Review Of Research
Vol.1,Issue.10 , July; 12pp.1-4
ISSN:-2249-894X

Available online at www.reviewofresearch.net

ORIGINAL ARTICLE

Analysis of Different Maintenance Activity Period for Air Screw Compressor

Amit Bahekar[1], Om Prakash Shukla[2] and Jaya Vijayvargiya[3]

[1]Assistant Professor ,Malwa Institute Of technology, Indore, M.P
Email:- amit62100@rediffmail.com
[2]Assistant Professor ,Malwa Institute Of technology, Indore, M.P
Email:- omprakash_shukla97@rediffmail.com
[3]B.E. Student, RKDF College Of Engineering, Indore M.P.
Email :- jvijay_ind@yahoo.com

Abstract:
Prevention of potential failure is required for reliable and safe operations of machineries and the prevention of catastrophic failure can be done by appropriate maintenance. Preventive maintenance (PM) is the practice of maintaining equipment on a regular schedule based on elapsed time or meter readings. The intent of PM is to "prevent" maintenance problems or failures before they take place by following routine and comprehensive maintenance procedures. The goal is to achieve fewer, shorter, and more predictable outages. A Schedule or Preventive maintenance is the best suitable technique to avoid unwanted futuristic failures through condition monitoring or signature analysis for rotating machineries. The main reason for setting up a preventive maintenance program is to prevent unscheduled outages from failure of equipment. Depending on the circumstances, an unscheduled outage will be, at least, very inconvenient and can be extremely expensive.

A successful program of preventive and routine maintenance will reduce equipment failures, extend the life of the equipment, and reduce the overall operating costs. But question is that the schedule program given by manufacturer is not exact so in this paper author has calculated exact schedule hours and compare it with ideal one. This publication is intended to provide general information on the exact frequency for maintenance of some of the most common components found in screw compressor. Manufacturer's literature and actual operating experience should be used for setting up a maintenance program.

Keyword:- Maintenance Schedule program, Preventive Maintenance Of Screw Compressor

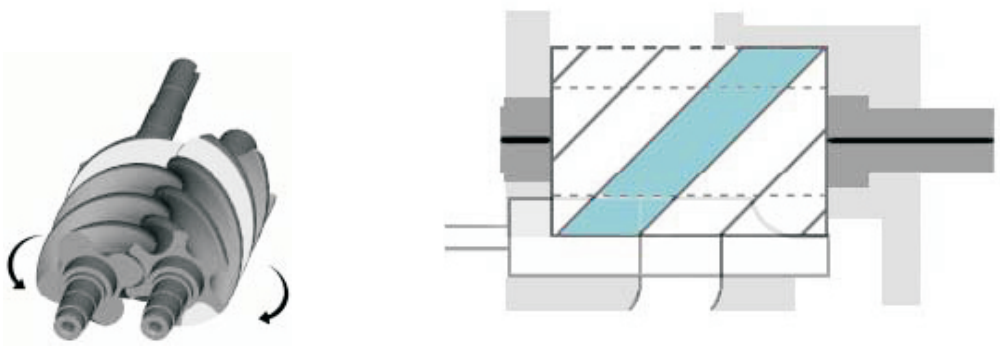
INTRODUCTION

Oil flooded rotary screw compressors have been widely used on various air and refrigeration
Applications for over forty years. These machines did not make a significant presence in the natural gas industry until the early 1990's. Until this time, reciprocating compressors had been used almost exclusively for natural gas compression. As gas fields have matured and field pressures have dropped, screw compressors have become a very attractive alternative and supplement to reciprocating machines. This paper will discuss some of the applications and features of screw compressors, basic operating principles and the advantages of the rotary screw over conventional reciprocating compressors for the natural gas compression industry. We will look at the machine itself, as well as the overall compression system and the

Please cite this Article as : Amit Bahekar, Om Prakash Shukla AND Jaya Vijayvargiya ,ANALYSIS OF DIFFERENT MAINTENANCE ACTIVITY PERIOD FOR AIR SCREW COMPRESSORANALYSIS OF DIFFERENT MAINTENANCE ACTIVITY PERIOD FOR AIR SCREW COMPRESSOR : Review Of Research (July; 2012)

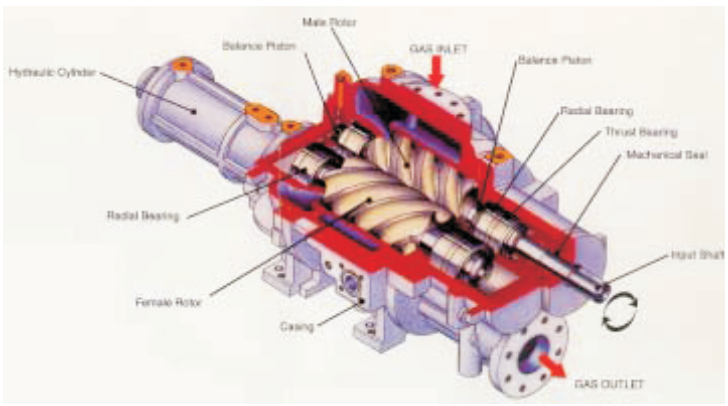
components required in a screw compressor package. The screw compressors we will focus on are the oil flooded, heavy duty process gas machines rather than the air derivative types. We will provide numerous illustrations to help better understand the screw machine. Figure 1 shows the basic geometry of the rotary screw compressor. View (A) is a simple representation of the actual rotors. We have labeled the male rotor lobe and the female rotor flute. As the rotors turn in an outward direction, the male flute will enmesh from the female flute forming an area for the gas to enter. The gas becomes trapped in the machine and compression occurs when the lobes of the rotors begin to mesh together again. The shaded area represents the pocket of gas that occurs within a specific flute. View (B) is a representation of the side view of the machine. The same

flute is shaded for comparison. Here we see the suction port in the upper left corner and the discharge port in the lower right corner. The rotors will turn in an outward direction forcing the male and female flutes to enmesh, allowing process gas to enter the top of the machine. The gas will travel around the outside of the rotors until it reaches the bottom where the compression actually occurs. Gas will be discharged in the lower right corner of the picture.



(A) Rotors **(B) Side View**

Figure 1



METHODOLOGY

Each compressor manufacturer has a specific maintenance interval that they require to be followed for warranty purposes but to run the compressor more efficiently & trouble free some experimental results are taken. In this experiment practically hours are calculated for schedule maintenance task The following Preventative Maintenance program can be used as guidelines for most Rotary Screw Compressors.
Some Safety Procedure Applied As Follows

Inlet Air Filters – this filter is usually just a paper type filter that is used to protect the compressor air

end/element from environmental contaminates. Under normal conditions this filter should be changed out every 1880 hours of compressor operation. If your compressor is in a dirty, dusty environment you will need to change out the filter more frequently. Never change out this filter with the compressor running.

Oil Filter –This filter needs to be changed out after the first 470 hours of a new compressors operation. Once this has been achieved the filter should be changed out every 1700 hours of operation. If the oil filters start to become clogged up with a large amount of contaminants the compressors air end/element discharge temperature will start to rise. This is one of the first signs that the oil filter needs to be changed

Air/Oil Separator – This filter is used to separate the oil from the compressed air before this air is discharged out of the compressor. This filter can normally be changed when you change the oil; this is normally every 5500 hours of compressor operation. Sometimes this reading may change according to quality of oil. As this filter separator the oil from the compressed air it actually beings to get clogged, this cause a pressure drop across the filter from the discharge air pressure and the sump tank pressure. Normally this pressure drop is 0-3psi. However, as the separator filter is used this drop will increase and if left unattended the pressure drop will actually cause a hole to form in the filter. Once this is done the filter is no good and your compressed air system will be flooded with oil. So another way to make sure this does not happen is to monitor your pressure drop across the separator filter and once this pressure exceeds 8psid go ahead and change out the filter

Drive Belts – If your compressor has a drive belt that helps turn the air end this belt is recommended to be changed out at least once a year or 8400 hours of operation depending on which one comes first.

Automatic Belt Tensioning Device – If your compressor has an auto adjusting belt tension then this needs to also be changed out when you change out your drive belts

S N	Maintenance Activity	Maintenance Frequency Given By Manufacturer(Hrs)	Actual Frequency Calculate by Experiment (Hrs)	Difference in Hours
1	Check oil level	24	48	24
2	Check coolant level	24	48	24
3	Check safety valve	24	24	--
4	Drain condensed water	24	24	--
5	Change lubricating oil	500	620	120
6	Replace oil filter	500	710	210
7	Grease electric motor bearings	500	620	120
8	Blow out radiator	500	660	160
9	Change air filter	2000	2170	170
10	Check and tighten all electrical	2000	2190	190
11	Check belt tension	2000	2000	--
12	Inspect all piping	2000	2200	200
13	Thoroughly clean sight glasses	2000	2150	150
14	Grease electric motor bearings	4000	3800	-200

RESULT & DISCUSSION:-

This above table is intended to establish recommended practice as well as to give
General advice and guidance in the maintenance of screw compressor equipment owned
and operated by industry. Maintenance recommendations are based on industry standards and experience in Reclamation facilities.

CONCLUSION :-

In this paper, authors have been presented a brief review of differences in ideal hours & calculated hours. some recent techniques & condition monitoring devices are used For calculating the same. After taking experimental reading we conclude that whatever the data given by manufacturer is somehow trial &

generalize form. Because of that lots of energy wasted We have seen that experimentally the readings comes that can save more energy as well component failure. On other hand Screw compressors are not designed to replace reciprocating machines. They are designed to provide a very flexible, highly reliable alternative for low pressure applications.

REFERENCES:-

1. Billinton, R., Pan, J., (2000) Application of Monte Carlo simulation to optimal maintenance scheduling in a parallel-redundant system, IEE Proceedings- Generation, Transmission and Distribution, v 147, n 5, September 2000,
2. Bottazzi, A., Dubi, A., Gandini, A., Goldfeld, A., Righini, R., Simonot, H., (1992) Improving the preventive maintenance of a bus yard by a Monte Carlo simulation method, Safety and Reliability '92, 10-12 June 1992 , Copenhagen, Denmark, p 883-95.
3. Alfares, H.K., (2002) Developing optimum preventive maintenance schedules using simulation: A case study, International Journal of Industrial Engineering: Theory, Applications and Practice, v 9, n 3, September 2002, p 311-318.
4. Alardhi, M., Hannam, R.G., Labib, A.W., (2007) Preventive maintenance scheduling for multi-cogeneration plants with production constraints, Journal of Quality in Maintenance Engineering, v 13, n 3, 2007, p 276-92.
5. Cassady CR, Kutanoglu E (2003) Minimizing job tardiness using integrated preventive maintenance planning and production scheduling.IIE Trans
6. Wang L, Zheng DZ (2001) An effective hybrid optimization strategy for job-shop scheduling problems. Comput Oper Res