



Petkim Petrochemical Complex/Aliaga, Turkey
Aromatic Plant, Rerun Bottoms Pump Modification, turn-key project



REMS

WHO WE ARE?

- Rapid Engineering and Maintenance Solutions - REMS company aim is to provide engineering and maintenance solutions, as well as construction services, to Oil & Gas, Chemical & Petrochemical, Power Generation and other General Industry sectors, in Turkey and in region.
- REMS company relies on its own experience acquired for years in different projects and experience from partner companies (Flowserve, Ethos Energy and Emisshield), world leaders in manufacturing and servicing rotating equipment for the world's most critical applications, on the other hand.



REMS IS CERTIFIED FLOWSERVE SERVICE PARTNER

Certified Service Centre (CSC) for pumping equipment and mechanical seal repairs, with support and control of Distribution support services team from Flowserve

- ✓ Access to technology and technical documentation of Flowserve;
- ✓ Access to central engineering team support;
- ✓ Continuous education of REMS personnel at Flowserve training centres, and on site;
- ✓ Regular audits of Flowserve on the facility standards and application of working processes (implementation of quality KPIs).



WHAT WE DO?

TERMS OF REFERENCE



- Modify existing pump hydraulics in order to meet new Duty Point, defined by the customer.
- Keep same pump footprint (suction and discharge pipelines modification is not allowed, as well as base plate modification).
- Inspect existing coupling, and if not in a good condition change with a new one.
- Change existing single seal to a double seal.
- Change existing API 22 water cooled seal support system, to appropriate - API 53B/23, air cooled.
- Use existing electric motor and base plate.

HEIMS

SCOPE OF WORKS



- Engineering (hydraulic calculations, design, Flowserve)
- Delivery of two new pumps, with modified hydraulics, as per API 610, 12th edition, ATEX certified (Flowserve)
- Delivery of two API 53B/23 seal support systems (Flowserve)
- Delivery of two dual, metal bellow mechanical seals (Flowserve)
- Delivery of new couplings (John Crane)
- Delivery of spare parts for pump for two years of operations and spare seal and coupling sets
- Dismantling of old pumps and seal systems (REMS)
- Installation of new pumps (REMS)
- Erection of new seal systems (REMS/Flowserve)
- Erection of interconnection piping between mechanical seals and seal support systems (REMS/Flowserve)
- Installation of coupling/laser shaft alignment (REMS)
- Commissioning of the pump and seal support system (REMS/Flowserve)
- Start up (REMS/Flowserve)
- Pump and seal system operations monitoring (REMS)
- Full set of documentation (Flowserve/REMS)



APPLICATION/PUMP&SEALS SUPPORT SYSTEM



Service: RERUN BOTTOMS PUMPS

- Product: Hydrocarbon (Heavy Naphtha)
- Temperature: Nor.200°C./Max 260 °C
- Suction Pressure: Normal: 1.29 Kg/cm²g
- Discharge Pressure: 10,66 Kg/cm²g
- SBOX Pressure: 2.4 Kg/cm²G
- Vap. Pressure (Norm): 2.1 Kg/cm²a
- Spec. Gravity (Norm): 0.642
- Viscosity (Norm): 0.21 cP
- RPM: 2950

Pump: Flowserve

- 2 HPX 13B /HORZ/1 Stages
- OH2. 1stg, API 610 12th edition

Seal & System: Flowserve

- Seal: BXHHSBW/BXHHSW
- Size : 3.125"/3.125"
- Configuration: D:P -FB
- API: 23/53B (Air Cooler X2)
- Barrier fluid: Duraclear 32F

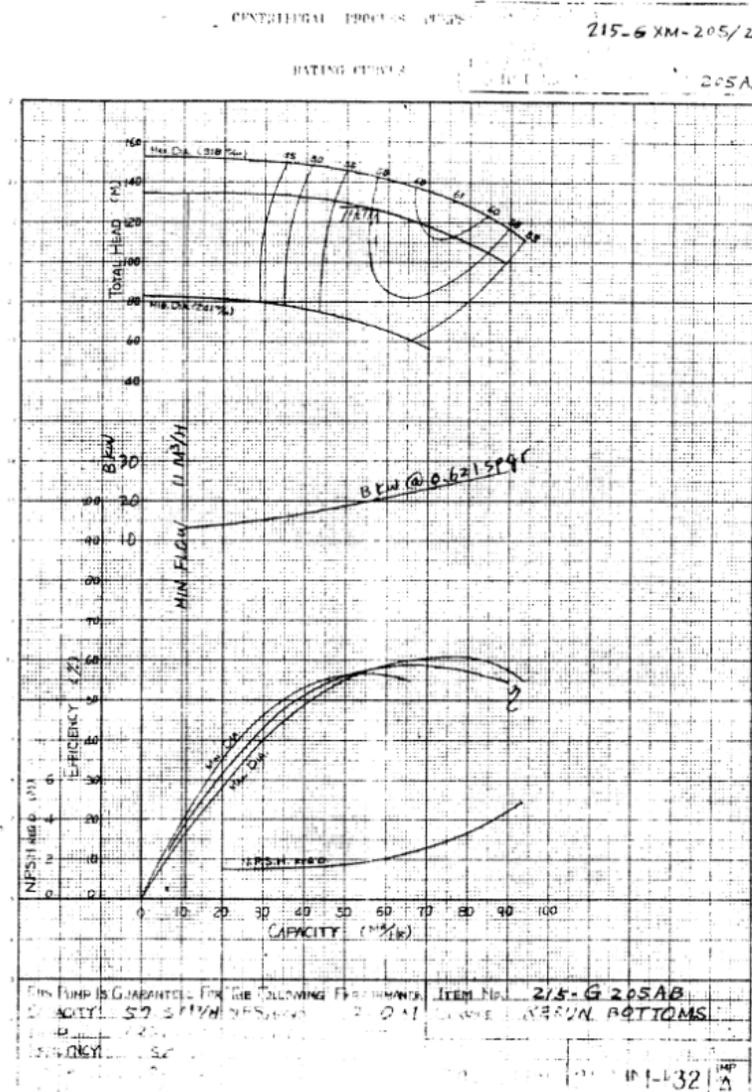
EXISTING PUMP A/B



EXISTING PUMP DATA A/B



CENTRIFUGAL PUMPS		215-GXM 205/1	
1	Client	PETKİM PETROLKİMYA A.Ş. Project	AROMATICS PLANT
2	Unit	NAPHTA HYDROTREATING PLANT FEEDWATER	Service
3	No. of units	1	Manufacturer
4	Spares	1	Model
OPERATING CONDITIONS		CONSTRUCTION	
5	Liquid	HYDROCARBON	Pump type
6	PT (pumping temp) °C	260	HORIZONTAL
7	Sp Gr at PT	0.62	VERTICAL
8	Vis. at PT	2.09	No. of stages
9	Viscosity at PT	—	Impeller type
10	Carbons caused by	—	S-SUCTION CLOSE
11	Capacity: normal	52.2	Valve type
12	rated	57.5	SINGLE
13	Differential head	123.3	Casing support type
14	Discharge press	8.29	CENTRILINE
15	Suction press	1.20	OVERHUNG
16	Diff. press	7.59	Nozzles
17	Water HP	12	Size
18	Max Suction press	3.87	Rating
19	NPSH avail	2.3	Face
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53	REMARKS: API Std. 610-1971 governs unless otherwise stated.		
54	NOTE 1) RATIO OF SHUT OFF HEAD TO DIFF HEAD = 1.09		
55			



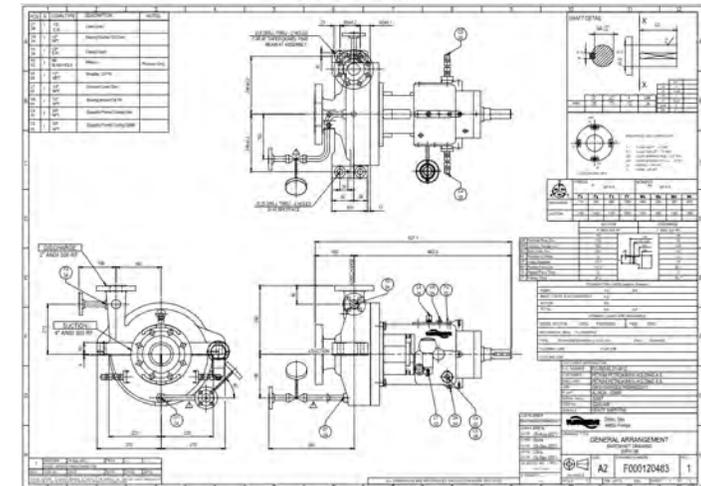
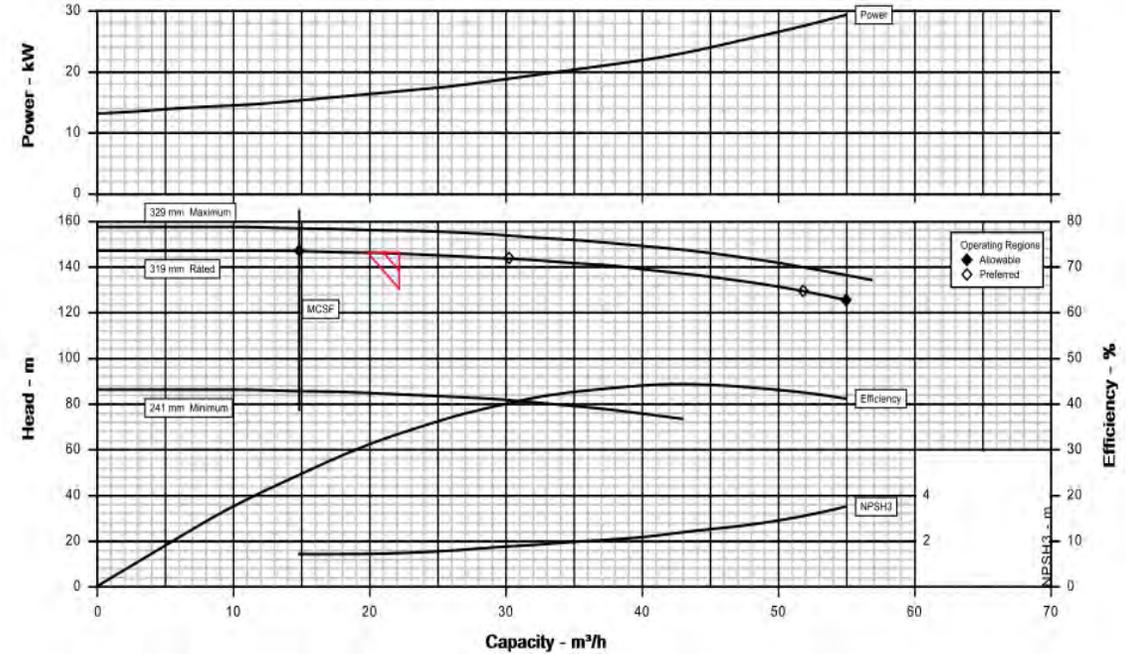
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NEW PUMP DATA



Hydraulic Datasheet

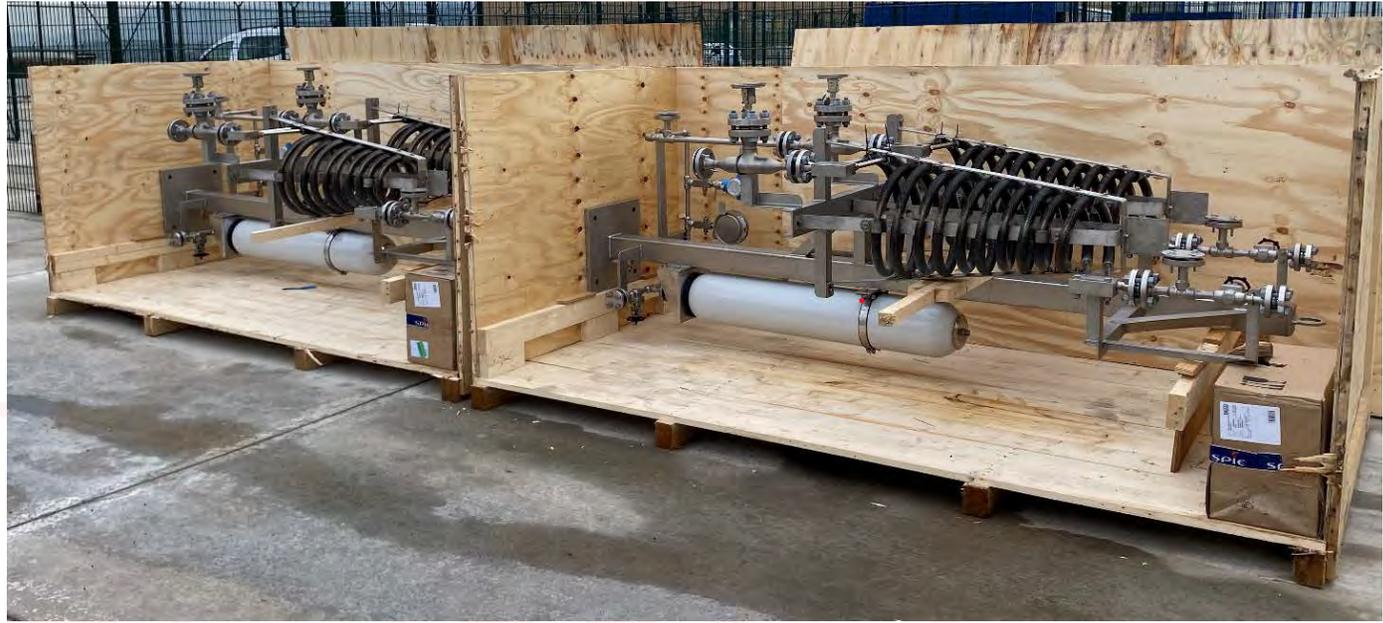
Customer	: PETKIM PETROKIMYA HOLDING A...	Pump / Stages	: 2HPX13B	/ 1
Customer reference	: -	Based on curve no.	: 2HPX13A-1-1-P001	
Item number	: G205 A/B	Flowserve reference	: 3180002554	
Service	: Heavy Naphtha	Date	: March 31, 2021	
Operating Conditions		Materials / Specification		
Capacity (rated/normal)	: 22.2 m ³ /h / -	Material column code	: S-6	
Water capacity (CQ=1.00)	: -	Pump specification	: -	
Total developed head	: 146.00 m	Other Requirements		
Water head (CH=1.00)	: -	Hydraulic selection : API 610 11th Edition		
NPSHa/NPSHa less margin	: 2.9 m / -	Construction : API 610 11th Edition		
Maximum suction pressure	: 3.9 kg/cm ² g	Test tolerance : API 610 11th Edition		
Liquid		Driver Sizing : Max Power(MCSF to EOC) using SF		
Liquid type	: Other	Performance data based on standard impeller		
Liquid description	: Naphtha	Seal configuration : Double Seal		
Temperature	: 200 °C			
Density / Specific gravity	: - / 0.642			
Solid Size - Actual / Limit	: - / 8.001 mm			
Viscosity / Vapor pressure	: 0.22 cSt / 2.10 kg/cm ² a			
Performance				
Hydraulic power	: 5.65 kW	Impeller diameter		
Pump speed	: 2950 rpm	Rated	: 319 mm	
Pump overall efficiency (CE=1.00)	: 33.5 %	Maximum	: 329 mm	
NPSH required (NPSH3)	: 1.5 m	Minimum	: 241 mm	
Rated brake power	: 16.8 kW	Ns / Nss	: 558 / 10502 (Metric units)	
		Minimum continuous flow	: 14.8 m ³ /h	
Maximum brake power	: 29.4 kW	Maximum head at rated diameter	: 147.55 m	
Driver power rating	: 30.0 kW / 40.2 hp	Flow at BEP	: 43.1 m ³ /h	
Casing working pressure	: 13.4 kg/cm ² g	Flow as % of BEP	: 51.3 %	
(based on shut off @ cut dia/rated SG)		Efficiency at normal flow	: -	
Maximum allowable	: 42.2 kg/cm ² g	Impeller diameter ratio (rated/max)	: 97.0 %	
Hydrostatic test pressure	: 63.3 kg/cm ² g	Head rise to shut off	: 1.1 %	
Estimated rated seal chamber pressure	: 2.4 kg/cm ² g	Total head ratio (rated / max) / (max / rated)	: 93.6 % / 106.8 %	



AS FOUND



NEW PUMP, SEAL AND SEAL SYSTEM DELIVERY AT SITE



Checks before installation at site



SEAL SYSTEM INSTALLATIO AT SITE



OLD PUMP REMOVAL



NEW PUMP INSTALLATION



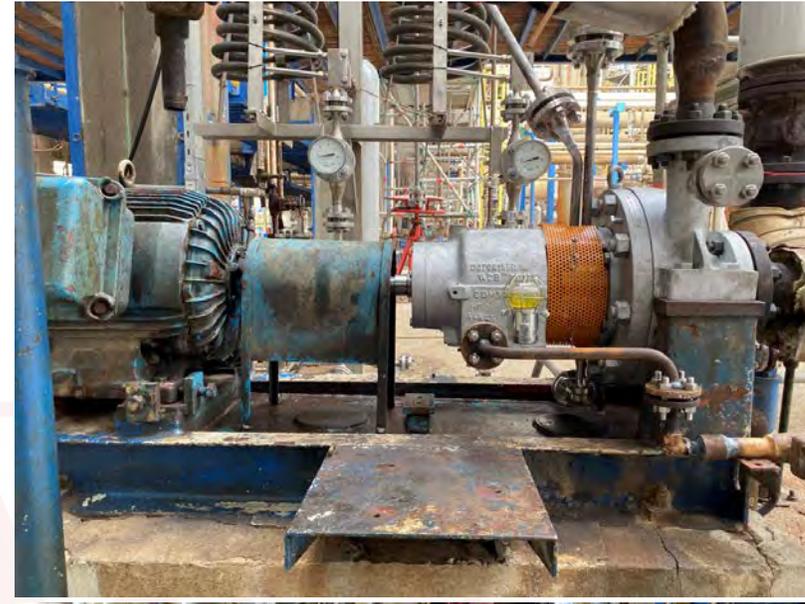
SEAL SYSTEM INTERCONNECTION PIPING



API 53B PLAN N2 AND BARRIER FLUID (Duraclear F32) CHARGING



BEFORE/AFTER



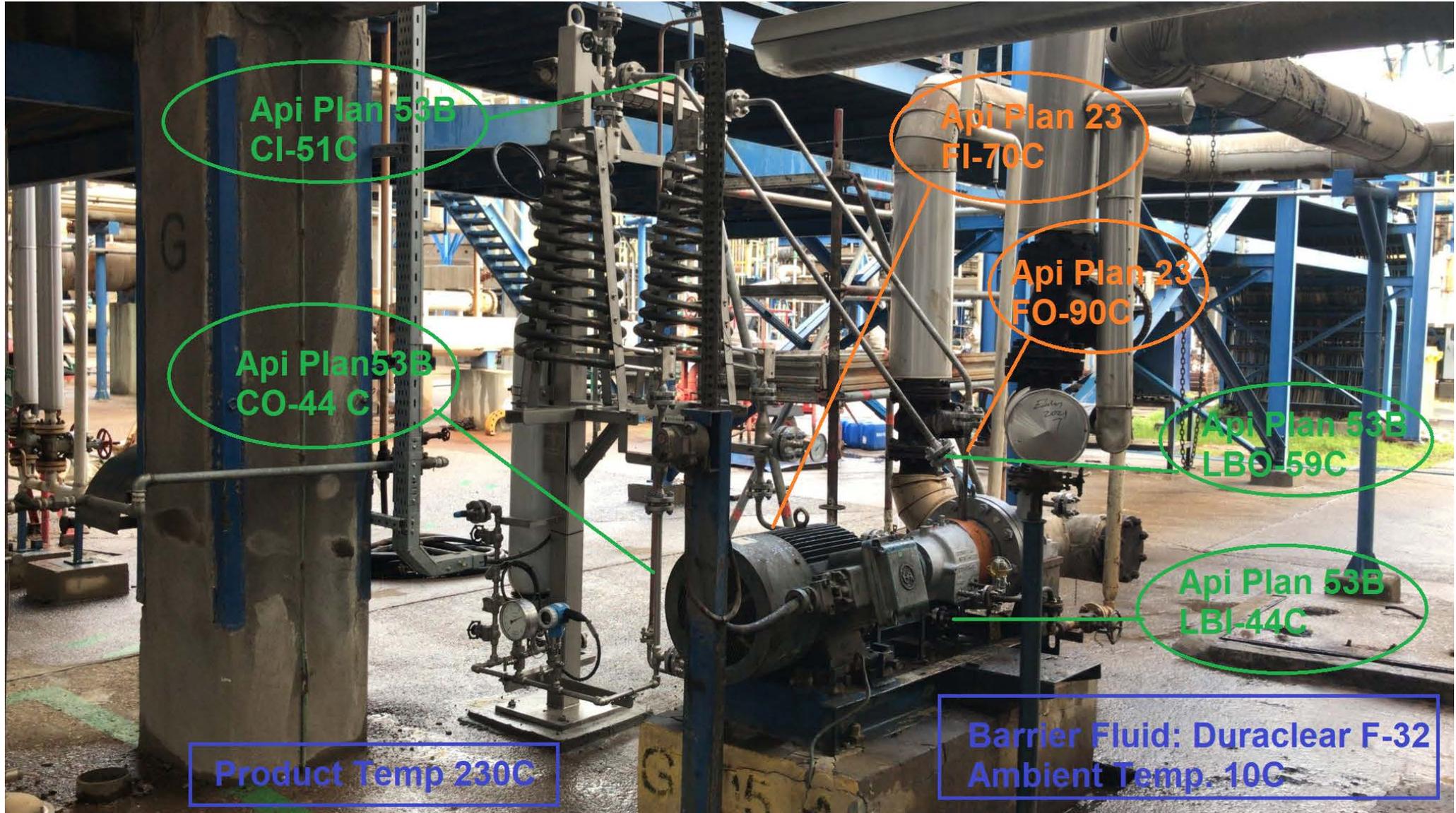
PUMP AND API SYSTEMS COMMISSIONED AND READY FOR START UP



PUMP AND SEAL SYSTEM IN OPERATION



PUMP AND SEAL SYSTEM IN OPERATION



PUMP AND SEAL SYSTEM IN OPERATION



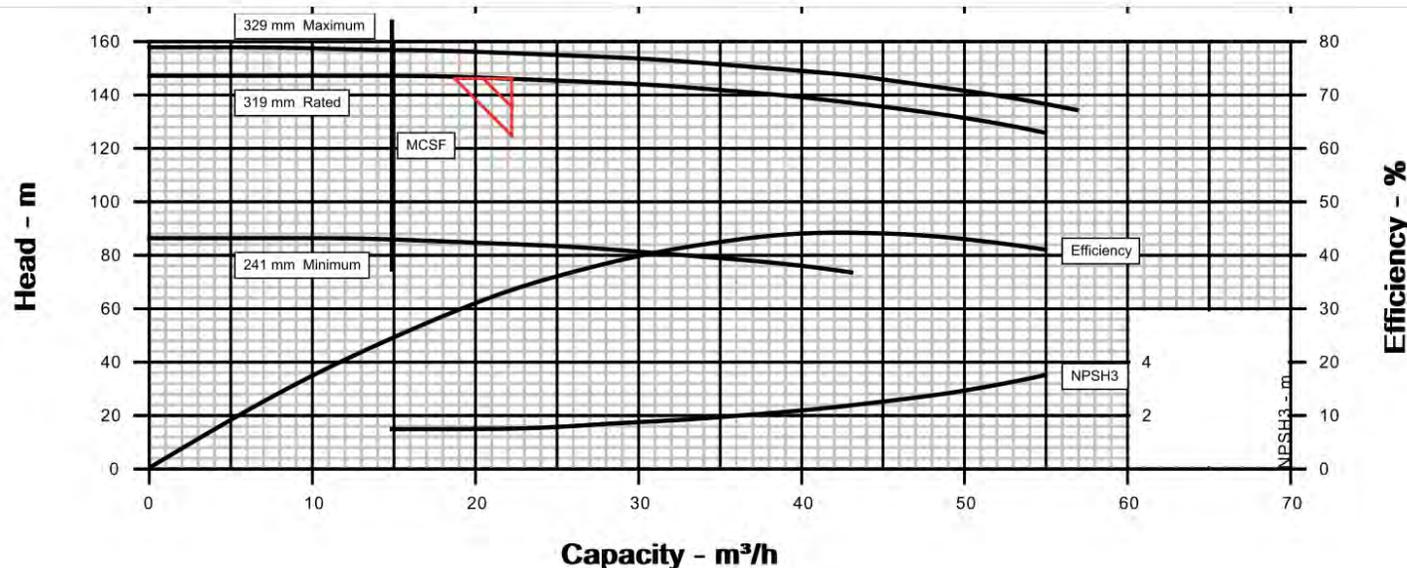
2HPX13B - Hydr. 1 Rev1

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CURVES ARE APPROXIMATE, PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS; CAPACITY, HEAD, AND POWER.



2HPX13B - Hydr. 1 Rev1



TEAM WORK

PUMP AND SEAL SYSTEM INSTALLATION/COMMISSIONING IN FIVE DAYS!!





CONTACT DETAILS:

REMS MÜHENDİSLİK BAKIM ONARIM
VE DANIŞMANLIK SAN.TİC. LTD. ŞTİ.

Çoraklar Mah. 5001 Sk. No:10/1
Aliğa - İzmir TURKEY

Phone number: +90 530 856 71 39

E-mail: info@remSCO.com.tr