

AAIB Report: Modified Piper PA-46-350P (G-HYZA), Loss of power from hydrogen fuel cells to the electrical propulsion system while undertaking an experimental flight.

News story

During an experimental flight of an aircraft with an electrical propulsion system, with electrical power from hydrogen fuel cells, it experienced a loss of power to the electrical motors. A forced landing was carried out close to Cranfield airfield in Bedfordshire on 29 April 2021.



During an experimental flight near Cranfield Airport of a modified Piper PA-46-350P (G-HYZA), an electrically powered aircraft with electrical power from hydrogen fuel cells, suffered a loss of power to the electrical motors. This meant a forced landing was carried out, which severely damaged the aircraft, the crew were unharmed.

The loss of power occurred during an interruption of the power supply when, as part of the test procedure, the battery was selected to OFF with the intention of leaving the electrical motors solely powered by the hydrogen fuel cell. During this interruption, the windmilling propeller on the aircraft generated voltage that was high enough to operate the inverter protection system. This then locked out the power to the motors and the pilot and observer were unable to reset the system and restore electrical power.

A number of factors contributed to the accident:

- Sufficient ground testing had not been carried out to determine the effect of the back voltage from a windmilling propeller on the inverter protection system.

- The emergency procedure to clear an inverter lock out after the protection system operated was ineffective.
- An investigation had not been carried out into a previous loss of power resulting from an inverter lock out, which occurred three flights prior to the accident flight.
- The risk assessment had not been reviewed following the loss of propulsion on two previous flights.
- Ad hoc changes were made to the flight test plan, including the position where the electrical power source was switched, without the knowledge of the competent person.
- The competent person's involvement was restricted in a number of areas due to issues within the organisational relationships, the fast tempo of the project, other work commitments and restrictions from the COVID-19 pandemic.
- The operator's chief executive and the flight test director took on the day-to-day management responsibility for much of the programme. However neither individual had the necessary safety and flight test experience for that role and their focus was primarily on meeting key project targets.

Five Safety Recommendations are made, and the operator has also taken Safety Action to address a number of findings from the accident.

[Read the report.](#)

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