The Critical Plant Manager

'We understand your need to effectively manage your assets'

JAHCon
Physical Asset Management Pty. Ltd.

Newsletter

September 2011

A newsletter from JAHCon Physical Asset Management Pty. Ltd. to keep our current and potential clients informed of our ongoing activities and to raise awareness of how JAHCon may be able to help your organisation meet its Asset Management needs.

This newsletter also provides a forum for sharing Asset Management ideas and experiences.

Documentation Integrity

An important aspect of any system development is the need to maintain a constant level of integrity in the methodologies used throughout the process. When developing critical systems such as maintenance plans for critical equipment, critical function tests, critical operating instructions etc. the methodology must be adequate and consistent throughout. Failure to maintain the necessary level of system integrity means the overall program integrity is reduced.

An example came to light recently where draft maintenance plans created using FMEA principles were being reviewed by third parties without the use of a documented review procedure. The fact that changes were being made to the draft maintenance plans using this informal review process, means the overall integrity of the final maintenance plans are reduced.

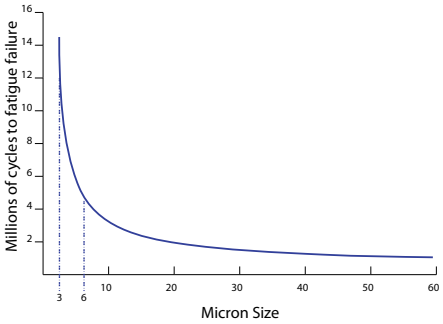
Any objective audit of the total development process would have to conclude the resulting maintenance plans were compromised by this approach.

Precision Maintenance

Managing critical fluid contamination levels is a major part of achieving Precision Maintenance in a modern plant. Critical fluids can include a wide range of fluid types and applications but lubricating oils and hydraulic oils are two of the most common.

What constitutes a well managed fluid will depend upon the design specifications of the application and the capabilities of the fluid. If the fluid is operating at the limits of its capabilities because of load, temperature etc. the management of the fluid will likely be more difficult than if the fluid was operating well within its limits.

What constitutes 'managing' the fluid can take many forms with cleanliness control, heat control, prevention of chemical attack etc. being typical examples.



Typical considerations for lubricating and hydraulic oils include the need to minimise debris levels, maintain the fluid within design temperatures and prevent breakdown of the fluid by chemical attack amongst others.

The adjacent graph is one example of the well known Macpherson Curve which shows the link between rolling element bearing fatigue life and wear particle size. In this example rolling bearing life can be increased substantially by preventing particle size from getting above approximately 3 micron. The curve also shows that a significant improvement in bearing life can be achieved by minimising contaminant size generally.

The practical means of minimising contaminant size are many and varied with a combination of lube oil cleanliness in storage, minimising contamination during transfer, effective filtering, timely oil and filter changes etc. all contributing to a particular target cleanliness level.

...to be continued

Training News

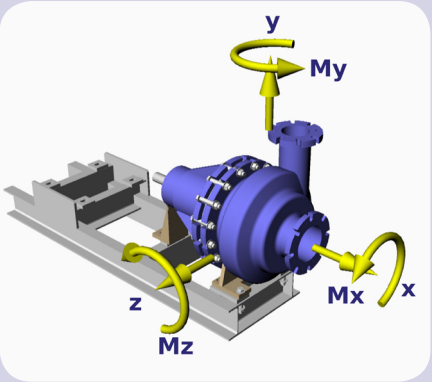
NOTE: The September Planning and Scheduling courses in Vietnam were postponed due to inadequate numbers by the close-off date. New dates will be posted when confirmed.

Training courses in 2011 to be presented by JAHCon on behalf of IQPC have been scheduled for the following dates and places. Subject to condition on the ground in NZ courses will be scheduled there later in the year.

DATE	COURSE NAME	VENUE	STATUS
25th - 26th April	Introduction to Planning & Scheduling	Kuala Lumpur, Malaysia	Completed
27th - 28th April	Advanced Planning & Scheduling	Kuala Lumpur, Malaysia	Completed
20th - 21st June	Introduction to Condition Monitoring	Kuala Lumpur, Malaysia	Postponed
22nd - 23rd June	Advanced Condition Monitoring	Kuala Lumpur, Malaysia	Postponed
12th - 13th Sep.	Introduction to Planning & Scheduling	Ho Chi Min City, Vietnam	Postponed
14th - 15th Sep.	Advanced Planning & Scheduling	Ho Chi Min City, Vietnam	Postponed
7th - 8th Nov.	Introduction to Condition Monitoring	Ho Chi Min City, Vietnam	Yes
9th - 10th Nov.	Advanced Condition Monitoring	Ho Chi Min City, Vietnam	Yes

Applying Precision Maintenance - Direct drive pumps

Previously I discussed the need for sound foundations under equipment as a first step in achieving Precision Maintenance. In this edition I would like to discuss a common omission in single suction pump installations, especially in the Pulp & Paper industry, that has a significant negative impact on the drive alignment. This problem arises because project and maintenance personnel sometimes omit the Drive End (DE) leg under the pump on the mistaken belief that it is optional (probably because some manufacturers identify it as such). Note that some pumps (e.g. API) do not have this leg and are still constrained fully.



If we consider the six degrees of freedom shown in the image on the right, the DE leg primarily restrains the pump from rotating around the 'z' axis. This 'z-axis' restraint limits the vertical displacement of the coupling and shaft to within the design limits of the pump. Without this restraint the vertical movement of the shaft can be many times the alignment tolerance for the drive. Measurements taken on a Clarifier pump reached 18 mm/s and 14 mm/s on a screen pump, both at running speed. This movement can be made worse by some coupling designs. ...to be continued.

The Asset Management Cycle - 'Build & Install'

On completion of the detailed engineering design phase, the construction and installation of the plant can begin. Only when all aspects of the plant have been subject to detailed analysis and planning should the build phase be undertaken. The cost of making changes to the plant after some, or all, of the components have been purchased and installed can be considerable. The lack of proper planning implicit in such late changes means that the change is rarely cost effective or well thought out. In many cases cost and time over-runs can be shown to relate to poor initial planning.

A detailed project plan outlining the steps to be followed and the resources needed to construct the plant is a vital component of any successful project. This plan must be set out in sufficient detail to eliminate ambiguity and minimise the likelihood of confusion, mistakes and litigation. The project plan should consider the following issues amongst others.

Responsibilities schedule:

A document detailing individuals (or roles) responsible for specific tasks in the project should be established at the outset. Clear responsibilities and authorities should be documented and communicated to all involved. Failure to assign responsibilities for specific tasks means that parts of the project will have no 'owner' or worse, they have multiple 'owners'. In either case the likelihood of problems arising during the project increase as confusion about responsibilities and authorities can occur.

Components procurement plan:

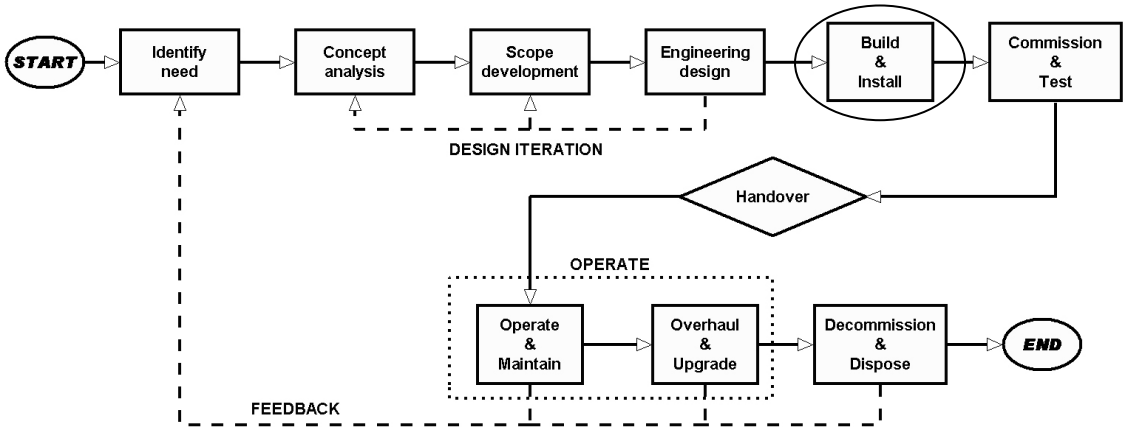
This plan should include make, model, size, and any other specifications or configurations necessary for the application of the equipment to the project. Agreed costs and support services should be included to ensure that those charged with purchasing the equipment know what to specify when ordering and how to determine if the delivery is complete. This is to ensure you get what you specify.

Milestones schedule:

This schedule should include the dates and times at which various stages of the plan must be completed. Selection of equipment, component ordering, delivery dates, etc.

Budget management:

This should itemise the cost of individual equipment and services as well as the total cost of the project and include the dates and times when these are to be supplied on site. Preferred dates and latest dates should be identified and penalties that apply for late delivery clearly established and communicated to suppliers. A partial and total payment schedule must also be included as this impacts cash flow.



Engineering standards:

Engineering standards must be in place for the specification, and procurement of plant and equipment. Poor engineering standards will compromise the through-life capacity of the plant and lead to increased down time and elevated costs. Engineering standards are required for all significant and non-standard activities that are not covered by national or international standards. ...to be continued

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