7.0 Conclusion

Nowadays predictive maintenance of machines plays a considerable role since that gives a lot of advantages to the system. Condition monitoring is the key for the predictive maintenance. The condition and performance monitoring of turbines , generators associated components has become very important tool in maintenance engineering. In general, critical machinery would require scheduled shutdown periods for preventive maintenance. This approach is not only costly but has actually been known to reduce reliability by disturbing elements which are perfectly well or by introducing faults during dismantling and assembly. With condition monitoring , measurements are taken from which the state of the machine can be predicted before a catasphoric failure. With the improvement of predictive maintenance benefits like improved efficiency, low preventive maintenance, safety etc. can be expected.

Microlog CMVA60 is a system developed to improve predictive maintenance. This system gives the condition of the rotating parts as well as the supports and foundation of the generator. The detection of rough load zone is also based on that foundation. The reliability and the accuracy of the rough load detection system depends on the vibration analysis system which is used.

It was clearly seen that the above system gives quiet reliable readings when compared with the Microlog CMVA 60 system. The maximum level of vibration limit was taken by multiplying with the factor 1.5 is an approximation made. This can be varied according to the real values of the particular machine vibration levels.

One of the difficulties faced during this period of study was difficulty in releasing the particular machine for testing due to higher cost incurred. Therefore the only option available was to wait until a machine startor stop time arrives naturally .

There is only one Microlog CMVA 60 system for the whole Mahaweli Ganga Complex which has about 6 power stations and around 20 machines. This made a huge difficulty in reserving the Microlog CMVA 60 system for this particular study because it was not meant for this particular job.

Sometimes the operator feels no vibration but the detector shows some level of vibration, which lead to reduce the confidence of the operator. In order to clear this doubt it was verified with the original CMVA60 system.

Even though the operator communicate with the system despatch centre sometimes they neglect or refuse to change the level of loading.

It can be recommended to replace this analog circuit with a digital circuit to get more accurate and better results.

References

[1] S.L.Uppal, "Electrical power" ,Thirteenth edition, pp133-159, in1988.

[2] J. Guthrie Brown "Hydro-Electric Engineering practice", vol. 2 Mechanical & Electrical Engineering, second edition, pp85-121, in 1970.

[3] P.L.Ballaney, "Theory of Machines", tenth edition, pp 978-1032, in1979.

[4] R.M.Arston, "Electronic Engineering hand book" in 1992.

[5] http://www.plant-maintenance.com /index [Plant maintenance resource center]

[6] http://www.vibrationresearch.com [Vibration Research Corporation, Michigan]

[7] http://www.vib.com [VSC Vibration analysis]

[8] http://www.vitech-apac.com/shop/ [DLI Engineering corporation]

[9] http://www.vibinst.org/vibezonenew-tec.html [Vibration Institute]

[10] http://www.ieee.org/pubs/spectrum/9906/non.html [Publications]

[11] http://www.IAHRtemplate.htm "Stanislav Pejovic, trouble shooting of turbine vortex core resonance & air introduction into the draft tube"