3. Engine life saving occurs because the new data acquisition system determines precisely the point where the engine meets the required minimum performance limits and this point corresponds to a maximum EGT (Exhaust Gas Temperature). Higher EGT diminishes the engine life and when the new system finds a lower EGT point where still the minimum performance limits are satisfied, engine life will be longer.
4. Operational Safety is much enhanced. The automatic checking of data acquired provides the operator with the "cautionary" and "alert" indications of unsafe operating conditions. This system monitors all the significant parameters more accurately at the specified limit than it can be achieved by an operator with conventional instruments, thus reducing the probability of reaching operating levels which would overstress the engine.
5. Analysis capability is enhanced. The data that are stored during the test provides enormous potential for further analysis.

4 CONCLUSION

An application of a computerized data acquisition system in testing of an auxiliary power unit is made. Compared to manual testing, manual recording and manual calculations in old system, new computerized data acquisition system provided significant reduction in test times (more than 50%) and similar reductions in fuel and labour costs are obtained. Improved test reliability, repeatability and more consistency between engines are also achieved. Engine life, operational safety and analysis capability are enhanced.

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REFERENCES

[1] D.M. Rudnitski, "Performance Derivation of Turbojets and Turbofans From Tests in Sea Level Test Cells", AGARD-LS-132, 1984.
[2] M. Holmes, P.G. Booker and B.M. Watts , "Data acquisition and processing in sea level test beds", AGARD-LS-132, 1984.
[3] A.A. Okafor, C.H. Achebe, J.L. Chukwuneke, P.C. Okolie, "Experimental Simulation and Optimization of Performance of Four Stroke Spark Ignition Injector Engine" International Journal of Scientific & Engineering Research, vol. 5, iss. 11, Nov. 2014.
[4] A. Hossain, S.K. Das, S. Hossain, "Fabrication & Performance Test of a Low Temperature Differential Stirling Engine" International Journal of Scientific & Engineering Research, vol. 5, iss. 1, Jan. 2014.
[5] A. Srinivasan, K. Tharanisingh, K. Alagarsamy, S. Sundaravaradan, "Testing and Analysis of the Correlation between Engine performance and Engine life", International Journal of Scientific & Engineering Research, vol. 5, iss. 10, Oct. 2014.
[6] A. Dinc, "Design and implementation of a data acquisition system for testing of gas turbine engines", MS Thesis, Middle East Technical University, Graduate School of Natural and Applied Sciences, Turkey, 1995.
[7] A. Dinc, "Design and Implementation of a Data Acquisition System for Testing of Gas Turbine Engines", Journal of Multidisciplinary Engineering Science and Technology, Vol. 2 Iss. 3, Mar. 2015.
[8] http://commons.wikimedia.org/wiki/File:GTC85-90_b.JPG, 2015.
[9] Airesearch Manufacturing Company Of Arizona, "Training Manual GTC85 Series Gas Turbine Compressor Engine", TSG-28
[10] Garrett, "Technical Manual Model GTCP85", TO 2G-GTCP85-41-1, (1992)
[11] https://www.flickr.com/photos/37467370@N08/7460234272, 2015.
[12] Hewlett Packard, HP VEE User Manual, 1993.