THE 24/7/365 PUMP

EXARRO PRETORIA EMBARKED ON A PROJECT WHERE 4 X NT150-400/1 PUMP SETS, ELECTRICALLY DRIVEN WERE TO PROVIDE COOLING WATER TO A SOPHISTICATED FURNACE.

This was the easy part as this is considered as standard practice, they also required a mains failure Diesel driven pump set which would operate in the event that the power was interrupted.

Again a reasonably, straight forward request.

The equipment was manufactured and eventually delivered to their site in Pretoria West.

At this point the plant engineer decided that he was not confident with the mains failure Diesel pump set and felt that in the event that for some unknown reason the Diesel set failed to start, they would loose the furnace which is worth millions.

He then requested Rapid to provide a solution to his problem where he could rule out any possibility of the Diesel set failing to start.

We looked at the present installation, and considered the clients concern, and decided to offer what we thought would be the best option.

If we operated the Diesel engine on a 24/7/365 continuous method we would rule out the possibility of the engine not starting in the event of a power outage.

However, the Diesel engine would not be capable of providing the necessary cooling water and for that reason we would have to operate the Diesel set with the various electrical pump sets, this was not economically viable as the fuel consumption would be extremely high, and the fuel tanks provided initially would have to kept full on a daily basis, again not really practical.

This was becoming a headache, as we had to keep the engine operating 24/7 which meant that would not have go through the starting sequence in the event of a power failure, but at the same time the pump was not rated for the full cooling water requirements.

SOLUTION

We looked at various options and came up with what we thought was the best, most practical solution to the matter.

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We would firstly operate the engine at 1000RPM at this speed the fuel consumption was at a minimum and the existing fuel tank would provide at least a one week window before requiring refuelling.

Secondly at this speed the pump would generate a very low flow rate and discharge pressure which in turn resulted in the power consumption from the Diesel engine being very low.

However we could not operate the pump at a closed valve pressure so we designed a bypass from the pump discharge, back to the suction holding tank. This would ensure that the pump would not over heat, and more importantly operate the pump more to the right hand side of the performance curve where we would not incur internal recalculation and radial reaction which is common when pumps are operated to the left hand side of the performance curve.

Now whilst this all might sound clever and technical we were left with the question as to what will happen in the event of a power failure, when we required the Diesel set to operate at it's maximum speed 1950RPM, considering the fact that when the power is connected the engine set will be idling at 1000RPM.

Well we changed the mains failure procedure completely around!

The engine speed is controlled by a solenoid switch which whist the mains power is provided it holds the engine throttle to the idle position.

However in the event that the power fails the solenoid valve which relies on the mains power will switch off and release the throttle, which is of course spring loaded and the spring will advance the throttle to the maximum speed in a millisecond, resulting in full power being delivered to the pump.

The same principle will apply to the bypass system which is controlled by an actuated butter fly valve and will close when mains power is not present.

This pump set is operating in Pretoria as we speak and I can inform you that the Exarro Management are happy with the installation and do not have to be concerned should the power fail, as the Diesel engine is running already and there is no need to start it.

BRILLIANT.

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