



# EA Technology

## Report on HFE (Formally SPOSS)

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## **Evaluation of the Fairford SPOSS Motor Controller for the Energy Efficiency Standards of Performance Scheme**

The Energy Efficiency Standards of Performance (EESoP) scheme is part of the regulatory instrument resulting from the 1994 Supply Regulation review by the Office of Electricity Regulation (OFFER). This provides a total of approximately £100 million of 'pass through' costs to implement the scheme throughout the UK, with the goal of reducing carbon emission through reduction of electricity consumption totalling nearly 6000 GWh. At the request of UK Electricity Companies, EA Technology has conducted a number of evaluations of energy saving products for the EESoP scheme. Through this scheme, Public Electricity Suppliers must demonstrate to the Energy Saving Trust that they have found cost effective schemes for 'pump priming' of energy efficiency for customers with small electricity consumption.

EA Technology have evaluated a number of electronic motor control devices which are claimed to reduce the energy consumption in commercial refrigeration for EESoP purposes. Results from these trials relate only to the use of such devices on chest-type freezers with hermetically sealed refrigeration circuits, typically rated between 180 and 1000 Watts. Electronic Motor Controllers (EMC) save energy in such applications by sensing part loading of the refrigeration circuit motor and reducing the effective terminal voltage to reduce motor iron losses. Although not technically proven, it is believed that additional energy saving benefit occurs in hermetically sealed refrigeration circuits due to motor cooling being provided by the refrigerant, potentially multiplying savings by the circuit coefficient of performance.

Tests of various EMC devices were conducted by back-to-back monitoring of pairs of commercial freezer cabinets under controlled temperature conditions. Simulated freezer loading was provided by regular replacement of water loads representing operational conditions. Each freezer pair was monitored in detail for energy consumption and for maintenance of specified cooling temperature. The EMC devices were swapped between freezer pairs during the trial period. Through the test programme, energy savings due to the use of EMC could be accurately determined whilst eliminating differences naturally found between apparently identical freezers.

The Fairford SPOSS device performed well, demonstrating that similar freezer temperatures were maintained when the device was installed and that savings of between 10 and 18% were obtained. Actual savings obtained may vary between different makes of freezer and sometimes between apparently identical freezers.

Simon Redford, Manager, Demand Management and Business Strategy Group, EA Technology

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