2026 Electrical/electronic (servoregulation)

Permission to print:	Yes
Category	Electrical / electronic
Category 2	Pump Servoregulation
Severity	Good Catch Near Miss
Description:	13-minutes into starting CPB in an adult patient, the bubble alarm activated twice within one minute. The arterial pump stopped and the venous and arterial lines were clamped immediately. This was a reoperation with initiation of CPB femorally. The initiation of CPB was unremarkable. Nine minutes before the bubble alarm activation, VAVD was initiated to improve venous drainage and right heart decompression for sternotomy; six minut es prior, filtration [adsorption] via a deaired cytosorb was initiated. The incident occurred prior to the cross-clamp being applied. The HLM in use was an ESSENZ which is approximately 12-months old. Disposable equipment was an Inspire 6F with an integrated arterial line filter and an Inspire hardshell venous reservoir. The circuit was flushed with CO2 before priming. After priming the circuit was adequately deaired, with no bubble alarm activations pre-CPB other than the normal safety check. All taps and connections were secure, all ties were on in the correct locations, there were no visible leaks of blood or prime.
GOOD CATCH - what went well	In both activations, the patient was quickly isolated from the circuit and the surgical team informed. The perfusion coordinator was called to assist. The circuit was checked for air by the Lead Perfusionist and the Surgeon simultaneously, with no air visible in the circuit. CPB was reinitiated promptly as the risk of genuine air embolism was ruled out. A second, more experienced Perfusionist promptly attended with two minutes and inspected the circuit confirming no visible air or source of air. The Lead Perfusionist requested NIRS be applied to the patient as a precaution with readings maintained within the normal range for the duration of the case. The first NIRS reading was obtained within 30-seconds of the second bubble alarm activation and was 70% on the left and 75% on the right. There were no further activations during the case. Emergency response procedures were effectively implemented as a team approach. The incident was debriefed at the weekly Perfusion meeting. There have been a few activations in adults I believe based on discussion at the team meeting, one may have been genuine.
What could we do better	Due to the sensitivity of the arterial pump controller on the ESSENZ, my standard practice is to unlink the venous electronic clamp from the arterial pump several minutes after CPB initiation (providing onset of CPB is unremarkable). I do this as during the low flow period prior to cross-clamp application, I have inadvertently hit 0-LPm and the arterial pump has stopped, clamping the venous line. I am highly aware of this as my normal practice and knew to manually clamp the venous line promptly, along with the arterial one, so as not to exsanguinate the patient. In future I could change my practice and keep the venous occluder stoplinked to the arterial pump as this is a good safety feature of the ESSENZ in the instance of a critical alarm activation.
Preventive actions	Documentation and monitoring of bubble alarm activation frequency in an adequately de-aired circuit to identify any trend of increasing false activations.
Type of incident:	Equipment
Manufacturer advised:	No

Discussed with team:	Yes
Hospital incident filed:	No
Ext Authority Advised	No
Patient outcome variance	Nil
Commentary	Unexplained arterial bubble sensor activation as described is very likely deemed not sufficiently significant to formally report and yet may not be infrequent as suspected here. These authors plan to formally monitor such events given these sensors are relatively new. There are anecdotal reports of software upgrades fixing this issue however of note on this instance the manufacturer had not been advised. While such events may be deemed minor, reporting to the industry is essential. PIRS Editorial team.