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Potential for Sensor Damage from Transient Over-Voltage Condition

Effectivity

All SBE 25 SEALOGGER CTDs.

Urgency

Moderate.

Description of Problem

When the SBE 25 main batteries are near their end of life, pump turn-on during normal operation can initiate system shut down due to low battery voltage (a normal CPU function). When this happens, the CPU turns off the pump at a time when the SBE 25s DC/DC converter is unable (due to the falling battery voltage) to provide proper control of the main output voltage. As a result, the main output voltage goes as high as 20 VDC for about 100 ms (less with more sensors loading down the supply). This over-voltage transient can potentially damage any sensors connected to the SBE 25.

The new Version 2 (with square wave output) SBE 3F temperature sensor is especially susceptible to damage if the over-voltage condition occurs. Version 2 temperature sensors have serial numbers of 032000 and above, and have been shipped with all SBE 25s since mid-1995. Older (Version 1) temperature sensors with serial numbers less than 032000 have not been affected, and we are unaware of damage actually occurring to other sensors. However, the potential does exist.

Precautions and Corrective Action

An immediate precaution is to insure the SBE 25 main battery is changed or re-charged before it reaches end-of-life. Because battery end-of-life is affected by temperature and load conditions (auxiliary sensors) it is not easy to determine this accurately. It is recommended that the main battery voltage be monitored frequently with the **DS** command and the batteries changed frequently. As long as the battery voltage is maintained at a high enough level for normal operation, the problem will not occur.

All users of SBE 25s with new Version 2 temperature sensors will be contacted directly regarding modifications to their SBE 25s. Users with Version 2 sensors will be asked to return the SBE 25 as soon as possible for modification.

For SBE 25 systems with Version 1 temperature sensors, modifications to the SBE 25 will be performed as they are returned for regular service and calibration. Those SBE 25 users that are not contacted directly should plan on returning the SBE 25 for modification during their next regularly scheduled calibration or service period.