

ABSTRAK

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Judul Proyek Akhir : ANALISIS *PROGRAM ENGINE HEALTH ASSESSMENT (EHA)* PADA *ENGINE CFM56-7B* PESAWAT BOEING 737-800 *NEXT GENERATION*

Keandalan *engine* merupakan faktor penting dalam menjaga keselamatan dan efisiensi operasional pesawat. Pada Boeing 737-800 *Next Generation*, *engine* CFM56-7B berperan sebagai sistem propulsi utama yang performanya perlu dipantau secara berkala. Seiring bertambahnya jam terbang, *engine* mengalami degradasi yang ditandai dengan peningkatan temperatur gas buang, konsumsi oli, serta munculnya pesan masalah dari Kontrol Elektronik *Engine (EEC)*. Untuk mengantisipasi hal tersebut, diterapkan program *Engine Health Assessment (EHA)* sebagai bagian dari Program Keandalan *Engine (ERP)* untuk menilai kondisi *engine* dan memberikan rekomendasi teknis secara periodik.

Penelitian ini bertujuan untuk menganalisis pelaksanaan program EHA pada *engine* CFM56-7B dan menilai efektivitasnya terhadap keandalan operasional pesawat. Analisis dilakukan terhadap sepuluh *engine* dengan membandingkan data EHA-CFM56-7B-11-II-2025 dan EHA-CFM56-7B-10-I-2025, yang terdiri dari daftar Pengawasan tindakan *EEC*, laporan pengawasan, dan inspeksi *Borescope*. Parameter utama yang dikaji meliputi batas *EGT*, tekanan oli, tingkat konsumsi oli, dan tingkat vibrasi, yang dikorelasikan dengan hasil inspeksi dan pesan masalah. Metode penelitian bersifat deskriptif-komparatif dengan pendekatan kuantitatif dan kualitatif, menggunakan perbandingan data sebelum dan sesudah EHA serta batas referensi dari *Aircraft Maintenance Manual (AMM)* dan *Fault Isolation Manual (FIM)*.

Hasil penelitian menunjukkan bahwa pelaksanaan EHA berpengaruh signifikan terhadap peningkatan kondisi dan peringkat kesehatan *engine*. Sebagian besar *engine* mengalami perbaikan setelah tindak lanjut rekomendasi teknis dari Powerplant Engineering, seperti penggantian *EEC*, kabel-kabel, dan pelaksanaan

Fault Isolation Manual (FIM). Kesalahan dengan kategori pendek berhasil diselesaikan, sedangkan kategori panjang dan ekonomis, tetap dalam pemantauan. Perubahan ini meningkatkan nilai urutan *engine* dan efektivitas program EHA dalam mendeteksi degradasi dini. Dengan demikian, implementasi EHA pada *engine* CFM56-7B terbukti mendukung peningkatan keandalan *engine* dan efektivitas pelaksanaan perawatan prediktif pada pesawat Boeing 737-800 *Next Generation*.

Kata Kunci: *Engine Health Assessment*, CFM56-7B, batas *EGT* , Pesan masalah *EEC* , Perawatan Prediktif

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Engine reliability is a critical factor in maintaining the safety and operational efficiency of aircraft. On Boeing 737-800 Next Generation aircraft, the CFM56-7B engine serves as the main propulsion system whose performance must be continuously monitored. As flight hours and cycles increase, engine degradation occurs, indicated by rising *Exhaust Gas Temperature (EGT)*, oil consumption, and *Electronic Engine Control (EEC)* fault messages. To address these issues, the *Engine Health Assessment (EHA)* program is implemented as part of the *Engine Reliability Program (ERP)* to periodically evaluate engine health and provide technical recommendations.

This study aims to analyze the implementation of the EHA program on CFM56-7B engines and evaluate its effectiveness in supporting aircraft operational reliability. The analysis focuses on ten selected engines using compares data from EHA-CFM56-7B-11-II-2025 and EHA-CFM56-7B-10-I-2025, consist of *EEC Action Control List*, *On-Watch Report*, and *Borecope Inspection (BSI)* results. Key parameters assessed include *EGT margin*, *oil pressure*, *oil consumption rate*, and *vibration level*, correlated with inspection findings and fault messages. The research adopts a descriptive-comparative method with both quantitative and qualitative approaches, comparing *before* and *after* EHA data based on reference limits from the *Aircraft Maintenance Manual (AMM)* and *Fault Isolation Manual (FIM)*.

The results show that the EHA program significantly improved engine condition and ranking performance. Most engines demonstrated positive trends after implementing engineering recommendations such as *EEC* and harness replacements or functional inspections based on *FIM*. Faults categorized as *short* were successfully resolved, while *long and economic* faults remain under

monitoring. These improvements enhanced the *engine health ranking* and confirmed the EHA program's effectiveness in early fault detection. In conclusion, the EHA implementation on CFM56-7B engines has proven effective in improving diagnostic accuracy, supporting predictive maintenance, and strengthening the reliability of Boeing 737-800 Next Generation aircraft.

Keywords: Engine Health Assessment, CFM56-7B, EGT Margin, EEC Fault, Predictive Maintenance.