

Limassol,
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Subject:
Investigation of the FP-5700
malfunction on-board the vessel
“McEwen”

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1. Introduction

The aim is to identify the malfunction origin of the FP-5700 condensed aerosol generator that took place on-board the vessel McEwen.

2. Witnesses

FirePro Systems representatives:

Dr Ghigo Gianfilippi De Parenti – Executive Director
Mr Andy Neophytou – Production Manager
Mr Demetris Constantinou – Senior Business Development Manager
Dr Ioannis Lambrou – R&D Project Manager

3. Investigation Conclusions

The evidence collected during the preliminary investigation regarding the malfunction of a falsely activated FP-5700 condensed aerosol generator led to the following conclusions, Figure 1:

- The unit (manufactured in April 2016 with serial number 151668) malfunctioned during operation (after activation).
- The malfunction was caused due to failure of the internal housing assembly shortly after the unit's activation and before the end of discharge. The evidence suggests that the rivets securing in place the cover of the internal housing failed unexpectedly during operation. Further investigation would focus on the origin of the rivet failure.
- This phenomenon resulted in flooding the external housing with ceramic spherical cooling material (thus blocking the aerosol's path) causing excessive pressure build-up inside the unit and leading to the breach of the generator's housing.





Figure 1: FP-5700 in-service malfunction; a) Deformed external housing, b) Cooling material observed in the aerosol exit path, c) Internal housing failure, d) Internal and external rivet samples, e) slots on internal housing's plate indicating that there was no resistance from the rivets prior to the plate being detached.

The role of environmental factors in the malfunction of the FP-5700 generator was investigated by assessing the state and performance of the FP-2000 generator installed in the same enclosure:

The FP-2000 condensed aerosol generator was disassembled, Figure 2, with the findings suggesting zero environmental factor effect on the generator components and compound.



Figure 2: (a-b)FP-2000 generator, (c-f) FP-2000 disassembled internal housing.

Following the generator`s reassembly, a performance test was run. The FP-2000 generators performed according to its specifications, Table 1 and Figure 3.

Table 1: FP-2000 performance data.

FP-2000	R (Ω)	Weight before (g)	Weight after (g)	Efficiency (%)	Discharge Time (s)	Max. Temp at 10cm ($^{\circ}\text{C}$)
131454	2.2	15570	14250	66.0	18	\approx 270

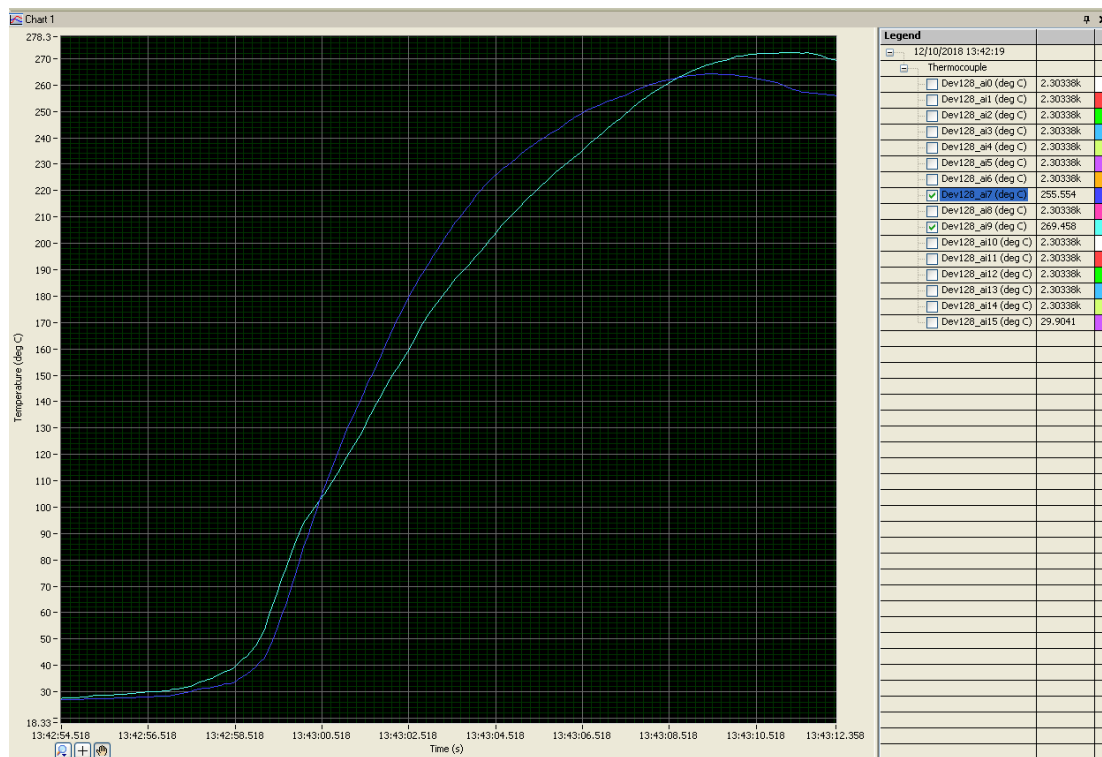


Figure 3: FP-2000 performance test - Aerosol temperature at 10 cm from the generator outlets.

