

Plant Maintenance Service & Consultancy

Safety as well as plant reliability and product quality can be negatively affected by inadequate maintenance service. Quality of such service is mainly driven by effective work processes, adequate tools and training of maintenance people. Raschka Engineering has built up specific expertise via intensive training and experience gained over the last ten years in cGMP and none GMP production plants, a vast amount of our local maintenance staff has been trained overseas and we do offer maintenance service to third party customers which could include full maintenance service, renting of specialists with tools, training or just provide you with some consultancy.

Listed below are some examples of good maintenance practice we would happily share in more detail with our valuable customers:

1. Alignment of motor shaft using laser technology (rent team and machinery to check your installation)
2. Preventive maintenance (checks on status of your machinery, plan your maintenance activities)
3. Lubrication plan, checks and action list
4. Instrument calibration
5. Checks about condition of mechanical seals



Alignment of motor shaft using laser technology

In the chemical, pharmaceutical, power generation, petrochemical industry etc, motor alignment is of critical importance in order to maintain plant reliability.

If the motor is not correctly aligned, the stress placed on the motor shaft will cause premature wear and failure of the motor bearings, leading to plant breakdowns, lost production, and potential safety hazard.

Raschka Engineering employs a number of trained technicians who are experts when it comes to motor alignment.

Lonza engineering's service technicians are routinely contracted to perform motor alignment services at customer's production plant.

Benefit of a precise alignment

- Reduced vibration levels
- Reduced maintenance cost
- Reduced energy consumption

Pump and Motor alignment



Proposed actions

- Check shaft alignment of all production equipment which are considered to be critical preferably on an annual basis
- Monitor vibration as an indication of misalignment. Misalignment might be caused by foundation settling, insufficient bolt tightening or coupling faults
- Recheck newly installed equipment for alignment changes due to foundation settling
- After maintenance or system cleaning, recheck the pump or agitator for alignment changes due to piping stress

Pump vibration measurement



Preventive maintenance

Vibration measurement and historical tracking of data enables planned actions prior to breakdown of machinery and unwanted disruption of production.

- For critical machines, setting fixed horizontal and vertical measuring points
- Measuring and recording vibration values in regular intervals
- In case vibration value goes above upper standard value, the reason will be analyzed and shutdown plan for this machine will be discussed with operations team

Pump temperature measurement



Vibration and temperature recording



关键设备振动、温度记录

广州南沙龙砂有限公司

2017年12月

日期	振动测量点 (mm/s)					温度测量点 (°C)					检查人	备注
	点1	点2	点3	点4	点5	点1	点2	点3	点4	点5		
1	0.7	0.8	0.6	0.7	0.7	77	81	81	81	81	李林	
2	0.7	0.8	0.6	0.7	0.7	76	81	81	81	81	李林	
3	0.7	0.8	0.7	0.7	0.7	76	81	81	81	81	李林	
4	0.5	0.3	0.6	0.4	0.4	80	81	81	81	81	李林	
5												
6												
7	0.7	0.5	0.8	0.4	0.4	72	81	81	81	81	李林	
8	0.6	0.5	0.8	0.4	0.5	71	81	81	81	81	李林	
9	0.6	0.5	0.9	0.4	0.5	78	81	81	81	81	李林	
10	0.6	0.5	0.9	0.4	0.5	80	81	81	81	81	李林	
11	0.6	0.5	0.9	0.3	0.5	78	81	81	81	81	李林	
12												
13												
14	0.6	0.6	0.9	0.4	0.5	78	81	81	81	81	李林	
15	0.6	0.6	0.8	0.6	0.6	80	81	81	81	81	李林	

Revision Action Plan

Nansha Ltd.

Equi. No.: 0067 Pos. No.: A705

Designation: PUMP

Description: 屏蔽泵

Rev. Action Plan: 1-001

P&I Drawg No.: LV1-68089-002

Supplier: 天津常国屏蔽泵有限公司

Date: 2009-6-28

Name: Fichname	Control execute Date	Signature	Remarks

Action Plan

Equi. No.: 0067 Pos. No.: A705

需要更详细的资料，请参阅操作手册。

- 安全**

是否需要安全许可？

为了避免带电操作以及接触旋转部件造成的危险，必须断开所有通向马达及与泵有关设备的电源，并在开关处悬挂警示牌。泵在操作时不允许进行维修。
- 控制**

屏蔽泵严禁空载运行！！！！

否则会导致滚动轴承的损坏。泵在空载运行或抽空后，应立即检查滚动轴承。正常操作情况下出现异常振动、噪音及负荷增加，表示有故障。
- 检修(检修周期为12个月)**

？检查各部位联接螺栓紧固情况并清除油垢；

？检查与冷却水系统，保持畅通；

？检查轴承监测器是否完好；

？检查、清理系统中的过滤器；

？检查循环系统中针形阀的密封状态和调节是否灵活。

？清洗叶轮和泵壳内腔，检查叶轮、辅助叶轮的磨损和腐蚀情况，测量口环间隙；

？检查轴承、轴套和轴套的磨损情况；

？检查定子、转子、壳体和轴的磨损和腐蚀情况，必要时对转子和定子做无损检测；

？全面检查电气接线和泵的绝缘情况，检查定子与转子的电气性能；

？测量转子的径向跳动量，必要时对转子部件做动平衡试验；

？清洗、检查冷却器及泵套，清除锈迹和更换密封圈；

？检查其它各零件的磨损和腐蚀情况。

注：检修与质量标准见安装使用维护说明书

Lubrication plan, checks and action list

- Machines require a lubrication plan which needs to be based on manufacturer's maintenance manual.
- Lubrication points are clearly marked on machines with tag and indication of the lubricant to be used.
- Required lubrication interval is defined in lubrication plan and activities are logged and signed off after completion.
- Identified actions as part of planned maintenance service are logged in "Revision Action Plan".

Regular lubrication



Lubric./Control Action Plan

Nansha Ltd.

Equi. No.: 0067 Pos. No.: A705

Designation: Pump

Description: 屏蔽泵

Lube. Action Plan: 1-001

P&I No.: LV1-68089-002

Supplier: 天津常国屏蔽泵有限公司

Name: Fichname	Control execute Date	Signature	Remarks

Lubric./Control Action Plan

Nansha Ltd.

Equi. No.: 0067 Pos. No.: A705

需要更详细的资料，请参阅操作手册。

- 安全**

是否需要安全许可？

为了避免带电操作以及接触旋转部件造成的危险，必须断开所有通向马达及与泵有关设备的电源，并在开关处悬挂警示牌。泵在操作时不允许进行维修。
- 控制**

屏蔽泵严禁空载运行！！！！

否则会导致滚动轴承的损坏。泵在空载运行或抽空后，应立即检查滚动轴承。正常操作情况下出现异常振动、噪音及负荷增加，表示有故障。
- 维修保养(执行巡检制度)**
 - 泵各连接部位是否松动。
 - 压力表指示是否稳定正常。
 - 电液值是否稳定或偏高。
 - 电液表中是否有异常和异常波动，发现有异常声音和波动应及时处理。
 - 检查轴承检测器指示是否在安全区域内操作。
 - 检查泵的各部分温度，应特别注意循环液进出口的温度变化。
 - 冷却水系统的流量和温度是否正常。

Instrument calibration

Reliable and accurate operating instruments are a basic requirement in the chemical and pharmaceutical industry. Product quality and safety is all depending on properly functioning instruments. Clear and traceable procedures combined with well trained instrument technicians are essential for a successful pass of customer audits especially when producing under cGMP standards.



Standard platinum resistance thermometer calibrator

It includes HTS-300 standard thermostatic oil bath, RTS-30 Refrigeration thermostatic bath, KEITHLEY 2000 digital multi-meter, WPB-2 Standard Platinum Resistance Thermometer etc. used to calibrate various Platinum Resistance Thermometers in range -30ff300 degree C.



Portable pressure calibrator

Battery-powered instrument with its own work pressure source. It provides fine tuned pressure control, power output and measuring function. It can also provide a 4-20mA output for loop test and data storage and measures/calibrate various pressure transmitters on-line and off-line in the range of 0-2.0 MPa.



Manometer calibrator

Desktop manometer calibrator equipped with booster unit and a variety of nozzles for manometer. It can calibrate manometers in the range of 0-25.0 MPa.

Measurement Certificate



Checks about condition of mechanical seals

Mechanical seals are usually a very delicate but also expensive part of equipment and very costly if not properly maintained. A proper design and selection of the best suited sealing type (not necessarily the cheapest one) can make a big cost difference in the long run. Especially mechanical seals require a lubricant which can potentially interfere with the process or in the worst case contaminate the product; such systems therefore require special attention when it comes to maintenance.

In this context, Raschka Engineering's service could include:

- Maintenance service
- Troubleshooting
- Maintenance system - gap analysis
- Consultancy service for maintenance concept
- Training
- Renting shaft alignment team with tools
- On call service team
- Continuous improvement program

Pls. contact us for a quotation. An extensive service list is available on our website:

<http://www.raschka-engineering.com>

Gas monitoring system for gas lubricated mechanical seal, designed and installed by Raschka Engineering



Pump with pressurised oil tank and integrated heat exchanger for double mechanical seal



Contacts

Raschka Engineering Ltd
Dachsweg 12 CH-4410 Liestal, Switzerland
Tel: +41 61 534 9913
or +41 79 750 9845
Email: info@raschka-eng.com
Website: <http://www.raschka-engineering.com>

Raschka Guangzhou Engineering & Consulting Co. Ltd
Room 401, South Tower, Peace Business Centre, No. 898 of
Guangzhou Avenue South, 510305, Guangzhou, China
Tel: +86 20 8966 4288
Fax: +86 20 8966 4278
Email: info@raschka-eng.com
Website: <http://www.raschka-engineering.com>