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Monte-Carlo Simulation of Birdstrike to Support Rule Making for Large Birds

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A clear need was established by the aero-engine manufacturers and the certifying authorities for a re-assessment of the published rules governing engine certification for large flocking birds. A task group was set up to address this need at the beginning of 2000. Early in this program, it was determined that a statistical approach to the rule making was required and the Monte-Carlo technique was proposed and accepted. This paper discusses the implementation of the Monte-Carlo technique to simulate bird strike events from the Rolls-Royce viewpoint and describes the various refinements that have been made in order to ensure an adequate comparison with observed service data. Subsequent to this benchmarking process, the results from the analysis have been used to calculate engine shut-down rates for various proposed large bird rule scenarios ultimately leading to the acceptance of a new flocking bird certification requirement for engines of inlet area of 2.5m² and above. In addition, the analysis has been used extensively within Rolls-Royce to conduct theoretical bird strike studies.