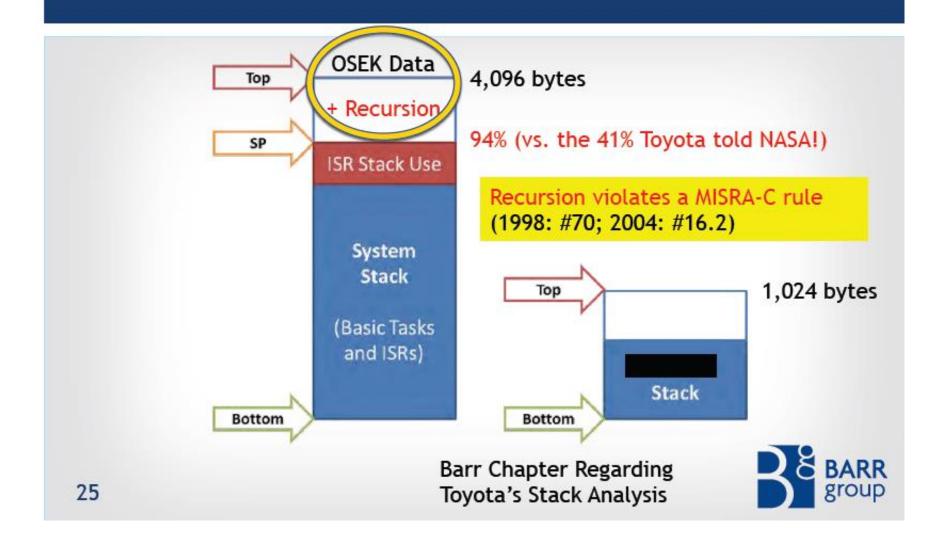
ELECTRONIC THROTTLE CONTROL (ETCS)

"Toyota ETCS-i is an example of a safety-critical hard real-time system." - NASA, Appendix A, p. 118 Throttle Accelerator Pedal Valve Position Sensors **ECM** Throttle Closed Loop **Control Motor** Throttie Control Throttle Throttle Position Command Feedback Select Sensors 1) Pedal Input 2) Idle Speed 3) Cruise Control Mass Air Flow **Fuel Injection** 4) Transmission 5) Stability Control Other Vehicle Ignition Coil Fail Safe Modes Sensors NASA, p. 13 10

http://embeddedgurus.com/state-space/2014/02/are-we-shooting-ourselves-in-the-foot-with-stack-overflow/

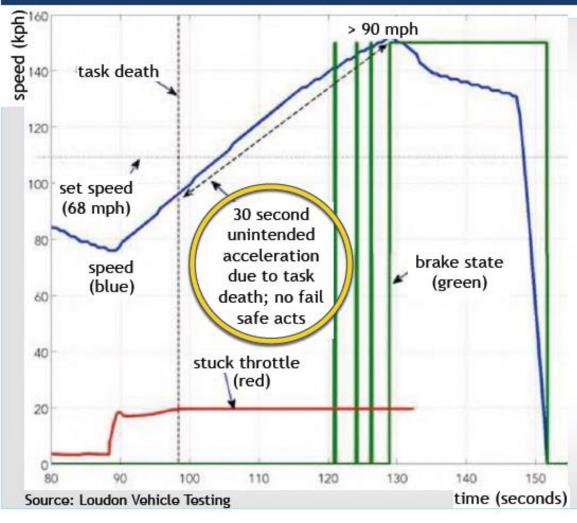
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STACK ANALYSIS FOR 2005 CAMRY L4



sws1

EXAMPLE OF UNINTENDED ACCELERATION



- Representative of task death in real-world
- Dead task also monitors accelerator pedal, so loss of throttle control
 Confirmed in tests
- ➤ When this task's death begins with brake press (any amount), driver must fully remove foot from brake to end UA
 ✓ Confirmed in tests



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