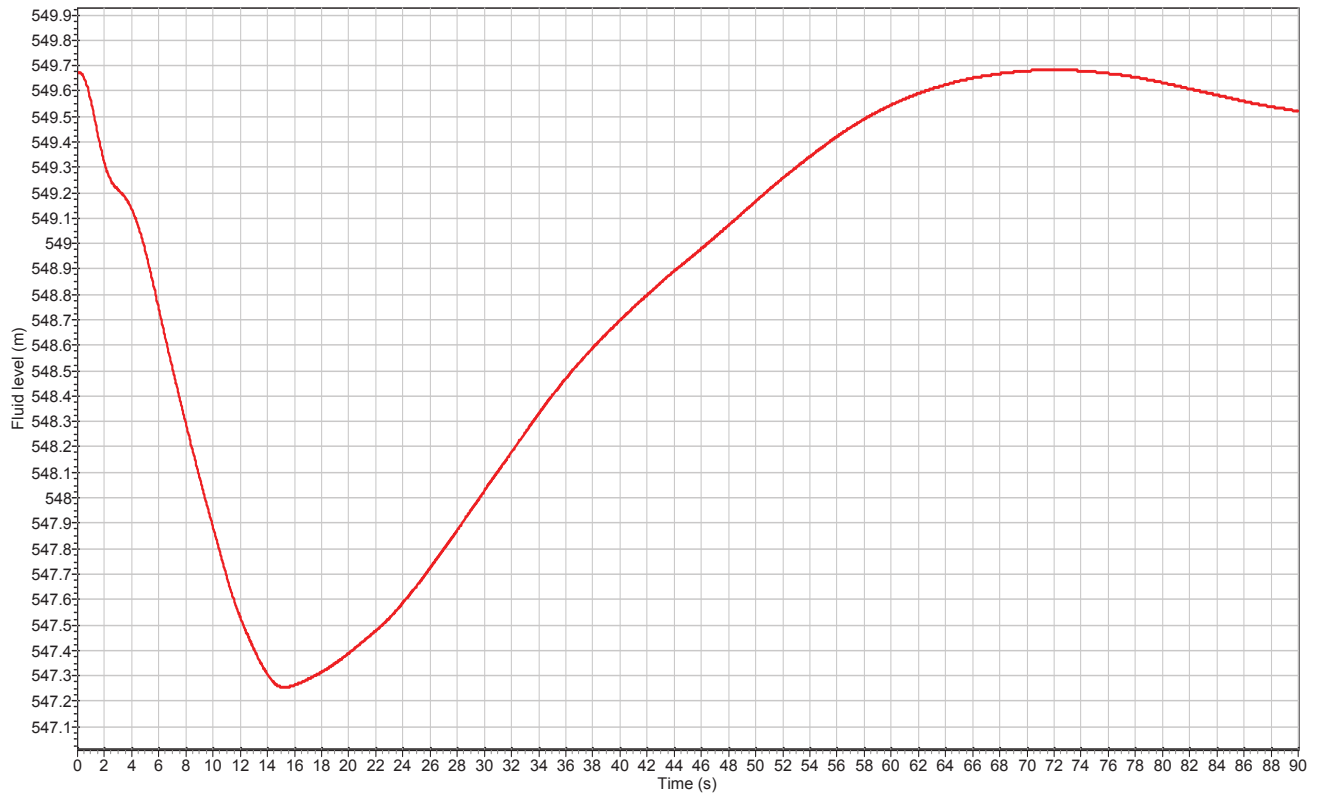
Pressure 0.00s (MARAS IS)

DISC, APRIL27, 2009, 01 46 AM-NEW 13 DEC 11\Eski-dosyalar\ALI FENERCIOĞLU\MARAS ICMESUY-KURSAT KARAPINARI\3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.



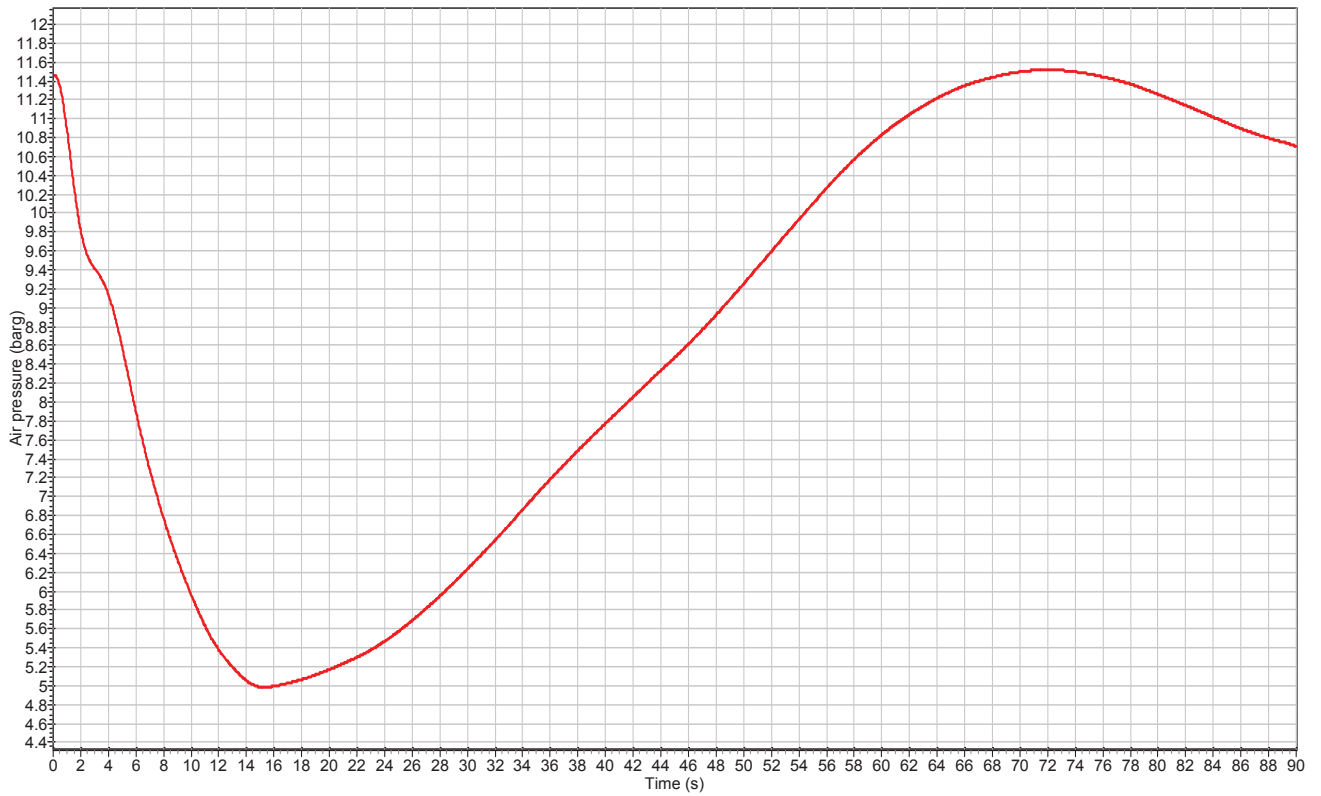
— Air volume AIRV/vn A2 (MARAS IS)

3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17



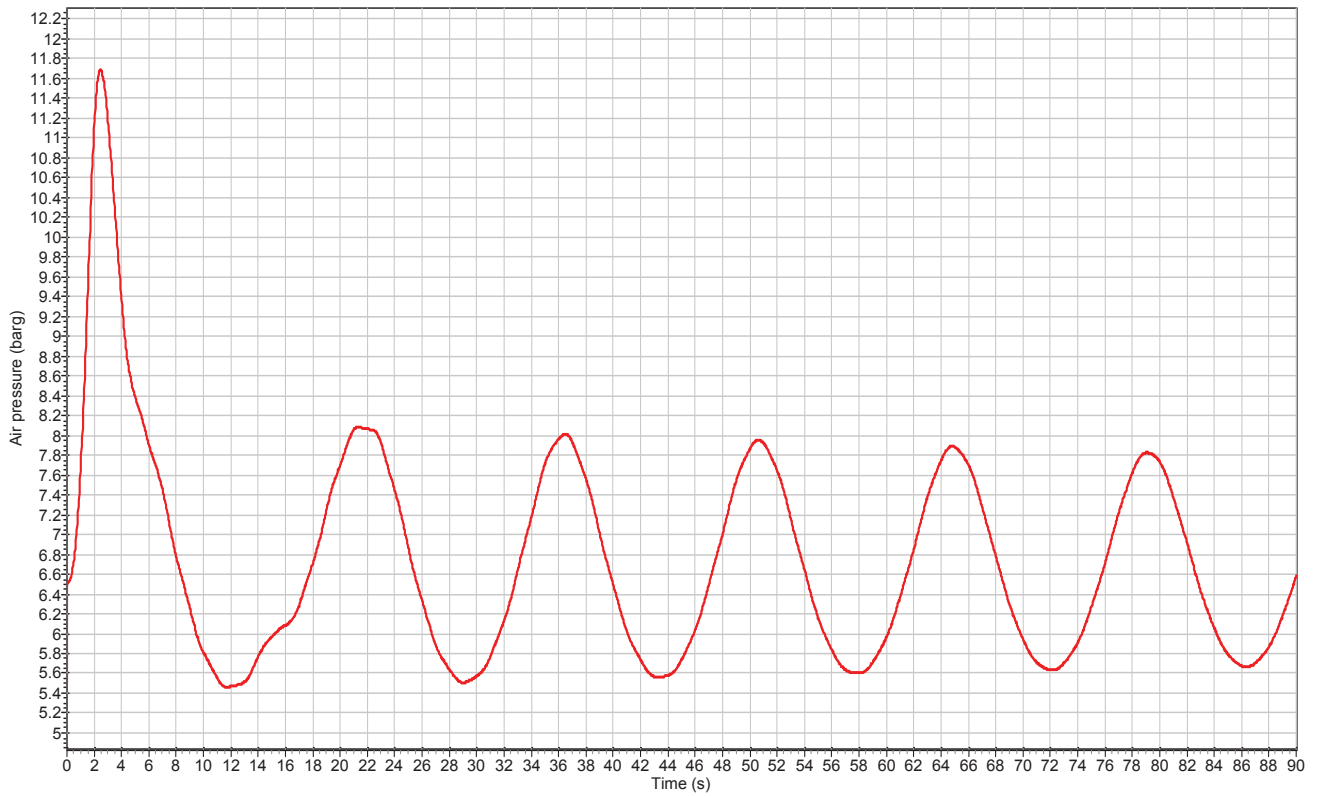
— Fluid level AIRVvn A2 (MARAS IS)

3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17



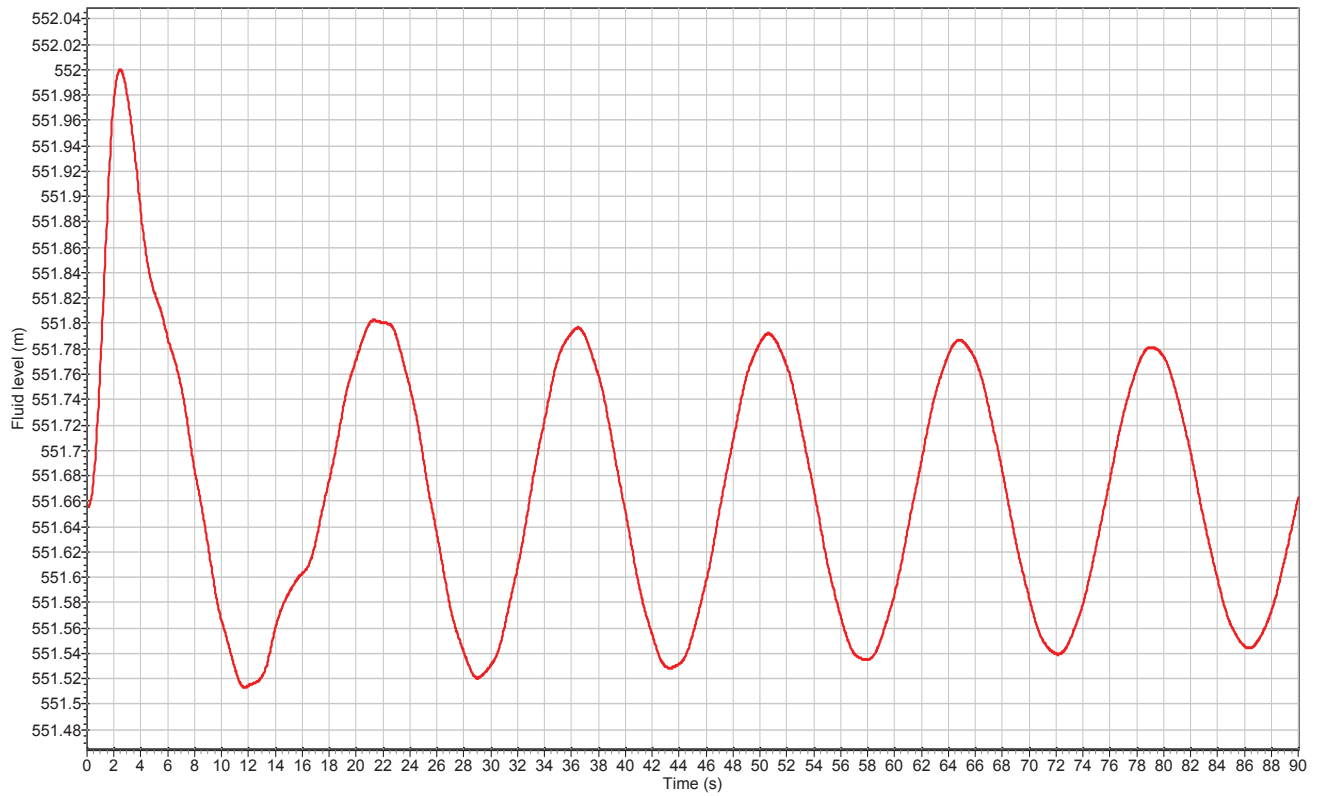
— Air pressure AIRVvn A2 (MARAS IS)

3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17



— Air pressure AIRVva A1 (MARAS IS)

3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17



— Fluid level AIRVva A1 (MARAS IS)

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 11:47:32

Case : 3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17

Title: 3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17

Case description:

=====

3.1.4 K.MARAS 1.KD+2.KD-KAZANLI-03 JUL 17

H-scheme connectivity:

=====

lhs H-node	H-component	rhs H-node
AE.d	AIRVva A1	
AE.c	AIRVva A2	
AE.b	AIRVvn A1	
AE.e	AIRVvn A2	
BF	BOUNDH ARITMA G.	
A	BOUNDH MENZELET BRJ	
L	CHECKV C1	M
AD.c	CHECKV C10	AC.c
R	CHECKV C2	S
W	CHECKV C3	X
AB	CHECKV C4	AC
AO	CHECKV C5	AP
AU	CHECKV C6	AV
AZ	CHECKV C7	BA
AB.a	CHECKV C8	AC.a
AD.b	CHECKV C9	AC.b
G	PIPE 1100 B.	D
□	PIPE 1101	AH
AG	PIPE BASMA BORUSU-1	BD
BD	PIPE BASMA BORUSU-2	BE
BE	PIPE BASMA BORUSU-3	BF
AF.a	PIPE KOL115	AG
AF	PIPE KOL15	AG
A	PIPE Mevcut Boru	B
B	PIPE Yeni Boru	C
C	PIPE Yeni Boru.a	BH
D	PRIGID KOL1	E
T	PRIGID KOL10	H
F	PRIGID KOL11	U
AW	PRIGID KOL110	AK

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

AJ	PRIGID	KOL111	AX
BB	PRIGID	KOL112	AL
AE.a	PRIGID	KOL113	BC
AD.a	PRIGID	KOL114	AF.a
Y	PRIGID	KOL12	I
AE	PRIGID	KOL13	Z
AD	PRIGID	KOL14	AF
AH	PRIGID	KOL16	AI
AI	PRIGID	KOL17	AJ
AJ	PRIGID	KOL18	AE.a
AH	PRIGID	KOL19	AM
E	PRIGID	KOL2	F
AQ	PRIGID	KOL20	AR
AR	PRIGID	KOL21	AK
AK	PRIGID	KOL22	AL
AL	PRIGID	KOL23	AF.a
AI	PRIGID	KOL24	AS
F	PRIGID	KOL3	AE
D	PRIGID	KOL4	J
N	PRIGID	KOL5	O
O	PRIGID	KOL6	H
H	PRIGID	KOL7	I
I	PRIGID	KOL8	AF
E	PRIGID	KOL9	P
AF.b	PRIGID	P-BYP	AD.b
AF.c	PRIGID	P-BYP.a	AD.c
AD.b	PRIGID	P-CON	AE.b
BG	PRIGID	P-CON.a	AE.c
BG.a	PRIGID	P-CON.b	AE.d
AD.c	PRIGID	P-CON.c	AE.e
K	PUMP	P1	L
Q	PUMP	P2	R
V	PUMP	P3	W
AA	PUMP	P4	AB
AN	PUMP	P5	AO
AT	PUMP	P6	AU
AY	PUMP	P7	AZ
AA.a	PUMP	P8	AB.a
AF.c	VALVE	200 BV1	AC.c
AF.b	VALVE	200 BV6	AC.b
BG	VALVE	600 BV1	BH
BG.a	VALVE	600 BV2	BH
AC.c	VALVE	600 BV3	AG
AC.b	VALVE	600 BV5	AG
BH	VALVE	EV1	G
BC	VALVE	EV10	AA.a
J	VALVE	EV2	K
P	VALVE	EV3	Q
U	VALVE	EV4	V
Z	VALVE	EV5	AA
BH	VALVE	EV6	□
AM	VALVE	EV7	AN

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

AS	VALVE	EV8	AT
AX	VALVE	EV9	AY
M	VALVE	SMS 600 BV	N
S	VALVE	SMS 601	T
X	VALVE	SMS 602	Y
AC	VALVE	SMS 603	AD
AP	VALVE	SMS 604	AQ
AV	VALVE	SMS 605	AW
BA	VALVE	SMS 606	BB
AC.a	VALVE	SMS 607	AD.a

H-node heights:

=====

H-node	height [m]
□	544.250
A	550.000
AA	544.250
AA.a	544.250
AB	544.250
AB.a	544.250
AC	544.250
AC.a	544.250
AC.b	544.250
AC.c	544.250
AD	544.250
AD.a	544.250
AD.b	544.250
AD.c	544.250
AE	544.250
AE.a	544.250
AE.b	546.550
AE.c	546.550
AE.d	546.550
AE.e	546.550
AF	544.250
AF.a	544.250
AF.b	544.250
AF.c	544.250
AG	544.250
AH	544.250
AI	544.250
AJ	544.250
AK	544.250
AL	544.250
AM	544.250
AN	544.250
AO	544.250
AP	544.250
AQ	544.250

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

AR	544.250
AS	544.250
AT	544.250
AU	544.250
AV	544.250
AW	544.250
AX	544.250
AY	544.250
AZ	544.250
B	547.800
BA	544.250
BB	544.250
BC	544.250
BD	620.010
BE	630.180
BF	657.850
BG	544.250
BG.a	544.250
BH	544.250
C	546.450
D	544.250
E	544.250
F	544.250
G	544.250
H	544.250
I	544.250
J	544.250
K	544.250
L	544.250
M	544.250
N	544.250
O	544.250
P	544.250
Q	544.250
R	544.250
S	544.250
T	544.250
U	544.250
V	544.250
W	544.250
X	544.250
Y	544.250
Z	544.250

Pipe profiles:

PIPE 1100 B. :

X-distance [m]	Height [m]
0.0000	544.25
23.150	544.25

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

PIPE 1101 :

X-distance	Height
[m]	[m]
0.0000	544.25
51.700	544.25

PIPE BASMA BORUSU-1 :

X-distance	Height
[m]	[m]
0.0000	544.25
24.730	544.03
74.190	542.88
241.93	540.47
905.17	521.95
1162.8	536.76
1287.9	541.48
1434.8	542.87
1493.5	545.64
1611.2	556.25
1678.1	560.61
1708.1	561.37
2113.4	563.79
2262.5	564.32
2851.7	568.07
3095.7	594.62
3156.7	598.90
3349.6	601.52
3496.7	608.80
3676.3	620.01

PIPE BASMA BORUSU-2 :

X-distance	Height
[m]	[m]
0.0000	620.01
288.72	613.40
400.36	625.94
466.43	630.18

PIPE BASMA BORUSU-3 :

X-distance	Height
[m]	[m]
0.0000	630.18
256.23	625.62
312.25	627.71
424.29	634.60
1291.3	643.85
1319.4	644.85
1423.5	654.15
1495.1	657.30
1549.4	657.85

PRIGID KOL1 :

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL10 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL11 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL110 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL111 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL112 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PRIGID KOL113 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PRIGID KOL114 :

X-distance	Height
[m]	[m]
0.0000	544.25
15.200	544.25

PIPE KOL115 :

X-distance	Height
[m]	[m]
0.0000	544.25
49.520	544.25

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

PRIGID	KOL12	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25
PRIGID	KOL13	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PRIGID	KOL14	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			15.200	544.25
PIPE	KOL15	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			25.380	544.25
PRIGID	KOL16	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL17	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL18	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			4.2500	544.25
PRIGID	KOL19	:		
			X-distance	Height
			[m]	[m]
			0.0000	544.25
			7.1000	544.25
PRIGID	KOL2	:		
			X-distance	Height
			[m]	[m]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

0.0000 544.25
4.2500 544.25

PRIGID KOL20 :

X-distance Height
[m] [m]
0.0000 544.25
15.200 544.25

PRIGID KOL21 :

X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL22 :

X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL23 :

X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL24 :

X-distance Height
[m] [m]
0.0000 544.25
7.1000 544.25

PRIGID KOL3 :

X-distance Height
[m] [m]
0.0000 544.25
4.2500 544.25

PRIGID KOL4 :

X-distance Height
[m] [m]
0.0000 544.25
7.1000 544.25

PRIGID KOL5 :

X-distance Height
[m] [m]
0.0000 544.25
15.200 544.25

PRIGID KOL6 :

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL7 :

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL8 :

X-distance	Height
[m]	[m]
0.0000	544.25
4.2500	544.25

PRIGID KOL9 :

X-distance	Height
[m]	[m]
0.0000	544.25
7.1000	544.25

PIPE Mevcut Boru :

X-distance	Height
[m]	[m]
0.0000	550.00
527.65	547.80

PRIGID P-BYP :

X-distance	Height
[m]	[m]
0.0000	544.25
4.0000	544.25

PRIGID P-BYP.a :

X-distance	Height
[m]	[m]
0.0000	544.25
4.0000	544.25

PRIGID P-CON :

X-distance	Height
[m]	[m]
0.0000	544.25
8.0000	544.25
8.0000	546.55

PRIGID P-CON.a :

X-distance	Height
[m]	[m]
0.0000	544.25

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

8.0000	544.25
8.0000	546.55

PRIGID P-CON.b :

X-distance	Height
[m]	[m]
0.0000	544.25
8.0000	544.25
8.0000	546.55

PRIGID P-CON.c :

X-distance	Height
[m]	[m]
0.0000	544.25
8.0000	544.25
8.0000	546.55

PIPE Yeni Boru :

X-distance	Height
[m]	[m]
0.0000	547.80
317.35	546.45

PIPE Yeni Boru.a :

X-distance	Height
[m]	[m]
0.0000	546.45
0.0000	543.45
54.490	544.25

Fluid specifications:

=====

Fluid name	:	water	[-]
density	:	1000.	[kg/m3]
bulk modulus	:	0.2100E+10	[N/m2]
vapour pressure	:	0.1707E-01	[bar.a]
kinematic viscosity	:	0.1000E-05	[m2/s]

Physical constants:

=====

gravitational acceleration	:	9.810	[m/s2]
atmospheric pressure	:	1.014	[bar.a]

Time parameters

=====

time step	:	0.3000E-01	[s]
simulation end time	:	90.00	[s]

H-component input specifications:

=====

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

AIRVva	A1	vert. vented	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Air inlet level	:	546.8	[m]
	Chamber area	:	4.520	[m2]
	Laplace coefficient	:	1.200	[-]
AIRVva	A2	vert. vented	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Air inlet level	:	546.8	[m]
	Chamber area	:	4.520	[m2]
	Laplace coefficient	:	1.200	[-]
AIRVvn	A1	vert.n.-vent	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Chamber area	:	4.520	[m2]
	Air quantity by	:	Air volume	
	Initial fluid level	:		[m]
	Initial air volume	:	13.00	[m3]
	Initial C in P*V=C	:		[kJ]
	Laplace coefficient	:	1.200	[-]
AIRVvn	A2	vert.n.-vent	Model name:	
	Comment	:		
	Keywords	:		
	Reference Id	:		
	Top level	:	552.5	[m]
	Bottom level	:	546.5	[m]
	Chamber area	:	4.520	[m2]
	Air quantity by	:	Air volume	
	Initial fluid level	:		[m]
	Initial air volume	:	13.00	[m3]
	Initial C in P*V=C	:		[kJ]
	Laplace coefficient	:	1.200	[-]
BOUNDH	ARITMA G.	-	Model name:	
	Comment	:		S: 659.00 m
	Keywords	:		
	Reference Id	:		
	Pressure head at t = 0 [s]	:	662.0	[m]

BOUNDH MENZELET BRJ - Model name:
 Comment :
 Keywords :
 Reference Id :
 Pressure head at t = 0 [s] : 609.0 [m]

CHECKV C1 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C10 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.500 [-]
 Delta_p for reopen : 0.1000 [bar]
 Initial state : Closed

CHECKV C2 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C3 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C4 delta_p Model name:
 Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Closed

CHECKV C5 delta_p Model name:

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C6 delta_p Model name:

Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C7 delta_p Model name:

Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Open

CHECKV C8 delta_p Model name:

Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.600 [-]
 Delta_p for reopen : 0.5000E-01 [bar]
 Initial state : Closed

CHECKV C9 delta_p Model name:

Comment :
 Keywords :
 Reference Id :
 Inner diameter : 600.0 [mm]
 Loss coefficient : 1.500 [-]
 Delta_p for reopen : 0.1000 [bar]
 Initial state : Closed

PIPE 1100 B. Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 2
 Tee; flow through branch 0.900

PIPE 1101 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 2
 Tee; flow through branch 0.900

PIPE BASMA BORUSU-1 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01 66
 Elbow 11,25 degr; R=1.5D 0.500E-01

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir
Tee; flow through run 0.300
Tee; flow through branch 0.900

PIPE BASMA BORUSU-2 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1692. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 17.50 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number
Diameter
[mm]
Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01 11
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300
Tee; flow through branch 0.900

PIPE BASMA BORUSU-3 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1692. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 17.50 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number
Diameter
[mm]
Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01 17
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300
Tee; flow through branch 0.900

PIPE KOL115 Pipe_Xi Model name:
Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Waterhammer
Inner diameter : 1100. [mm]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE

KOL15

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE

Mevcut Boru

Pipe_Xi

Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1495. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 14.30 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200 1
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PIPE Yeni Boru Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200 1
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PIPE Yeni Boru.a Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Waterhammer
 Inner diameter : 1692. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 17.50 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 1
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL1 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Inner diameter	:	1100.	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL10 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL11 Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:	St	
Calculation mode:		Rigid column	
Inner diameter	:	700.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL110 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL111 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL112 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Calculation mode: Rigid column

Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	11.00	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL113 Pipe_Xi Model name:

Comment	:
Keywords	:
Reference Id	:
Material name	: St
Calculation mode:	Rigid column
Inner diameter	: 700.0 [mm]
Wall roughness	: 0.1500 [mm]
Wall thickness	: 11.00 [mm]
Young's modulus	: 0.2100E+12 [N/m2]
local losses	Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL114 Pipe_Xi Model name:

Comment	:
Keywords	:
Reference Id	:
Material name	: St
Calculation mode:	Rigid column
Inner diameter	: 600.0 [mm]
Wall roughness	: 0.1500 [mm]
Wall thickness	: 11.00 [mm]
Young's modulus	: 0.2100E+12 [N/m2]
local losses	Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL12	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL13	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	: St	
	Calculation mode:	Rigid column	
	Inner diameter	:	700.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL14	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Material name : St
Calculation mode: Rigid column
Inner diameter : 600.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL16 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900

PRIGID KOL17 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL18	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Rigid column
	Inner diameter	:	1100. [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID	KOL19	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	St
	Calculation mode:		Rigid column
	Inner diameter	:	700.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	11.00 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID	KOL2	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL20 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120 2
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900 1

PRIGID KOL21 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL22 Pipe_Xi Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 1100. [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL23 Pipe_Xi Model name:

Comment :

Keywords :

Reference Id :

Material name : St

Calculation mode: Rigid column

Inner diameter : 1100. [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 11.00 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL24 Pipe_Xi Model name:

Comment :

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120 2
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900 1

PRIGID KOL3 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 1100. [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
Elbow 45 degr; R=1.5D 0.120
Elbow 22,5 degr; R=1.5D 0.800E-01
Elbow 11,25 degr; R=1.5D 0.500E-01
Tee; flow through run 0.300 1
Tee; flow through branch 0.900

PRIGID KOL4 Pipe_Xi Model name:

Comment :
Keywords :
Reference Id :
Material name : St
Calculation mode: Rigid column
Inner diameter : 700.0 [mm]
Wall roughness : 0.1500 [mm]
Wall thickness : 11.00 [mm]
Young's modulus : 0.2100E+12 [N/m2]
local losses Loss coef Xi Number

Diameter

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir
[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL5 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 600.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID KOL6 Pipe_Xi Model name:
 Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	

PRIGID KOL7 Pipe_Xi Model name:

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL8 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 1100. [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D 0.200
 Elbow 45 degr; R=1.5D 0.120
 Elbow 22,5 degr; R=1.5D 0.800E-01
 Elbow 11,25 degr; R=1.5D 0.500E-01
 Tee; flow through run 0.300 1
 Tee; flow through branch 0.900

PRIGID KOL9 Pipe_Xi Model name:

Comment :
 Keywords :
 Reference Id :
 Material name : St
 Calculation mode: Rigid column
 Inner diameter : 700.0 [mm]
 Wall roughness : 0.1500 [mm]
 Wall thickness : 11.00 [mm]
 Young's modulus : 0.2100E+12 [N/m2]
 local losses Loss coef Xi Number

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	2
Elbow 22,5 degr; R=1.5D	0.800E-01	
Elbow 11,25 degr; R=1.5D	0.500E-01	
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	1

PRIGID

P-BYP

Pipe_Xi

Model name:

Comment :

Keywords :

Reference Id :

Material name :

Calculation mode: Rigid column

Inner diameter : 200.0 [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 4.000 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	2
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	2
STRAINER.....	2.00	

PRIGID

P-BYP.a

Pipe_Xi

Model name:

Comment :

Keywords :

Reference Id :

Material name :

Calculation mode: Rigid column

Inner diameter : 200.0 [mm]

Wall roughness : 0.1500 [mm]

Wall thickness : 4.000 [mm]

Young's modulus : 0.2100E+12 [N/m2]

local losses Loss coef Xi Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	2
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	
Tee; flow through run	0.300	
Tee; flow through branch	0.900	2

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir
STRAINER..... 2.00

PRIGID	P-CON	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	
	Calculation mode:	Rigid column	
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	4.000 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number
Diameter			
			[-]
[mm]			
	Elbow 90 degr; R=1.5D		0.200
	Elbow 45 degr; R=1.5D		0.120
	Ball valve 100% open		0.250
	Diffusor 1:4		0.100 2
	Tee; flow through run		0.300 1
	Tee; flow through branch		0.900
	STRAINER.....		2.00

PRIGID	P-CON.a	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	
	Calculation mode:	Rigid column	
	Inner diameter	:	600.0 [mm]
	Wall roughness	:	0.1500 [mm]
	Wall thickness	:	4.000 [mm]
	Young's modulus	:	0.2100E+12 [N/m2]
	local losses		Loss coef Xi Number
Diameter			
			[-]
[mm]			
	Elbow 90 degr; R=1.5D		0.200
	Elbow 45 degr; R=1.5D		0.120
	Ball valve 100% open		0.250
	Diffusor 1:4		0.100 2
	Tee; flow through run		0.300 1
	Tee; flow through branch		0.900
	STRAINER.....		2.00

PRIGID	P-CON.b	Pipe_Xi	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Material name	:	
	Calculation mode:	Rigid column	

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	4.000	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	2
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	
STRAINER.....	2.00	

PRIGID P-CON.c Pipe_Xi Model name:

Comment	:		
Keywords	:		
Reference Id	:		
Material name	:		
Calculation mode:		Rigid column	
Inner diameter	:	600.0	[mm]
Wall roughness	:	0.1500	[mm]
Wall thickness	:	4.000	[mm]
Young's modulus	:	0.2100E+12	[N/m2]
local losses		Loss coef Xi	Number

Diameter

[-]

[mm]

Elbow 90 degr; R=1.5D	0.200	
Elbow 45 degr; R=1.5D	0.120	
Ball valve 100% open	0.250	
Diffusor 1:4	0.100	2
Tee; flow through run	0.300	1
Tee; flow through branch	0.900	
STRAINER.....	2.00	

PUMP P1 Model name:

Comment	:	
Keywords	:	
Reference Id	:	KSB Omega 300-700 A
Characteristic type	:	QHE
QHE_table	:	Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000
700.00	74.000
750.00	70.000

Suter : Table

Suter : Table

Rated speed : 1450. [rpm]

Q in best point of eff. : [l/s]

H in best point of eff. : [m]

T in best point of eff. : [kNm]

Initial setting : Discharge

Initial speed : [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

Trip time : 0.000 [s]

Action table speed : Table

Action table motorfreq. : Table

Minimum speed for tripping : 20.00 [rpm]

Minimum rel.freq. for tripping: [%]

Required speed : [rpm]

Minimum speed : [rpm]

Maximum speed : [rpm]

Maximum power : [kW]

Level ON : [m]

Level OFF : [m]

Start time (0 to max) : [s]

Stop time (max to 0) : [s]

PUMP P2 Model name:

Comment :

Keywords :

Reference Id : KSB Omega 300-700 A

Characteristic type : QHE

QHE_table : Table

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

QHE_table	: Table
Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000
700.00	74.000
750.00	70.000

Suter	: Table
Suter	: Table
Rated speed	: 1450. [rpm]
Q in best point of eff.	: [l/s]
H in best point of eff.	: [m]
T in best point of eff.	: [kNm]
Initial setting	: Discharge
Initial speed	: [rpm]
Initial suction head	: [m]
Initial pressure head	: [m]
Initial discharge	: 500.0 [l/s]
Initial relative frequency	: [%]
Speed-Torque char. of motor	: Table
Polar moment of inertia	: 30.00 [kgm2]
Drive type	: Trip
Trip time	: 0.000 [s]
Action table speed	: Table
Action table motorfreq.	: Table
Minimum speed for tripping	: 20.00 [rpm]
Minimum rel.freq. for tripping:	: [%]
Required speed	: [rpm]
Minimum speed	: [rpm]
Maximum speed	: [rpm]
Maximum power	: [kW]
Level ON	: [m]
Level OFF	: [m]
Start time (0 to max)	: [s]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir
 Stop time (max to 0) : [s]

PUMP

P3 Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000
700.00	74.000
750.00	70.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Discharge
 Initial speed : [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P4 Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000
700.00	74.000
750.00	70.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Speed
 Initial speed : 0.000 [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P5

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge [l/s]	Pump head [m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

QHE_table : Table

Discharge [l/s]	Efficiency [%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000
700.00	74.000
750.00	70.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Discharge
 Initial speed : [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P6

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

QHE_table

: Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

565.00	84.000
600.00	82.000
655.00	78.000
700.00	74.000
750.00	70.000

Suter : Table
 Suter : Table
 Rated speed : 1450. [rpm]
 Q in best point of eff. : [l/s]
 H in best point of eff. : [m]
 T in best point of eff. : [kNm]
 Initial setting : Discharge
 Initial speed : [rpm]
 Initial suction head : [m]
 Initial pressure head : [m]
 Initial discharge : 500.0 [l/s]
 Initial relative frequency : [%]
 Speed-Torque char. of motor : Table
 Polar moment of inertia : 30.00 [kgm2]
 Drive type : Trip
 Trip time : 0.000 [s]
 Action table speed : Table
 Action table motorfreq. : Table
 Minimum speed for tripping : 20.00 [rpm]
 Minimum rel.freq. for tripping: [%]
 Required speed : [rpm]
 Minimum speed : [rpm]
 Maximum speed : [rpm]
 Maximum power : [kW]
 Level ON : [m]
 Level OFF : [m]
 Start time (0 to max) : [s]
 Stop time (max to 0) : [s]

PUMP

P7

Model name:

Comment :
 Keywords :
 Reference Id : KSB Omega 300-700 A
 Characteristic type : QHE
 QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60
350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

QHE_table : Table

Discharge	Efficiency
[l/s]	[%]
0.0000	0.0000
250.00	74.000
350.00	82.000
390.00	84.000
500.00	84.500
565.00	84.000
600.00	82.000
655.00	78.000
700.00	74.000
750.00	70.000

Suter : Table

Suter : Table

Rated speed : 1450. [rpm]

Q in best point of eff. : [l/s]

H in best point of eff. : [m]

T in best point of eff. : [kNm]

Initial setting : Discharge

Initial speed : [rpm]

Initial suction head : [m]

Initial pressure head : [m]

Initial discharge : 500.0 [l/s]

Initial relative frequency : [%]

Speed-Torque char. of motor : Table

Polar moment of inertia : 30.00 [kgm2]

Drive type : Trip

Trip time : 0.000 [s]

Action table speed : Table

Action table motorfreq. : Table

Minimum speed for tripping : 20.00 [rpm]

Minimum rel.freq. for tripping: [%]

Required speed : [rpm]

Minimum speed : [rpm]

Maximum speed : [rpm]

Maximum power : [kW]

Level ON : [m]

Level OFF : [m]

Start time (0 to max) : [s]

Stop time (max to 0) : [s]

PUMP

P8

Model name:

Comment :

Keywords :

Reference Id : KSB Omega 300-700 A

Characteristic type : QHE

QHE_table : Table

Discharge	Pump head
[l/s]	[m]
0.0000	170.00
250.00	159.60

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

350.00	150.00
390.00	146.00
500.00	134.00
565.00	125.00
600.00	120.00
655.00	110.00
700.00	100.00
750.00	88.000

QHE_table	:	Table	
		Discharge	Efficiency
		[l/s]	[%]
		0.0000	0.0000
		250.00	74.000
		350.00	82.000
		390.00	84.000
		500.00	84.500
		565.00	84.000
		600.00	82.000
		655.00	78.000
		700.00	74.000
		750.00	70.000

Suter	:	Table	
Suter	:	Table	
Rated speed	:	1450.	[rpm]
Q in best point of eff.	:		[l/s]
H in best point of eff.	:		[m]
T in best point of eff.	:		[kNm]
Initial setting	:	Speed	
Initial speed	:	0.000	[rpm]
Initial suction head	:		[m]
Initial pressure head	:		[m]
Initial discharge	:	500.0	[l/s]
Initial relative frequency	:		[%]
Speed-Torque char. of motor	:	Table	
Polar moment of inertia	:	30.00	[kgm2]
Drive type	:	Trip	
Trip time	:	0.000	[s]
Action table speed	:	Table	
Action table motorfreq.	:	Table	
Minimum speed for tripping	:	20.00	[rpm]
Minimum rel.freq. for tripping:	:		[%]
Required speed	:		[rpm]
Minimum speed	:		[rpm]
Maximum speed	:		[rpm]
Maximum power	:		[kW]
Level ON	:		[m]
Level OFF	:		[m]
Start time (0 to max)	:		[s]
Stop time (max to 0)	:		[s]

VALVE 200 BV1 Universal Model name: SMS 700 BV
Comment :

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Keywords :
Reference Id :
Characteristic type : Standard
Standard type : Gate
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.800	499.80
24.300	2408.8
57.900	7840.0
77.800	16125.
84.400	19600.
100.00	29380.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 150.0 [mm]
Initial setting : Position
Initial position (open) : 50.00 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE 200 BV6 Universal Model name: SMS 700 BV
Comment :
Keywords :
Reference Id :
Characteristic type : Standard
Standard type : Gate
Kv Characteristic : Table

Position open	Kv

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.800	499.80
24.300	2408.8
57.900	7840.0
77.800	16125.
84.400	19600.
100.00	29380.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 150.0 [mm]
Initial setting : Position
Initial position (open) : 50.00 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE 600 BV1 Universal Model name: SMS 600 BV

Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Gate
Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE 600 BV2 Universal Model name: SMS 600 BV

Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Gate
Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE 600 BV3 Universal Model name: SMS 600 BV

Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Gate
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000
60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE 600 BV5 Universal Model name: SMS 600 BV
 Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Gate
 Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.10000E+07
2.5000	2000.0
5.0000	900.00
10.000	390.00
20.000	130.00
30.000	43.000
40.000	17.000
50.000	6.7000

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

60.000	2.8000
70.000	1.3000
80.000	0.55000
90.000	0.30000
94.000	0.27000
97.000	0.24000
100.00	0.23500

Inner diameter	:	600.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	100.0	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]
Initial discharge	:		[l/s]
Initial upstream pressure	:		[barg]
Initial downstream pressure	:		[barg]
Check cavitation	:	No	
Cavitation table	:	Table	

VALVE	EV1	Universal	Model name:
	Comment	:	
	Keywords	:	
	Reference Id	:	
	Characteristic type	:	Kv
	Standard type	:	Buttrfly
	Kv Characteristic	:	Table
		Position open	Kv
		[%]	[m3/h/(bar)½]
		0.0000	0.0000
		9.1600	2089.7
		29.600	3678.4
		49.300	14351.
		66.600	32029.
		69.400	36300.
		84.500	60500.
		100.00	96800.
	Cv Characteristic	:	Table
	Xi Characteristic	:	Table
		Position open	Xi
		[%]	[-]
		0.0000	0.15740E+07
		2.5000	3404.0
		5.0000	1532.0
		10.000	663.80
		20.000	221.27
		30.000	73.200
		40.000	28.933
		50.000	11.407
		60.000	4.7660
		70.000	2.2127
		80.000	0.93600
		90.000	0.51067
		94.000	0.45960

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

97.000 0.40853
100.00 0.40000

Inner diameter : 1100. [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV10 Universal Model name:

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE

EV2 Universal

Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Check cavitation : No
Cavitation table : Table

VALVE EV3 Universal Model name:

Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV4 Universal Model name:
Comment :

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV5 Universal Model name:
Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV6 Universal Model name:
Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
9.1600	2089.7
29.600	3678.4

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

49.300	14351.
66.600	32029.
69.400	36300.
84.500	60500.
100.00	96800.

Cv Characteristic : Table

Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 1100. [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE EV7 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open [%]	Kv [m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE EV8 Universal Model name:

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200
40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE EV9 Universal Model name:
Comment :
Keywords :
Reference Id :
Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.700	392.00
27.800	2000.0
44.400	4713.0
63.100	10000.
77.700	16000.
90.900	24000.
100.00	32610.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.15740E+07
2.5000	3404.0
5.0000	1532.0
10.000	663.80
20.000	221.27
30.000	73.200

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

40.000	28.933
50.000	11.407
60.000	4.7660
70.000	2.2127
80.000	0.93600
90.000	0.51067
94.000	0.45960
97.000	0.40853
100.00	0.40000

Inner diameter : 700.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 600 BV Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :

Characteristic type : Kv
 Standard type : Butterfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter	:	600.0	[mm]
Initial setting	:	Position	
Initial position (open)	:	100.0	[%]
Initial upstream head	:		[m]
Initial downstream head	:		[m]
Initial discharge	:		[l/s]
Initial upstream pressure	:		[barg]
Initial downstream pressure	:		[barg]
Check cavitation	:	No	
Cavitation table	:	Table	

VALVE SMS 601 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar) ^{1/2}]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter	:	600.0	[mm]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

VALVE SMS 602 Universal Model name: SMS 600

Comment :
Keywords :
Reference Id :

Characteristic type : Kv
Standard type : Buttrfly
Kv Characteristic : Table

Position open [%]	Kv [m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

VALVE SMS 603 Universal Model name: SMS 600

Comment :
 Keywords :
 Reference Id :
 Characteristic type : Kv
 Standard type : Buttrfly
 Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table
 Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
 Initial setting : Position
 Initial position (open) : 100.0 [%]
 Initial upstream head : [m]
 Initial downstream head : [m]
 Initial discharge : [l/s]
 Initial upstream pressure : [barg]
 Initial downstream pressure : [barg]
 Check cavitation : No
 Cavitation table : Table

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

VALVE SMS 604 Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE SMS 605 Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

Standard type : Buttrfly

Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE SMS 606 Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Buttrfly

Kv Characteristic : Table

Position open	Kv
[%]	[m3/h/(bar)½]
0.0000	0.0000

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.
88.900	16000.
100.00	22000.

Cv Characteristic : Table

Xi Characteristic : Table

Position open	Xi
[%]	[-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]

Initial setting : Position

Initial position (open) : 100.0 [%]

Initial upstream head : [m]

Initial downstream head : [m]

Initial discharge : [l/s]

Initial upstream pressure : [barg]

Initial downstream pressure : [barg]

Check cavitation : No

Cavitation table : Table

VALVE SMS 607 Universal Model name: SMS 600

Comment :

Keywords :

Reference Id :

Characteristic type : Kv

Standard type : Butterfly

Kv Characteristic : Table

Position open	Kv
[%]	[m ³ /h/(bar) ^½]
0.0000	0.0000
10.800	315.00
32.000	1573.0
52.100	4720.0
66.700	8260.0
73.100	10000.

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

88.900 16000.
100.00 22000.

Cv Characteristic : Table
Xi Characteristic : Table

Position open [%]	Xi [-]
0.0000	0.19150E+07
2.5000	3830.0
5.0000	1723.0
10.000	746.80
20.000	248.90
30.000	82.340
40.000	32.550
50.000	12.830
60.000	5.3620
70.000	2.4890
80.000	1.0530
90.000	0.57450
94.000	0.51700
97.000	0.45960
100.00	0.45000

Inner diameter : 600.0 [mm]
Initial setting : Position
Initial position (open) : 100.0 [%]
Initial upstream head : [m]
Initial downstream head : [m]
Initial discharge : [l/s]
Initial upstream pressure : [barg]
Initial downstream pressure : [barg]
Check cavitation : No
Cavitation table : Table

Calculated pipe data:

=====

PIPE		length [m]	C_calc [m/s]	C_adapt [m/s]	N_elem [-]
PIPE	1100 B.	23.150	1025.	772.	1
PIPE	1101	51.700	1025.	862.	2
PIPE	BASMA BORUSU-1	3679.934	1033.	1031.	119
PIPE	BASMA BORUSU-2	467.344	1033.	1039.	15
PIPE	BASMA BORUSU-3	1550.225	1033.	1033.	50
PRIGID	KOL1	4.250	used as rigid column		
PRIGID	KOL10	15.200	used as rigid column		
PRIGID	KOL11	7.100	used as rigid column		
PRIGID	KOL110	15.200	used as rigid column		
PRIGID	KOL111	7.100	used as rigid column		
PRIGID	KOL112	15.200	used as rigid column		
PRIGID	KOL113	7.100	used as rigid column		
PRIGID	KOL114	15.200	used as rigid column		
PIPE	KOL115	49.520	1025.	825.	2

3.1.5 INPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wir

PRIGID	KOL12	15.200	used as rigid column
PRIGID	KOL13	7.100	used as rigid column
PRIGID	KOL14	15.200	used as rigid column
PIPE	KOL15	25.380	1025. 846. 1
PRIGID	KOL16	4.250	used as rigid column
PRIGID	KOL17	4.250	used as rigid column
PRIGID	KOL18	4.250	used as rigid column
PRIGID	KOL19	7.100	used as rigid column
PRIGID	KOL2	4.250	used as rigid column
PRIGID	KOL20	15.200	used as rigid column
PRIGID	KOL21	4.250	used as rigid column
PRIGID	KOL22	4.250	used as rigid column
PRIGID	KOL23	4.250	used as rigid column
PRIGID	KOL24	7.100	used as rigid column
PRIGID	KOL3	4.250	used as rigid column
PRIGID	KOL4	7.100	used as rigid column
PRIGID	KOL5	15.200	used as rigid column
PRIGID	KOL6	4.250	used as rigid column
PRIGID	KOL7	4.250	used as rigid column
PRIGID	KOL8	4.250	used as rigid column
PRIGID	KOL9	7.100	used as rigid column
PIPE	Mevcut Boru	527.655	1013. 1035. 17
PRIGID	P-BYP	4.000	used as rigid column
PRIGID	P-BYP.a	4.000	used as rigid column
PRIGID	P-CON	10.300	used as rigid column
PRIGID	P-CON.a	10.300	used as rigid column
PRIGID	P-CON.b	10.300	used as rigid column
PRIGID	P-CON.c	10.300	used as rigid column
PIPE	Yeni Boru	317.353	1033. 1058. 10
PIPE	Yeni Boru.a	57.496	1033. 958. 2

Active H-components:

=====

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor
== WANDA Transient 3.60 ===

Licensee: Calisan Engineering Consulting Services
date: 07-07-2017
time: 11:47:32

Case : 3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17

Title: 3.1.5 K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17

Case description:
=====

3.1.4 K.MARAS 1.KD+2.KD-KAZANLI-03 JUL 17

Steady state results:

Pipes:

Name v [m/s]	length [m]	lambda [-]	wall rough. [mm]	c_calc [m/s]	c_adapt [m/s]	N_elem [-]	Q [l/s]
1100 B. 1.578	23.15	0.0420	0.150	1024.70	771.67	1	1500.000
1101 1.578	51.70	0.0262	0.150	1024.70	861.67	2	1500.000
BASMA BORUSU-1 1.334	3679.93	0.0149	0.150	1033.29	1030.79	119	3000.000
BASMA BORUSU-2 1.334	467.34	0.0157	0.150	1033.29	1038.54	15	3000.000
BASMA BORUSU-3 1.334	1550.22	0.0140	0.150	1033.29	1033.48	50	3000.000
KOL115 1.578	49.52	0.0201	0.150	1024.70	825.33	2	1500.000
KOL15 1.578	25.38	0.0265	0.150	1024.70	846.00	1	1500.000
Mevcut Boru 1.709	527.65	0.0170	0.150	1013.25	1034.62	17	3000.000
Yeni Boru 1.334	317.35	0.0158	0.150	1033.29	1057.84	10	3000.000
Yeni Boru.a 1.334	57.50	0.0249	0.150	1033.29	958.26	2	3000.000

Discharges and velocities through H-components:

H-component	discharge [l/s]	velocity [m/s]

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

AIRVva	A1	0.000	
AIRVva	A2	0.000	
AIRVvn	A1	0.000	
AIRVvn	A2	0.000	
BOUNDH	ARITMA G.	-3000.000	
BOUNDH	MENZELET BRJ	3000.000	
CHECKV	C1	500.000	1.768
CHECKV	C10	0.000	
CHECKV	C2	500.000	1.768
CHECKV	C3	500.000	1.768
CHECKV	C4	0.000	
CHECKV	C5	500.000	1.768
CHECKV	C6	500.000	1.768
CHECKV	C7	500.000	1.768
CHECKV	C8	0.000	
CHECKV	C9	0.000	
PRIGID	KOL1	1000.000	1.052
PRIGID	KOL10	500.000	1.768
PRIGID	KOL11	500.000	1.299
PRIGID	KOL110	500.000	1.768
PRIGID	KOL111	500.000	1.299
PRIGID	KOL112	500.000	1.768
PRIGID	KOL113	0.000	
PRIGID	KOL114	0.000	
PRIGID	KOL12	500.000	1.768
PRIGID	KOL13	0.000	
PRIGID	KOL14	0.000	
PRIGID	KOL16	1000.000	1.052
PRIGID	KOL17	500.000	0.526
PRIGID	KOL18	0.000	
PRIGID	KOL19	500.000	1.299
PRIGID	KOL2	500.000	0.526
PRIGID	KOL20	500.000	1.768
PRIGID	KOL21	500.000	0.526
PRIGID	KOL22	1000.000	1.052
PRIGID	KOL23	1500.000	1.578
PRIGID	KOL24	500.000	1.299
PRIGID	KOL3	0.000	
PRIGID	KOL4	500.000	1.299
PRIGID	KOL5	500.000	1.768
PRIGID	KOL6	500.000	0.526
PRIGID	KOL7	1000.000	1.052
PRIGID	KOL8	1500.000	1.578
PRIGID	KOL9	500.000	1.299
PRIGID	P-BYP	0.000	
PRIGID	P-BYP.a	0.000	
PRIGID	P-CON	0.000	
PRIGID	P-CON.a	0.000	
PRIGID	P-CON.b	0.000	
PRIGID	P-CON.c	0.000	
PUMP	P1	500.000	
PUMP	P2	500.000	

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

PUMP	P3	500.000	
PUMP	P4	0.000	
PUMP	P5	500.000	
PUMP	P6	500.000	
PUMP	P7	500.000	
PUMP	P8	0.000	
VALVE	200 BV1	0.000	
VALVE	200 BV6	0.000	
VALVE	600 BV1	0.000	
VALVE	600 BV2	0.000	
VALVE	600 BV3	0.000	
VALVE	600 BV5	0.000	
VALVE	EV1	1500.000	1.578
VALVE	EV10	0.000	
VALVE	EV2	500.000	1.299
VALVE	EV3	500.000	1.299
VALVE	EV4	500.000	1.299
VALVE	EV5	0.000	
VALVE	EV6	1500.000	1.578
VALVE	EV7	500.000	1.299
VALVE	EV8	500.000	1.299
VALVE	EV9	500.000	1.299
VALVE	SMS 600 BV	500.000	1.768
VALVE	SMS 601	500.000	1.768
VALVE	SMS 602	500.000	1.768
VALVE	SMS 603	0.000	
VALVE	SMS 604	500.000	1.768
VALVE	SMS 605	500.000	1.768
VALVE	SMS 606	500.000	1.768
VALVE	SMS 607	0.000	

Pressures and heads in H-nodes:

H-node	pressure [barg]	head [m]
□	6.22	607.731
A	5.78	609.000
AA	6.21	607.594
AA.a	6.21	607.550
AB	6.21	607.594
AB.a	6.21	607.550
AC	12.00	666.583
AC.a	12.00	666.620
AC.b	11.99	666.505
AC.c	11.99	666.505
AD	12.00	666.583
AD.a	12.00	666.620
AD.b	11.99	666.505
AD.c	11.99	666.505
AE	6.21	607.594
AE.a	6.21	607.550

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

AE.b	11.76	666.505
AE.c	6.00	607.763
AE.d	6.00	607.763
AE.e	11.76	666.505
AF	12.00	666.583
AF.a	12.00	666.620
AF.b	11.99	666.505
AF.c	11.99	666.505
AG	11.99	666.505
AH	6.21	607.575
AI	6.21	607.555
AJ	6.21	607.550
AK	12.01	666.685
AL	12.00	666.665
AM	6.19	607.438
AN	6.19	607.407
AO	12.07	667.304
AP	12.04	667.049
AQ	12.04	666.981
AR	12.01	666.690
AS	6.19	607.418
AT	6.19	607.387
AU	12.07	667.299
AV	12.04	667.044
AW	12.03	666.976
AX	6.19	607.413
AY	6.19	607.382
AZ	12.06	667.279
B	5.91	608.109
BA	12.04	667.024
BB	12.03	666.956
BC	6.21	607.550
BD	4.27	663.557
BE	3.23	663.164
BF	0.40	662.000
BG	6.23	607.763
BG.a	6.23	607.763
BH	6.23	607.763
C	6.02	607.840
D	6.21	607.619
E	6.21	607.599
F	6.21	607.594
G	6.22	607.731
H	12.00	666.648
I	12.00	666.628
J	6.20	607.482
K	6.20	607.451
L	12.06	667.267
M	12.04	667.012
N	12.03	666.943
O	12.00	666.653
P	6.20	607.462

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

Q	6.19	607.431
R	12.06	667.262
S	12.04	667.007
T	12.03	666.938
U	6.20	607.457
V	6.19	607.426
W	12.06	667.242
X	12.04	666.987
Y	12.03	666.918
Z	6.21	607.594

Additional H-component output:

AIRVva	A1	Fluid level	551.656	[m]
		Air pressure	5.504	[barg]
AIRVva	A2	Fluid level	551.656	[m]
		Air pressure	5.504	[barg]
AIRVvn	A1	Fluid level	549.674	[m]
		Air pressure	11.461	[barg]
		Air volume	13.000	[m3]
AIRVvn	A2	Fluid level	549.674	[m]
		Air pressure	11.461	[barg]
		Air volume	13.000	[m3]
PUMP	P1	Pump speed	1084.290	[rpm]
		Fluid torque	3.361	[kNm]
		Motor torque	3.361	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	76.869	[%]
		Power	381.678	[kW]
		Energy	0.000	[kJ]
PUMP	P2	Pump speed	1084.370	[rpm]
		Fluid torque	3.362	[kNm]
		Motor torque	3.362	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	76.874	[%]
		Power	381.752	[kW]
		Energy	0.000	[kJ]
PUMP	P3	Pump speed	1084.290	[rpm]
		Fluid torque	3.361	[kNm]
		Motor torque	3.361	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	76.870	[%]
		Power	381.678	[kW]
		Energy	0.000	[kJ]
PUMP	P4	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	76.870	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
PUMP	P5	Pump speed	1084.728	[rpm]

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

		Fluid torque	3.364	[kNm]
		Motor torque	3.364	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	76.893	[%]
		Power	382.086	[kW]
		Energy	0.000	[kJ]
PUMP	P6	Pump speed	1084.808	[rpm]
		Fluid torque	3.364	[kNm]
		Motor torque	3.364	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	76.897	[%]
		Power	382.160	[kW]
		Energy	0.000	[kJ]
PUMP	P7	Pump speed	1084.728	[rpm]
		Fluid torque	3.364	[kNm]
		Motor torque	3.364	[kNm]
		ON/OFF	1.000	[-]
		Efficiency	76.893	[%]
		Power	382.086	[kW]
		Energy	0.000	[kJ]
PUMP	P8	Pump speed	0.000	[rpm]
		Fluid torque	0.000	[kNm]
		Motor torque	0.000	[kNm]
		ON/OFF	0.000	[-]
		Efficiency	76.893	[%]
		Power	0.000	[kW]
		Energy	0.000	[kJ]
VALVE	200 BV1	Valve position (open)	50.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	200 BV6	Valve position (open)	50.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV1	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV2	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV3	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	600 BV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV1	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV10	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV2	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV3	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV4	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV5	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV6	Valve position (open)	100.000	[%]

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

		Pressure ratio Xf	0.000	[-]
VALVE	EV7	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV8	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	EV9	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	SMS 600 BV	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 601	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 602	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 603	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]
VALVE	SMS 604	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 605	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 606	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.001	[-]
VALVE	SMS 607	Valve position (open)	100.000	[%]
		Pressure ratio Xf	0.000	[-]

Extreme values in pipes:

Head:

Pipe location	minimum [m]	time [s]	location [m]	maximum [m]	time [s]	[m]
1100 B. 0.00	596.643	12.150	23.15	657.723	2.580	
1101 0.00	596.446	12.180	51.70	657.728	2.580	
BASMA BORUSU-1 61.85	599.217	14.940	0.00	683.252	33.420	
BASMA BORUSU-2 0.00	633.642	18.540	0.00	676.253	29.910	
BASMA BORUSU-3 0.00	638.053	18.090	0.00	673.771	29.460	
KOL115 0.00	599.005	13.200	0.00	683.522	33.540	
KOL15 0.00	599.217	14.940	25.38	683.345	33.480	
Mevcut Boru 527.65	597.347	12.270	527.65	646.798	2.520	
Yeni Boru 317.35	596.389	12.060	285.62	656.703	2.580	
Yeni Boru.a 57.50	596.397	12.060	0.00	657.738	2.580	

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

Pressure:

Pipe location [m]	minimum [barg]	time [s]	location [m]	maximum [barg]	time [s]
1100 B. 0.00	5.140	12.150	23.15	11.132	2.580
1101 0.00	5.120	12.180	51.70	11.132	2.580
BASMA BORUSU-1 896.79	1.337	18.540	3679.93	15.567	32.610
BASMA BORUSU-2 280.41	0.772	18.090	467.34	6.010	29.640
BASMA BORUSU-3 248.04	0.166	5.610	1488.22	4.548	29.220
KOL115 0.00	5.371	13.200	0.00	13.663	33.540
KOL15 0.00	5.392	14.940	25.38	13.645	33.480
Mevcut Boru 527.65	4.861	12.270	527.65	9.712	2.520
Yeni Boru 317.35	4.843	12.150	158.68	10.816	2.580
Yeni Boru.a 57.50	4.900	12.060	0.00	11.133	2.580

Cavitation volumes:

Pipe	maximum [-]	time [s]	location [m]
1100 B.	0.000	0.000	0.00
1101	0.000	0.000	0.00
BASMA BORUSU-1	0.000	0.000	0.00
BASMA BORUSU-2	0.000	0.000	0.00
BASMA BORUSU-3	0.000	0.000	0.00
KOL115	0.000	0.000	0.00
KOL15	0.000	0.000	0.00
Mevcut Boru	0.000	0.000	0.00
Yeni Boru	0.000	0.000	0.00
Yeni Boru.a	0.000	0.000	0.00

Extreme discharges through H-components:

H-component	minimum [l/s]	time [s]	maximum [l/s]	time [s]
AIRVva A1	-1100.995	1.260	474.286	3.870
AIRVva A2	-1100.995	1.260	474.286	3.870

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

AIRVvn	A1	-351.848	28.890	1198.006	1.380
AIRVvn	A2	-351.848	28.890	1198.006	1.380
BOUNDH	ARITMA G.	-3000.028	2.160	1157.492	27.960
BOUNDH	MENZELET BRJ	-732.535	8.430	3000.005	0.720
CHECKV	C1	0.000	5.880	500.000	0.000
CHECKV	C10	0.000	0.000	1157.244	1.380
CHECKV	C2	0.000	5.400	500.000	0.000
CHECKV	C3	0.000	5.370	500.000	0.000
CHECKV	C4	0.000	0.090	182.712	3.090
CHECKV	C5	0.000	6.180	500.000	0.000
CHECKV	C6	0.000	6.150	500.000	0.000
CHECKV	C7	0.000	6.120	500.000	0.000
CHECKV	C8	0.000	0.060	164.867	3.300
CHECKV	C9	0.000	21.210	1157.244	1.380
PRIGID	KOL1	0.000	82.740	1000.000	0.000
PRIGID	KOL10	0.000	5.400	500.000	0.000
PRIGID	KOL11	0.000	5.370	500.000	0.000
PRIGID	KOL110	0.000	6.150	500.000	0.000
PRIGID	KOL111	0.000	32.790	500.000	0.000
PRIGID	KOL112	0.000	6.120	500.000	0.000
PRIGID	KOL113	0.000	78.330	164.867	3.300
PRIGID	KOL114	0.000	0.000	164.867	3.300
PRIGID	KOL12	0.000	5.370	500.000	0.000
PRIGID	KOL13	0.000	82.740	182.712	3.090
PRIGID	KOL14	0.000	0.000	182.712	3.090
PRIGID	KOL16	0.000	79.710	1000.000	0.000
PRIGID	KOL17	0.000	78.330	500.000	0.000
PRIGID	KOL18	0.000	78.330	164.867	3.300
PRIGID	KOL19	0.000	33.780	500.000	0.000
PRIGID	KOL2	0.000	82.740	500.000	0.000
PRIGID	KOL20	0.000	6.120	500.000	0.000
PRIGID	KOL21	0.000	6.120	500.000	0.000
PRIGID	KOL22	0.000	6.720	1000.000	0.000
PRIGID	KOL23	0.000	6.420	1500.000	0.000
PRIGID	KOL24	0.000	9.120	500.000	0.000
PRIGID	KOL3	0.000	83.070	182.712	3.090
PRIGID	KOL4	0.000	36.330	500.000	0.000
PRIGID	KOL5	0.000	5.370	500.000	0.000
PRIGID	KOL6	0.000	5.370	500.000	0.000
PRIGID	KOL7	0.000	5.790	1000.000	0.000
PRIGID	KOL8	0.000	6.780	1500.000	0.000
PRIGID	KOL9	0.000	40.920	500.000	0.000
PRIGID	P-BYP	-44.456	1.650	351.848	28.890
PRIGID	P-BYP.a	-44.456	1.650	351.848	28.890
PRIGID	P-CON	-1198.006	1.380	351.848	28.890
PRIGID	P-CON.a	-474.286	3.870	1100.995	1.260
PRIGID	P-CON.b	-474.286	3.870	1100.995	1.260
PRIGID	P-CON.c	-1198.006	1.380	351.848	28.890
PUMP	P1	0.000	9.240	500.000	0.000
PUMP	P2	0.000	5.400	500.000	0.000
PUMP	P3	0.000	5.370	500.000	0.000
PUMP	P4	0.000	89.250	182.712	3.090

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

PUMP	P5	0.000	8.880	500.000	0.000
PUMP	P6	0.000	6.150	500.000	0.000
PUMP	P7	0.000	6.120	500.000	0.000
PUMP	P8	0.000	89.790	164.867	3.300
VALVE	200 BV1	-351.848	28.890	44.456	1.650
VALVE	200 BV6	-351.848	28.890	44.456	1.650
VALVE	600 BV1	-1100.995	1.260	474.286	3.870
VALVE	600 BV2	-1100.995	1.260	474.286	3.870
VALVE	600 BV3	-351.848	28.890	1198.006	1.380
VALVE	600 BV5	-351.848	28.890	1198.006	1.380
VALVE	EV1	-10.830	5.400	1500.000	0.000
VALVE	EV10	0.000	79.710	164.867	3.300
VALVE	EV2	0.000	9.240	500.000	0.000
VALVE	EV3	0.000	5.400	500.000	0.000
VALVE	EV4	0.000	5.370	500.000	0.000
VALVE	EV5	0.000	82.740	182.712	3.090
VALVE	EV6	-21.006	22.440	1505.912	0.060
VALVE	EV7	0.000	8.880	500.000	0.000
VALVE	EV8	0.000	6.150	500.000	0.000
VALVE	EV9	0.000	6.120	500.000	0.000
VALVE	SMS 600 BV	0.000	5.370	500.000	0.000
VALVE	SMS 601	0.000	5.400	500.000	0.000
VALVE	SMS 602	0.000	5.370	500.000	0.000
VALVE	SMS 603	0.000	0.090	182.712	3.090
VALVE	SMS 604	0.000	6.120	500.000	0.000
VALVE	SMS 605	0.000	6.150	500.000	0.000
VALVE	SMS 606	0.000	6.120	500.000	0.000
VALVE	SMS 607	0.000	0.060	164.867	3.300

Extreme pressure heads in H-nodes:

H-node	minimum [m]	time [s]	maximum [m]	time [s]
□	596.663	12.120	657.728	2.580
A	609.000	0.000	609.000	0.000
AA	596.643	12.150	655.706	2.730
AA.a	596.446	12.180	653.830	2.700
AB	596.839	12.150	653.570	2.370
AB.a	596.606	12.180	653.307	2.430
AC	599.548	13.170	683.345	33.480
AC.a	599.005	13.200	683.522	33.540
AC.b	599.219	14.940	683.066	33.480
AC.c	599.219	14.940	683.066	33.480
AD	599.548	13.170	683.345	33.480
AD.a	599.005	13.200	683.522	33.540
AD.b	598.375	16.020	667.061	71.160
AD.c	598.375	16.020	667.061	71.160
AE	596.643	12.150	656.167	2.700
AE.a	596.446	12.180	654.435	2.700
AE.b	598.046	15.240	667.082	72.000
AE.c	596.826	11.700	660.756	2.460

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

AE.d	596.826	11.700	660.756	2.460
AE.e	598.046	15.240	667.082	72.000
AF	599.548	13.170	683.345	33.480
AF.a	599.005	13.200	683.522	33.540
AF.b	599.285	14.940	667.133	71.160
AF.c	599.285	14.940	667.133	71.160
AG	599.217	14.940	683.099	33.480
AH	596.446	12.180	654.946	2.700
AI	596.446	12.180	654.750	2.700
AJ	596.446	12.180	654.581	2.700
AK	599.005	13.200	683.522	33.540
AL	599.005	13.200	683.522	33.540
AM	596.446	12.180	654.817	2.700
AN	596.446	12.180	654.808	2.700
AO	597.360	12.180	667.304	0.000
AP	599.005	13.200	683.522	33.540
AQ	599.005	13.200	683.522	33.540
AR	599.005	13.200	683.522	33.540
AS	596.446	12.180	654.619	2.700
AT	596.446	12.180	654.610	2.700
AU	597.359	12.180	667.299	0.000
AV	599.005	13.200	683.522	33.540
AW	599.005	13.200	683.522	33.540
AX	596.446	12.180	654.454	2.700
AY	596.446	12.180	654.445	2.700
AZ	597.359	12.180	667.279	0.000
B	597.347	12.270	646.798	2.520
BA	599.005	13.200	683.522	33.540
BB	599.005	13.200	683.522	33.540
BC	596.446	12.180	653.831	2.700
BD	633.642	18.540	676.253	29.910
BE	638.053	18.090	673.771	29.460
BF	662.000	0.000	662.000	0.000
BG	596.663	12.120	657.740	2.580
BG.a	596.663	12.120	657.740	2.580
BH	596.663	12.120	657.738	2.580
C	596.397	12.060	656.703	2.580
D	596.643	12.150	656.589	2.670
E	596.643	12.150	656.418	2.670
F	596.643	12.150	656.276	2.700
G	596.663	12.120	657.723	2.580
H	599.548	13.170	683.345	33.480
I	599.548	13.170	683.345	33.480
J	596.643	12.150	656.469	2.670
K	596.643	12.150	656.458	2.670
L	597.621	12.150	667.267	0.000
M	599.548	13.170	683.345	33.480
N	599.548	13.170	683.345	33.480
O	599.548	13.170	683.345	33.480
P	596.643	12.150	656.293	2.670
Q	596.643	12.150	656.281	2.670
R	597.620	12.150	667.262	0.000

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

S	599.548	13.170	683.345	33.480
T	599.548	13.170	683.345	33.480
U	596.643	12.150	656.159	2.700
V	596.643	12.150	656.147	2.700
W	597.620	12.150	667.242	0.000
X	599.548	13.170	683.345	33.480
Y	599.548	13.170	683.345	33.480
Z	596.643	12.150	655.709	2.730

Extreme pressures in H-nodes:

H-node	minimum [barg]	time [s]	maximum [barg]	time [s]
□	5.142	12.120	11.132	2.580
A	5.788	0.000	5.788	0.000
AA	5.140	12.150	10.934	2.730
AA.a	5.120	12.180	10.750	2.700
AB	5.159	12.150	10.724	2.370
AB.a	5.136	12.180	10.699	2.430
AC	5.425	13.170	13.645	33.480
AC.a	5.371	13.200	13.663	33.540
AC.b	5.392	14.940	13.618	33.480
AC.c	5.392	14.940	13.618	33.480
AD	5.425	13.170	13.645	33.480
AD.a	5.371	13.200	13.663	33.540
AD.b	5.310	16.020	12.048	71.160
AD.c	5.310	16.020	12.048	71.160
AE	5.140	12.150	10.979	2.700
AE.a	5.120	12.180	10.809	2.700
AE.b	5.052	15.240	11.824	72.000
AE.c	4.932	11.700	11.204	2.460
AE.d	4.932	11.700	11.204	2.460
AE.e	5.052	15.240	11.824	72.000
AF	5.425	13.170	13.645	33.480
AF.a	5.371	13.200	13.663	33.540
AF.b	5.399	14.940	12.055	71.160
AF.c	5.399	14.940	12.055	71.160
AG	5.392	14.940	13.621	33.480
AH	5.120	12.180	10.859	2.700
AI	5.120	12.180	10.840	2.700
AJ	5.120	12.180	10.823	2.700
AK	5.371	13.200	13.663	33.540
AL	5.371	13.200	13.663	33.540
AM	5.120	12.180	10.847	2.700
AN	5.120	12.180	10.846	2.700
AO	5.210	12.180	12.072	0.000
AP	5.371	13.200	13.663	33.540
AQ	5.371	13.200	13.663	33.540
AR	5.371	13.200	13.663	33.540
AS	5.120	12.180	10.827	2.700
AT	5.120	12.180	10.826	2.700

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

AU	5.210	12.180	12.071	0.000
AV	5.371	13.200	13.663	33.540
AW	5.371	13.200	13.663	33.540
AX	5.120	12.180	10.811	2.700
AY	5.120	12.180	10.810	2.700
AZ	5.210	12.180	12.069	0.000
B	4.861	12.270	9.712	2.520
BA	5.371	13.200	13.663	33.540
BB	5.371	13.200	13.663	33.540
BC	5.120	12.180	10.750	2.700
BD	1.337	18.540	5.517	29.910
BE	0.772	18.090	4.276	29.460
BF	0.407	0.000	0.407	0.000
BG	5.142	12.120	11.133	2.580
BG.a	5.142	12.120	11.133	2.580
BH	5.142	12.120	11.133	2.580
C	4.900	12.060	10.816	2.580
D	5.140	12.150	11.020	2.670
E	5.140	12.150	11.004	2.670
F	5.140	12.150	10.990	2.700
G	5.142	12.120	11.132	2.580
H	5.425	13.170	13.645	33.480
I	5.425	13.170	13.645	33.480
J	5.140	12.150	11.009	2.670
K	5.140	12.150	11.008	2.670
L	5.236	12.150	12.068	0.000
M	5.425	13.170	13.645	33.480
N	5.425	13.170	13.645	33.480
O	5.425	13.170	13.645	33.480
P	5.140	12.150	10.991	2.670
Q	5.140	12.150	10.990	2.670
R	5.236	12.150	12.067	0.000
S	5.425	13.170	13.645	33.480
T	5.425	13.170	13.645	33.480
U	5.140	12.150	10.978	2.700
V	5.140	12.150	10.977	2.700
W	5.236	12.150	12.065	0.000
X	5.425	13.170	13.645	33.480
Y	5.425	13.170	13.645	33.480
Z	5.140	12.150	10.934	2.730

Extreme values of additional H-component output:

H-component	minimum	time [s]	maximum	time [s]
AIRVva A1				
Fluid level [m]	551.513	11.670	552.000	2.460
Air pressure [barg]	5.459	11.700	11.683	2.460
AIRVva A2				
Fluid level [m]	551.513	11.670	552.000	2.460
Air pressure [barg]	5.459	11.700	11.683	2.460

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

AIRVvn	A1				
Fluid level [m]		547.254	15.210	549.683	71.490
Air pressure [barg]		4.983	15.240	11.517	72.000
Air volume [m3]		12.952	72.000	23.936	15.240
AIRVvn	A2				
Fluid level [m]		547.254	15.210	549.683	71.490
Air pressure [barg]		4.983	15.240	11.517	72.000
Air volume [m3]		12.952	72.000	23.936	15.240
PUMP	P1				
Pump speed [rpm]		18.051	90.000	1084.290	0.000
Fluid torque [kNm]		0.001	90.000	3.361	0.000
Motor torque [kNm]		0.000	0.030	3.361	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	76.869	0.000
Power [kW]		0.000	0.030	381.678	0.000
Energy [kJ]		0.000	0.000	11.450	0.030
PUMP	P2				
Pump speed [rpm]		18.038	90.000	1084.370	0.000
Fluid torque [kNm]		0.001	90.000	3.362	0.000
Motor torque [kNm]		0.000	0.030	3.362	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	76.874	0.000
Power [kW]		0.000	0.030	381.752	0.000
Energy [kJ]		0.000	0.000	11.453	0.030
PUMP	P3				
Pump speed [rpm]		18.037	90.000	1084.290	0.000
Fluid torque [kNm]		0.001	90.000	3.361	0.000
Motor torque [kNm]		0.000	0.030	3.361	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	76.870	0.000
Power [kW]		0.000	0.030	381.678	0.000
Energy [kJ]		0.000	0.000	11.450	0.030
PUMP	P4				
Pump speed [rpm]		0.000	0.000	63.602	4.080
Fluid torque [kNm]		-0.214	2.970	0.013	4.320
Motor torque [kNm]		0.000	0.000	0.000	0.000
ON/OFF [-]		0.000	0.000	0.000	0.000
Efficiency [%]		0.000	0.030	76.870	0.000
Power [kW]		0.000	0.000	0.000	0.000
Energy [kJ]		0.000	0.000	0.000	0.000
PUMP	P5				
Pump speed [rpm]		17.770	90.000	1084.728	0.000
Fluid torque [kNm]		0.001	90.000	3.364	0.000
Motor torque [kNm]		0.000	0.030	3.364	0.000
ON/OFF [-]		0.000	0.030	1.000	0.000
Efficiency [%]		0.000	0.030	76.893	0.000
Power [kW]		0.000	0.030	382.086	0.000
Energy [kJ]		0.000	0.000	11.463	0.030
PUMP	P6				
Pump speed [rpm]		17.763	90.000	1084.808	0.000
Fluid torque [kNm]		0.001	90.000	3.364	0.000
Motor torque [kNm]		0.000	0.030	3.364	0.000

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	76.897	0.000
Power [kW]	0.000	0.030	382.160	0.000
Energy [kJ]	0.000	0.000	11.465	0.030
PUMP P7				
Pump speed [rpm]	17.761	90.000	1084.728	0.000
Fluid torque [kNm]	0.001	90.000	3.364	0.000
Motor torque [kNm]	0.000	0.030	3.364	0.000
ON/OFF [-]	0.000	0.030	1.000	0.000
Efficiency [%]	0.000	0.030	76.893	0.000
Power [kW]	0.000	0.030	382.086	0.000
Energy [kJ]	0.000	0.000	11.463	0.030
PUMP P8				
Pump speed [rpm]	0.000	0.000	55.397	4.380
Fluid torque [kNm]	-0.175	3.210	0.010	4.650
Motor torque [kNm]	0.000	0.000	0.000	0.000
ON/OFF [-]	0.000	0.000	0.000	0.000
Efficiency [%]	0.000	0.030	76.893	0.000
Power [kW]	0.000	0.000	0.000	0.000
Energy [kJ]	0.000	0.000	0.000	0.000
VALVE 200 BV1				
Valve position (open) [%]	50.000	0.000	50.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.008	6.510
VALVE 200 BV6				
Valve position (open) [%]	50.000	0.000	50.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.008	6.510
VALVE 600 BV1				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.001	3.870
VALVE 600 BV2				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.001	3.870
VALVE 600 BV3				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.003	6.180
VALVE 600 BV5				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.003	6.180
VALVE EV1				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.190	0.000	0.000
VALVE EV10				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	3.300
VALVE EV2				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.280	0.000	0.000
VALVE EV3				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.280	0.000	0.000
VALVE EV4				
Valve position (open) [%]	100.000	0.000	100.000	0.000

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

Pressure ratio Xf [-]	0.000	5.220	0.000	0.000
VALVE EV5				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	3.120
VALVE EV6				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.910	0.000	0.060
VALVE EV7				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.880	0.000	0.000
VALVE EV8				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.880	0.000	0.000
VALVE EV9				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.910	0.000	0.000
VALVE SMS 600 BV				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.340	0.001	0.030
VALVE SMS 601				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.310	0.001	0.030
VALVE SMS 602				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.280	0.001	0.000
VALVE SMS 603				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	3.120
VALVE SMS 604				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.880	0.001	0.000
VALVE SMS 605				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	6.000	0.001	0.030
VALVE SMS 606				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	5.940	0.001	0.000
VALVE SMS 607				
Valve position (open) [%]	100.000	0.000	100.000	0.000
Pressure ratio Xf [-]	0.000	0.000	0.000	3.330

Component messages:

At	0.0000	s	VALVE	EV1	Starts in open phase
At	0.0000	s	VALVE	EV6	Starts in open phase
At	0.0000	s	VALVE	600 BV2	Starts in open phase
At	0.0000	s	VALVE	600 BV1	Starts in open phase
At	0.0000	s	VALVE	EV2	Starts in open phase
At	0.0000	s	PUMP	P1	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 600 BV	Starts in open phase
At	0.0000	s	VALVE	EV3	Starts in open phase
At	0.0000	s	PUMP	P2	Pump specific speed = 26.0

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

At	0.0000	s	VALVE	SMS 601	Starts in open phase
At	0.0000	s	VALVE	EV4	Starts in open phase
At	0.0000	s	PUMP	P3	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 602	Starts in open phase
At	0.0000	s	VALVE	EV5	Starts in open phase
At	0.0000	s	PUMP	P4	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 603	Starts in open phase
At	0.0000	s	VALVE	600 BV5	Starts in open phase
At	0.0000	s	VALVE	600 BV3	Starts in open phase
At	0.0000	s	VALVE	200 BV1	Starts in open phase
At	0.0000	s	VALVE	200 BV6	Starts in open phase
At	0.0000	s	VALVE	EV7	Starts in open phase
At	0.0000	s	PUMP	P5	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 604	Starts in open phase
At	0.0000	s	VALVE	EV8	Starts in open phase
At	0.0000	s	PUMP	P6	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 605	Starts in open phase
At	0.0000	s	VALVE	EV9	Starts in open phase
At	0.0000	s	PUMP	P7	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 606	Starts in open phase
At	0.0000	s	VALVE	EV10	Starts in open phase
At	0.0000	s	PUMP	P8	Pump specific speed = 26.0
At	0.0000	s	VALVE	SMS 607	Starts in open phase
At	0.0000	s	PUMP	P1	Initial pump speed = 1084.290 [rpm]
At	0.0000	s	PUMP	P2	Initial pump speed = 1084.370 [rpm]
At	0.0000	s	PUMP	P3	Initial pump speed = 1084.290 [rpm]
At	0.0000	s	PUMP	P5	Initial pump speed = 1084.728 [rpm]
At	0.0000	s	PUMP	P6	Initial pump speed = 1084.808 [rpm]
At	0.0000	s	PUMP	P7	Initial pump speed = 1084.728 [rpm]
At	0.0000	s	AIRVva	A1	Air inlet is closed
At	0.0000	s	AIRVva	A2	Air inlet is closed
At	0.0000	s	CHECKV	C1	Starts in open phase
At	0.0000	s	CHECKV	C2	Starts in open phase
At	0.0000	s	CHECKV	C3	Starts in open phase
At	0.0000	s	CHECKV	C4	Starts in closed phase
At	0.0000	s	CHECKV	C10	Starts in closed phase
At	0.0000	s	CHECKV	C9	Starts in closed phase
At	0.0000	s	CHECKV	C5	Starts in open phase
At	0.0000	s	CHECKV	C6	Starts in open phase
At	0.0000	s	CHECKV	C7	Starts in open phase
At	0.0000	s	CHECKV	C8	Starts in closed phase
At	0.30000E-01	s	PUMP	P1	tripping
At	0.30000E-01	s	PUMP	P2	tripping
At	0.30000E-01	s	PUMP	P3	tripping
At	0.30000E-01	s	PUMP	P4	tripping
At	0.30000E-01	s	PUMP	P5	tripping
At	0.30000E-01	s	PUMP	P6	tripping
At	0.30000E-01	s	PUMP	P7	tripping
At	0.30000E-01	s	PUMP	P8	tripping
At	0.90000E-01	s	CHECKV	C10	Opens
At	0.90000E-01	s	CHECKV	C9	Opens
At	2.2500	s	CHECKV	C4	Opens

3.1.5 OUTPUT - K.MARAS 1.KD+2.KD-KAZANLI - Min Hm- 03 JUL 17.wor

At	2.4000	s	CHECKV	C8	Opens
At	4.5000	s	CHECKV	C4	Closes
At	4.8900	s	CHECKV	C8	Closes
At	5.3700	s	CHECKV	C1	Closes
At	5.3700	s	CHECKV	C3	Closes
At	5.4000	s	CHECKV	C2	Closes
At	6.1200	s	CHECKV	C5	Closes
At	6.1200	s	CHECKV	C7	Closes
At	6.1500	s	CHECKV	C6	Closes
At	13.230	s	CHECKV	C5	Opens
At	13.230	s	CHECKV	C6	Opens
At	13.230	s	CHECKV	C7	Opens
At	13.290	s	CHECKV	C5	Closes
At	13.290	s	CHECKV	C6	Closes
At	13.290	s	CHECKV	C7	Closes
At	13.440	s	CHECKV	C5	Opens
At	13.440	s	CHECKV	C6	Opens
At	13.440	s	CHECKV	C7	Opens
At	13.470	s	CHECKV	C1	Opens
At	13.470	s	CHECKV	C2	Opens
At	13.470	s	CHECKV	C3	Opens
At	14.610	s	CHECKV	C4	Opens
At	14.970	s	CHECKV	C8	Opens
At	15.180	s	CHECKV	C10	Closes
At	15.180	s	CHECKV	C9	Closes
At	20.730	s	CHECKV	C4	Closes
At	21.450	s	CHECKV	C8	Closes
At	22.140	s	CHECKV	C1	Closes
At	22.170	s	CHECKV	C2	Closes
At	22.170	s	CHECKV	C3	Closes
At	22.380	s	CHECKV	C5	Closes
At	22.380	s	CHECKV	C7	Closes
At	22.410	s	CHECKV	C6	Closes
At	78.210	s	CHECKV	C10	Opens
At	78.210	s	CHECKV	C9	Opens