

REPORTS ON THE APPLICATION OF XADO TECHNOLOGY · 2003

K-80-60-160 pump, fan and gearboxes: less friction loss and less electricity used

GAO Chernomorneftegaz, UPKhG underground gas storage and DKS MZU "Smena" · contractor: ChPKP "Rigonda" · approved by: A. I. Dantsev, Director of the Production Engineering Support Directorate
Crimea, Ukraine · contract No. 2602/1328 · contract No. 1 of 05.02.2003 · treatment 26.02.2003 — March 2003, final report 05.09.2003

PRODUCT

Mixture of XADO gel and XADO grease
on worn bearings additionally — XADO "Repair" grease; single treatment

TREATED UNITS

Bearing assemblies of pumps, a fan and gearboxes
K-80-60-160 pump · P-1 fan · boiler house pump group · washing machine gearboxes

DOCUMENT TYPE

Reports on the application of XADO technology
customer and contractor signatures, stamps, approval endorsement

EQUIPMENT	DRIVE AND ASSEMBLIES	OPERATING TIME BEFORE MEASUREMENT	WHAT WAS MEASURED
P-1 supply fan of the UPKhG process pump station, inventory No. 23	4AM160S6: 11.0 kW, 975 rpm; 4 bearing assemblies	170 h	Phase currents under load, bearing temperature
K-80-60-160 pump, boiler house of DKS "Smena"	AK11212U1: 7.5 kW, 3000 rpm; 4 assemblies	430 h	Phase currents under load and at no load
Boiler house pump group: 3 continuously running units	Bearings of the motors and the pumps	430 h, re-check after 6 months	Phase currents, temperature, noise
Washing machines of the laundry department, 25 kg	Gearboxes, 6 h of operation per day	1100 h (6 months)	Phase currents

All units ran in normal service: the treatment was performed without disassembling the assemblies and without taking the equipment out of operation.

Key results

↓ **16,7-29,7 %**

current of the K-80-60-160 pump under load, 10.2-12.8
→ 8.5-9.0 A

↓ **10-10,7 %**

current of the P-1 fan under load, 14-15 → 12.5-13.5 A

K-80-60-160 pump with AK11212U1 motor — phase currents

MODE AND MEASUREMENT	PHASE A	PHASE B	PHASE C
Under load, before treatment	12.8 A	11.6 A	10.2 A
Under load, after 430 h of operation	9.0 A	9.0 A	8.5 A
No load, before treatment	12.8 A	11.4 A	9.8 A
No load, after 430 h of operation	7.8 A	7.7 A	7.0 A
Under load, re-check after 6 months	10.3 A	10.2 A	10.0 A

Single-stage treatment, March 2003. The current stayed below the initial level even after six months of unit operation.

P-1 supply fan with 4AM160S6 motor — phase currents

MODE AND MEASUREMENT	PHASE A	PHASE B	PHASE C
Under load, before treatment	15 A	15 A	14 A
Under load, after 170 h of operation	13.5 A	13.5 A	12.5 A
Motor with worn bearings, before treatment	15.2 A	15.5 A	14.5 A
Same motor after treatment with "Repair" grease, 220 h	15.2 A	15.0 A	13.8 A

The first current drop was recorded after 100 h of operation. With the fan running around the clock, the report estimates the saving at 582 kWh per month.

Boiler house pump group and laundry department gearboxes, DKS "Smena"

UNIT	WHAT WAS MEASURED	RESULT
Boiler house pump group, 3 continuously running units	Phase currents under load, 430 h	Drop of 2.7 A on average across the three phases
Same group, re-check after 6 months	Phase currents under load	Drop of 1.4 A against the initial values still holds
Washing machine gearboxes, 25 kg	Phase currents, 1100 h of operation	Drop of 0.9 A
Pump group, 3 units, six months of operation	Electricity saving	10 400 kWh as calculated by the contractor

The saving was calculated in the report from the current reduction that actually held with the units running around the clock.

Report conclusions

The reports, approved by GAO Chernomorneftegaz and signed by both parties, state: "The application of XADO technology reduces mechanical losses in the electric motor and in the unit as a whole, which leads to lower electricity consumption." As the experiment showed, the main friction losses occur in the bearing assemblies on the impeller shaft of the P-1 supply fan, and "reducing them is a real contribution to the Comprehensive Energy Saving Programme in Crimea." A separate episode is the electric motor whose inspection revealed considerable bearing wear: the unit was returned to service on the spot. "The restorative repair of the electric motor bearings, carried out using XADO technology, demonstrates the possibilities of repair without disassembly. A repair that requires no purchase of expensive spare parts, no labour costs and, finally, no removal of the equipment from service."

XADO

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The results refer to the K-80-60-160 pump and the P-1 supply fan with AK11212U1 and 4AM160S6 motors, to the boiler house pump group and to the washing machine gearboxes under the operating conditions of GAO Chernomorneftegaz and DKS MZU "Smena", 2003; on other equipment and in other duty cycles the figures may differ. The treatment and the saving calculations were performed by the contractor, ChPKP "Rigonda". The original reports with signatures and stamps are published in full and available for download.