

Brief Report Regarding the 75kW Pumps Installed and Tested in ZhouKou, China

The motors are running simple rotary water pumps feeding a local filtration and purification plant from a reservoir. Apart from valve controls on both the input feeds from the reservoir and on the outputs to the purification plant there are no other control systems within the circuit structure.



The switchgear that was replaced by the installation of the EnviroStart was a basic three stage auto transformer being switched from Star configuration to Delta for running. The installed system took the auto transformer and the Star Delta switching out of circuit. The soft stop feature was enabled on both pump controls.

Apart from the soft stop feature being enabled on DIP Switch 2.1 all other switches were in default condition per current Installation and Commissioning Guide. (v10).

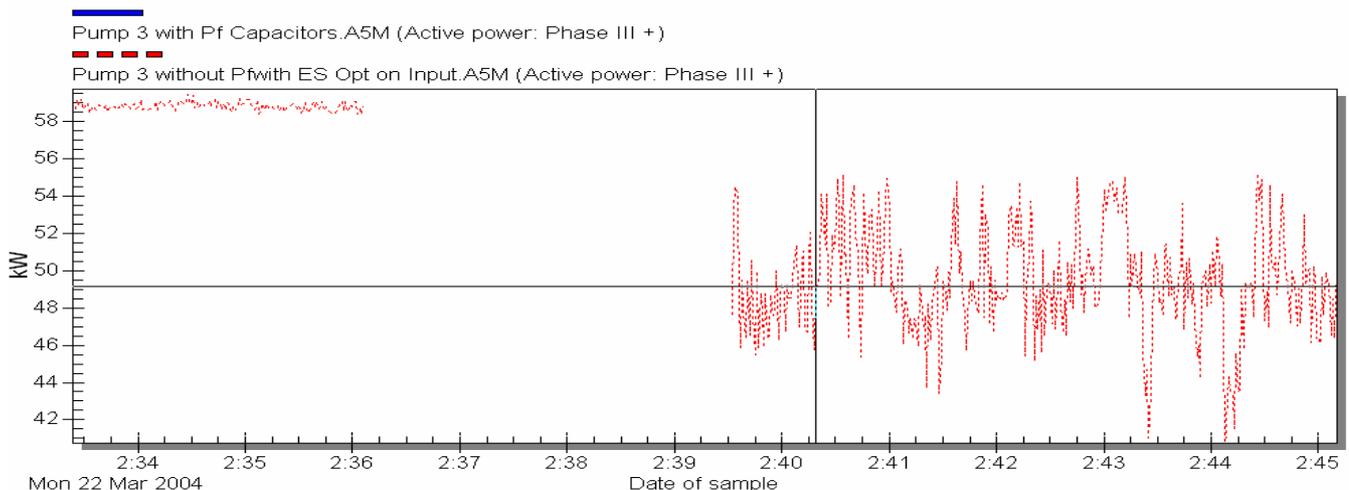
Both motors were ramped up and stopped several times to ensure the efficiency and effectiveness of the control gear and installed wiring. Pump three had been running with EnviroStart in circuit for some eighteen hours prior to the results shown below being taken.

Pump 3 is used as the main feed with Pump 1 acting as primary back up. Pump 2 is rarely used. For this reason the majority of the testing was conducted on Pump 3 using a Circutor a5M and a NanoVip.

Circutor A5M Three Phase Data Log Analyser (S/N 0268005/4) (Calibration Certificate to 31.5.2004)
NanoVip Plus Data Log Power Meter (S/N 17960) (Calibration Certificate to 10/2004)

Pump Three

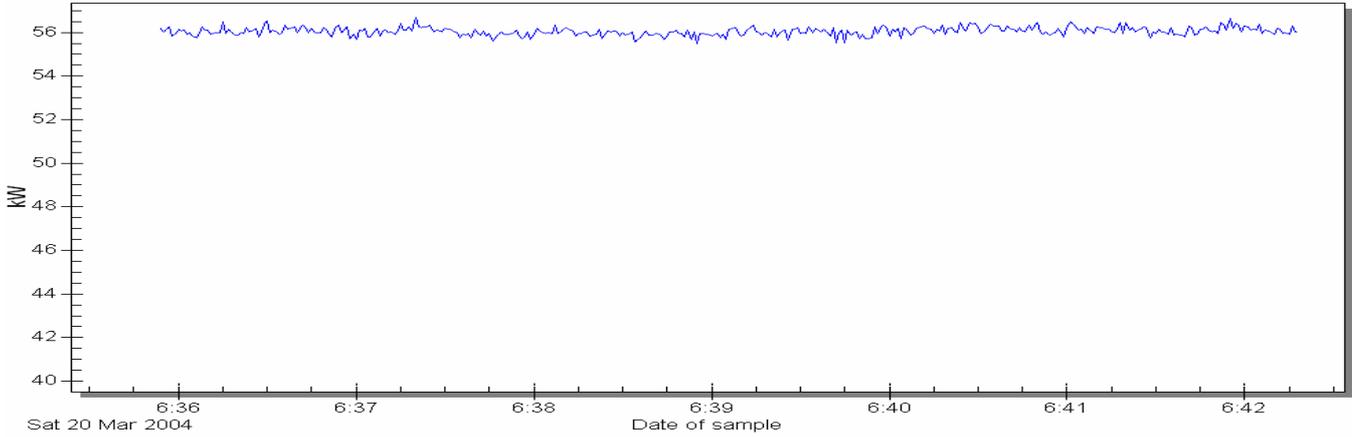
MULTIGRAPHIC Hours (2/2)



Selected Variable: Pump 3 without Pwith ES Opt on Input.A5M (Active power: Phase III +)
Act : 22/03/2004 02:40:19 From : 22/03/2004 02:28:32 To : 22/03/2004 02:48:46
Act : 49.14 (kW) Maximum : 59.43 (kW) Minimum : 40.32 (kW)

The detail above shows the effects of the EnviroStart being switched in at around the 2:39 point and the effective reduction in consumed kW from a mean around 58.5kW to a mean of around 48kW. This should be weighted against the Pf corrected data shown below.

Pump 3 with Pf Capacitors.A5M (Active power: Phase III +)



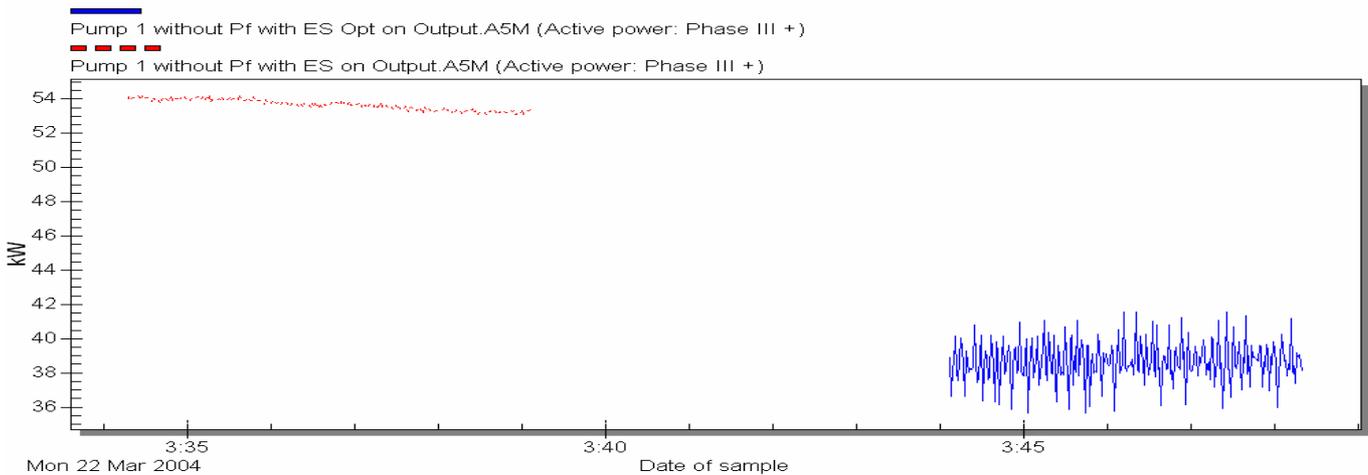
Act : 20/03/2004 06:31:23 From : 20/03/2004 06:31:23 To : 20/03/2004 06:42:18
 Act : 40.39 (kW) Maximum : 56.66 (kW) Minimum : 38.24 (kW)

It is clear that the savings between the system with Pf Correction Capacitors in circuit and the savings using the EnviroStart show that there is a specific saving of 15.19% during the period that the measurements were taken in favour of the use of EnviroStart. (The use of PF Correction Capacitors alone was yielding a saving of 3.25% only). On a system where Capacitors had not been installed the overall savings would be 18.44%.

We recognise that the loading was potentially optimal at the time that the measurements were taken and therefore would suggest that the savings to be expected longer term would mean out to be between 11.5 and 15.3 with a 6σ statistical variability of ±2.5%.

Pump One

MULTIGRAPHIC



Selected Variable: Pump 1 without Pf with ES Opt on Output.A5M (Active power: Phase III +)
 Act : 22/03/2004 03:34:18 From : 22/03/2004 03:44:07 To : 22/03/2004 03:48:19
 Act : ? (kW) Maximum : 41.56 (kW) Minimum : 35.63 (kW)

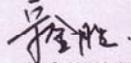
At the time of the testing on Pump 1 the load levels were very low as Pump 3 was also in circuit. The results shown here are therefore not truly representative of the savings that would be normally expected which would be more in keeping with those given for Pump 3. During the time of the test the savings achieved by EnviroStart in default mode were >25%.

It should be recognised that the installation of EnviroStart has not only provided effective energy savings for the Customer but has also provided an effective maintenance free soft start system with managed soft stop and continuous circuit and motor protection.

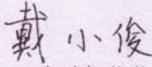
This is a shortened version of the overall report but provides highlights of the testing and evaluations conducted at the time of the installation at ZhouKou. On the following page we provide a copy of the certified and authorised report as generated and agreed by the ZhouKou Water Authority

EMS 电动机优化器节电效果测试报告

测试方： 河南省周口市自来水公司

监测人员： 

施工方： 北京润德堡科贸有限公司

测试人员：  戴小俊

现对该单位安装了 EMS 电动机优化器的电动机设备进行测试，数据如下：

编号	电动机应用	优化器型号	电动机 额定功率 (KW)	测试 时间 (小时)	优化器 安装前 有功功率 (KW)	优化器 安装后 有功功率 (KW)	节电率
1	1号 Y280S-4	400-TPMEC-75	75	6	52.4	39.7	24.2%
2	3号 Y280S-4	400-TPMEC-75	75	24	62.3	54.1	13.2%
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12							

测试结论：

据以上数据可知，安装 EMS 电动机优化器后可获得明显的节电效果，其综合的节电率为_____。
 安装 EMS 后，可降低起动电流和机械冲击力，减少设备的故障几率，提高设备运行效率和可靠性，
 减少维修费用。随着运行时间的增加，综合效益将越来越明显。

检测方盖章：



施工方盖章：



2004年3月22日

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