

# IPACS Australia

International Project And Consulting Services - Industrial Engineers & Performance Consultants  
**Commercial in Confidence**

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**Mr. Kailash N SRIRAM**  
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**Reference letter for IPACS Australia's software and systems for aircraft turbine engine trouble shooting, engine signature and performance analysis and advanced fault diagnostics.**

PO Box 185 Export Park  
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Dear Kailash,

Tel: +61 8 8150 0200  
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As IPACS Australia you have successfully designed and tested a technology for aircraft engine signature and performance analysis applications including automatic trending of component performance and fault tree diagnostics. This extensive development program was carried out in our OEM approved aircraft turbine engine test facility in Adelaide.

[www.tenix.com](http://www.tenix.com)

I am happy for you to use this letter as a proof of evidence of your achievement.

Some of the features you developed & tested here included:

Engine component database modelling, miniature tri-axial sensors insulated to resist high temperatures without loss of signals, tri-axial signal capture, multi-point simultaneous data capture, spectral analysis of defects and their disturbance frequencies, specially advanced analysis of numerous harmonics of the disturbance frequencies in all the 3-axis as well as radial/tangential/vertical-horizontal of all components, trending of the fault generation in real time, visualisation of the components performance in real time, diagnostics and advanced analysis features under varying loads and speed conditions, OPC operational data gating acquired direct from the control panel, vector analysis for tracing abnormalities, bearing internal individual component fault trending and diagnostics, trouble shooting, root cause analysis etc.

I look forward to you further enhancing your technology to include your proposed multi-variate data modelling techniques for predicting operating parameters and the isolation of abnormalities, wireless sensors for online data capture, online real time performance trending and auto-diagnostics with advanced analysis.

We strongly support your plans for further trials so as to introduce these systems to the aircraft industry by designing and implementing compact systems for health monitoring and prognostics of aircraft engines and airframe response. We will be happy to assist you in any way we can.

Yours sincerely,

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