Abstract

The Decoupling of Corrosion and Fatigue for Aircraft Service Life Management [†]

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Abstract: Metal fatigue management is generally well understood as reflected in the Aircraft Structural Integrity Management Plans, which, in some cases, consider environmental degradation prevention; however, limited provisions beyond *find and fix* exist for corrosion repair. Thus, the repair of corrosion can be a major undertaking, through life cost driver and an aircraft availability degrader. This *find and fix* approach exists largely because tools are too immature to accurately assess the structural significance of corrosion when it is detected. This presentation shows that fatigue and corrosion are decoupled for aircraft in general through the analysis of some in-service cracking cases. Corrosion occurs on the ground, whilst fatigue cycling occurs at altitude. This important observation allows fatigue and corrosion to be considered separately. This work aims to provide a crack growth basis for the justification of allowing detected pitting corrosion to remain in service for a limited period before repair.

Keywords: aircraft fatigue; corrosion pits; crack growth

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