**Additional File 1: Iterative testing ranges and intervals for signal thresholds and timing patterns that were identified from video observation**

*Signal magnitude components: threshold determination by iterative testing in training dataset*

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| **Component** | **Data Type tested** | **Sampling Rates (Hz)** | **Threshold range tested (units)** | **Testing interval (units)** |
| A | Heave-axis smoothed Jerk | 333  200  100  50  32  20  16 | 100 to 320 (m s-3)  80 to 260  70 to 200  60 to 150  50 to 130  40 to 120  40 to 80 | 10 (m s-3) |
|  | Triaxial norm Jerk (mean over 250ms window) | 333  200  100  50  32  20  16 | 150 to 500 (m s-3)  120 to 400  100 to 320  90 to 230  80 to 180  60 to 150  50 to 130 | 10 (m s-3) |
| B | Raw surge-axis acceleration | All | -0.4 to -1.2 | 0.1 |
|  | Estimated dynamic surge-axis acceleration | All | -0.3 to -1 | 0.1 |
|  | Triaxial norm Jerk | 333  200  100  50  32  20  16 | 150 to 500 (m s-3)  120 to 400  100 to 320  90 to 230  80 to 180  60 to 150  50 to 130 | 10 (m s-3) |
| C | Raw surge-axis acceleration | All | 0.8 to 1.4 | 0.1 |
|  | Estimated dynamic surge-axis acceleration | All | 0.7 to 1.2 | 0.1 |
|  | Triaxial norm Jerk | 333  200  100  50  32  20  16 | 150 to 500 (m s-3)  120 to 400  100 to 320  90 to 230  80 to 180  60 to 150  50 to 130 | 10 (m s-3) |

*Timing components*

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| **Timing component** | **Range tested (s)** | **Testing interval (s)** |
| Maximum time from end of signal *A* (when signal *A* ceases to exceed threshold) to beginning of signal *B* (where signal *B* begins to exceed threshold), when applicable | 0 to 0.4 | 0.02 (at 50-333 Hz); or 1/(Hz) at 16-32 Hz |
| Maximum time from end of signal B to beginning of signal C, when applicable | 0.25 to 0.75 | 0.05 (or 0.0625 at 16 Hz |
| Minimum total duration of signals A and B (beginning of signal A to end of signal B) | 0.01 to 0.1 | 0.01 (100-333 Hz); or 1/(Hz) at 16-50 Hz |