

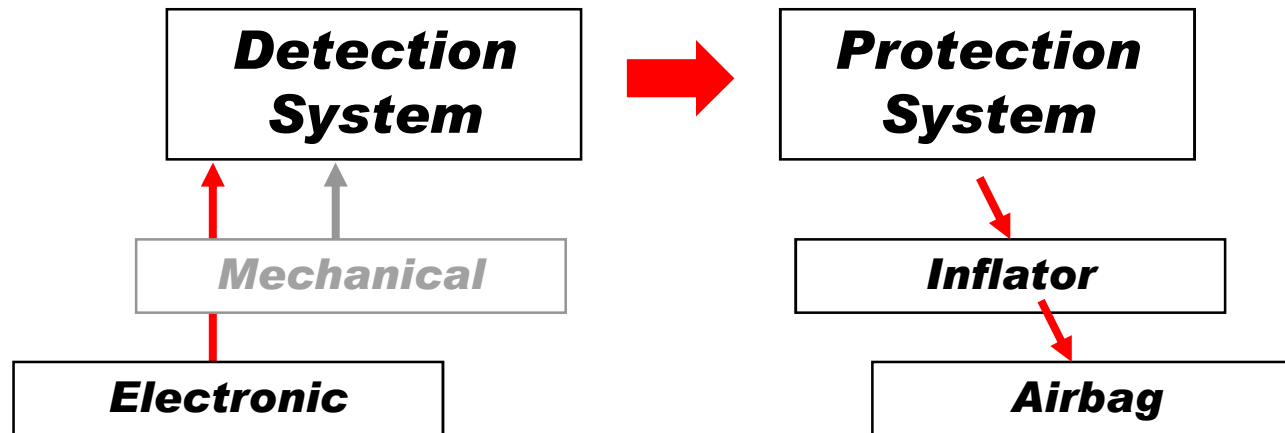


Development of an airbag system for Racing

TECH-AIR RACE

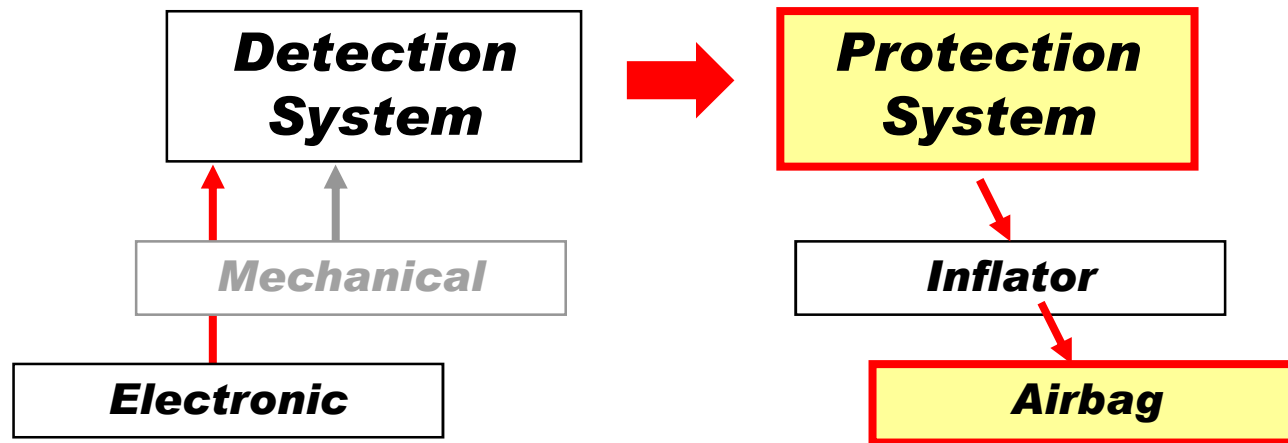
Colin Ballantyne – 4 July 2014

Components of an Active Safety System



TECH-STAR

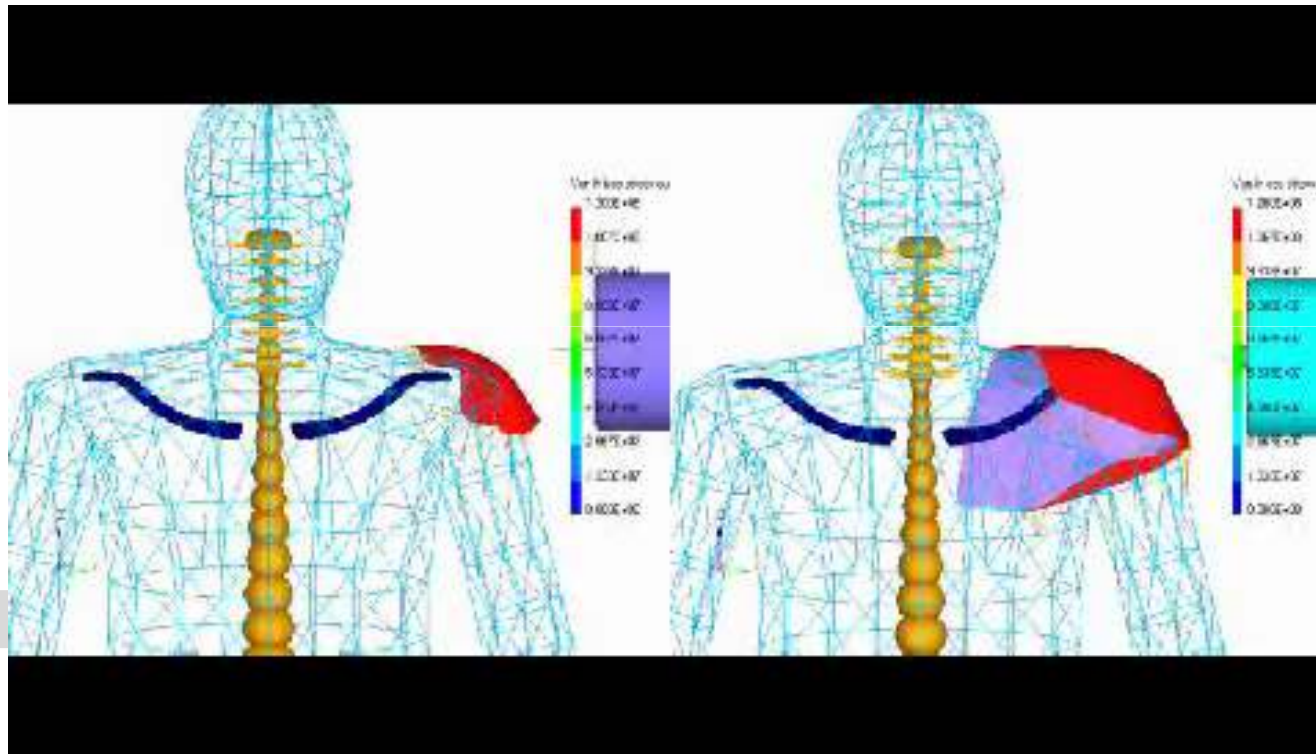
Components of an Active Safety System



Protection System - Airbag



- Shoulder Injuries most common (46%)
- Injury Simulations using MADYMO Software



- EN 1621-1 Impact performance on Shoulder:
 - 20kN Uninflated to 2.7kN Inflated

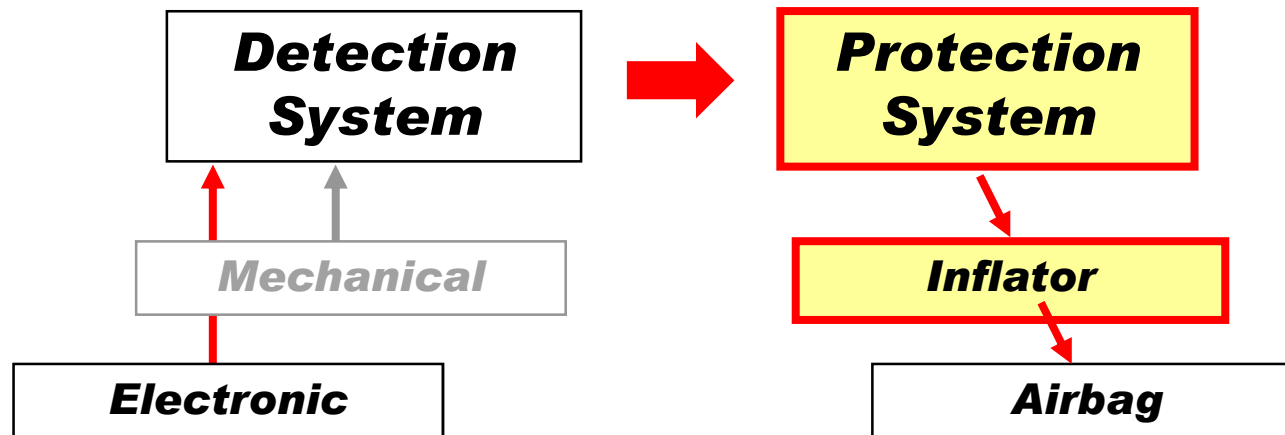
Protection System - Airbag



- Initial Airbag Prototypes



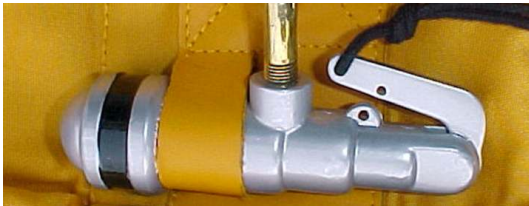
Components of an Active Safety System



Protection System - Inflator



- Common Gas Generator Types:



Cold Gas Only



Cold Gas – Pyrotechnic Activated

Cold + Hot Gas



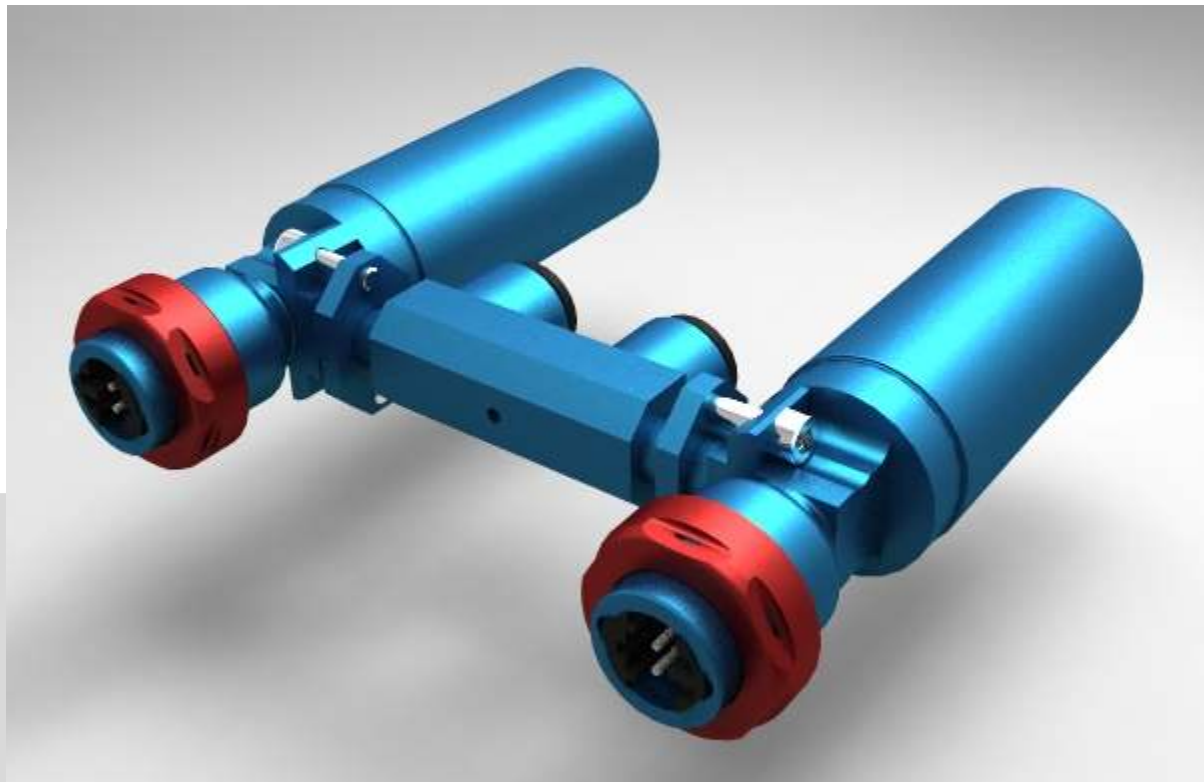
Hot Gas Only



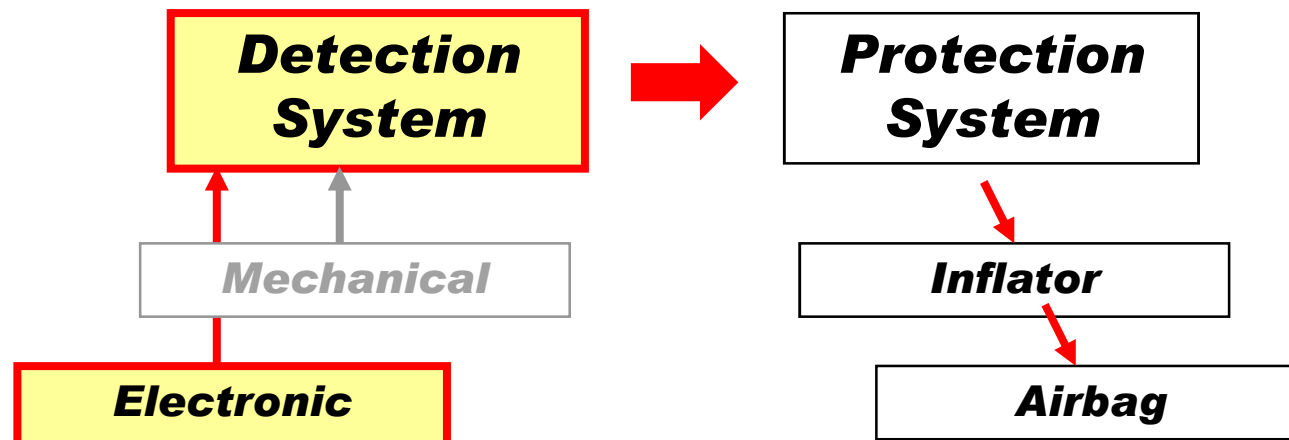
Protection System - Inflator



- Cold Gas – Pyrotechnically Activated Selected
- Patented Dual Charge configuration
- C Shape Design assists ventilation

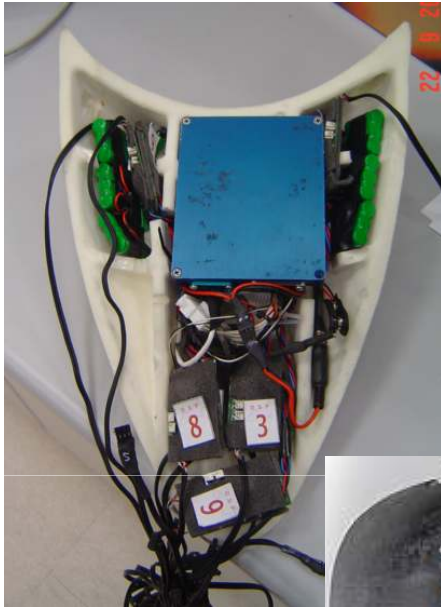


Components of an Active Safety System

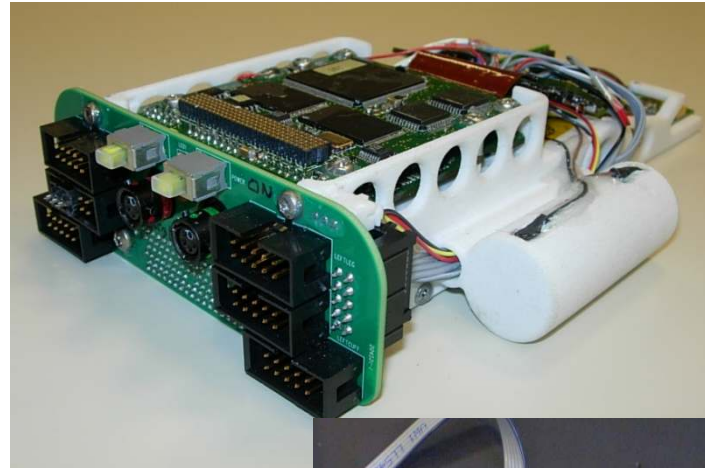


TECH-STAR

Data Collection over the Years



AST (2002)



ISS (2007)



AST 2 (2005)



SSS (2009)

Tech Air Race Control Unit





Sensing Aim:

SPOT THE CRASH





Textual Definition of a crash:

“A collision, or loss of control, which ultimately causes the motorcycle to topple.”





Mathematical Definition of a crash:

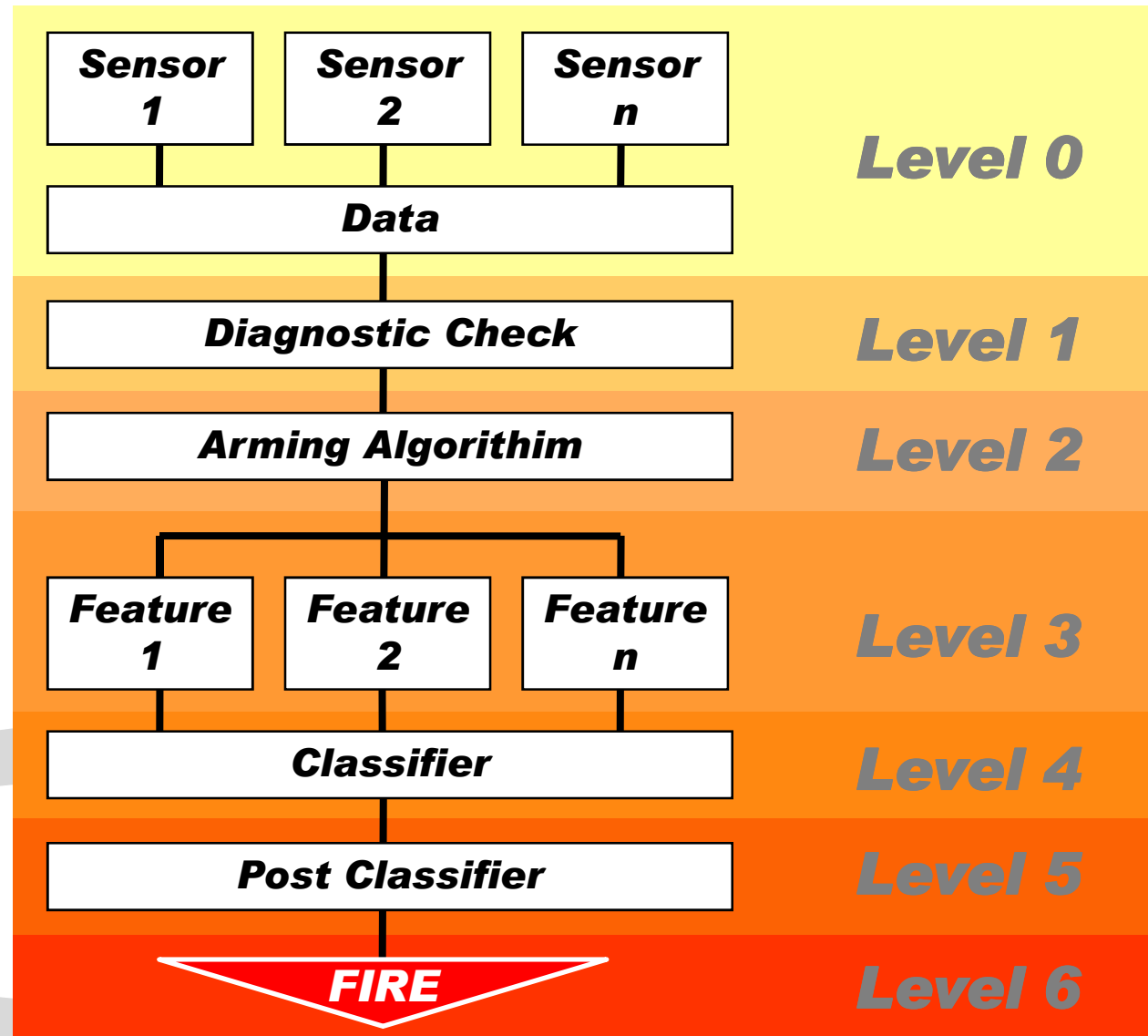
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Detection System

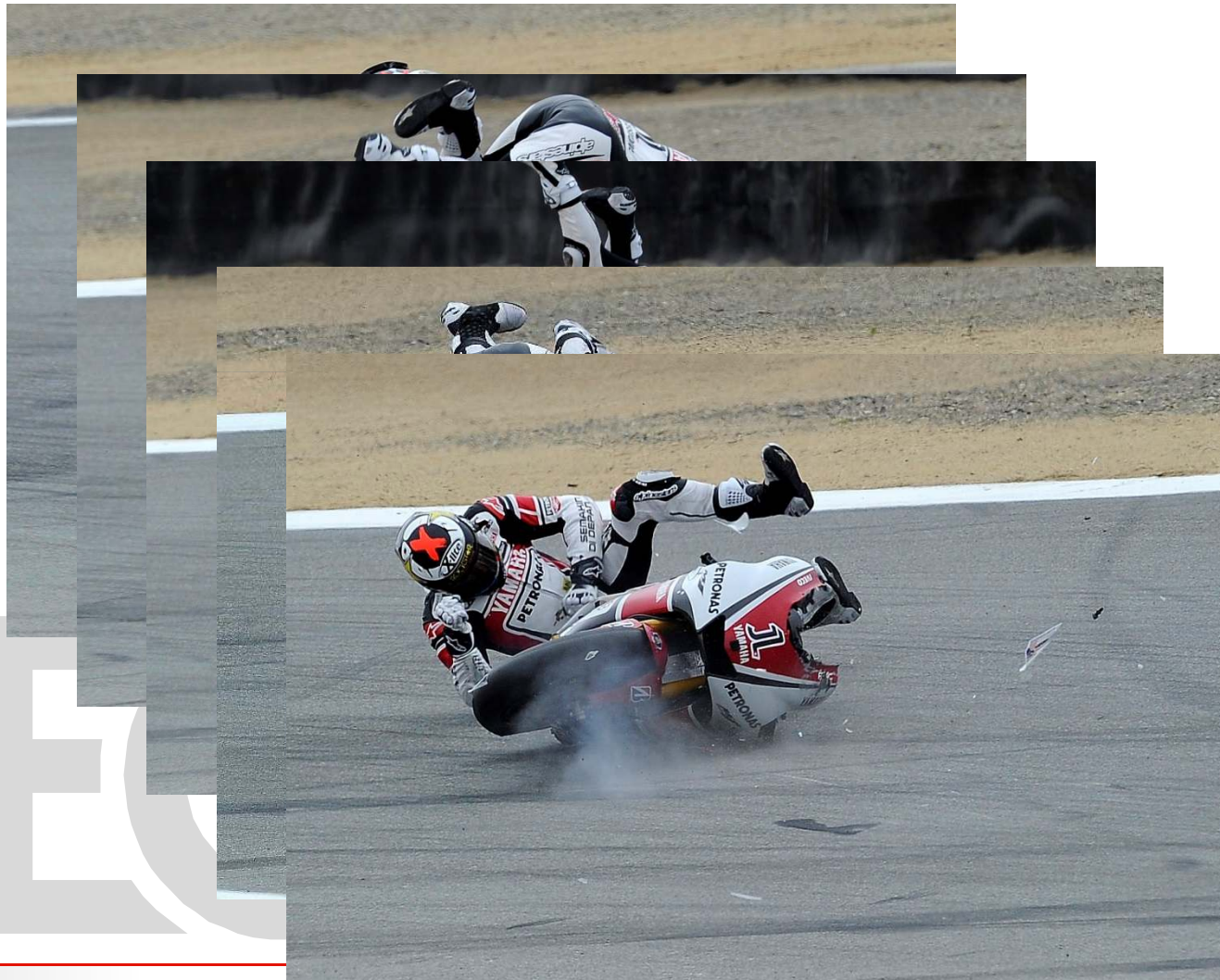


Arriving to
the Fire
Decision





- Jorge Lorenzo – Laguna Seca – High Side



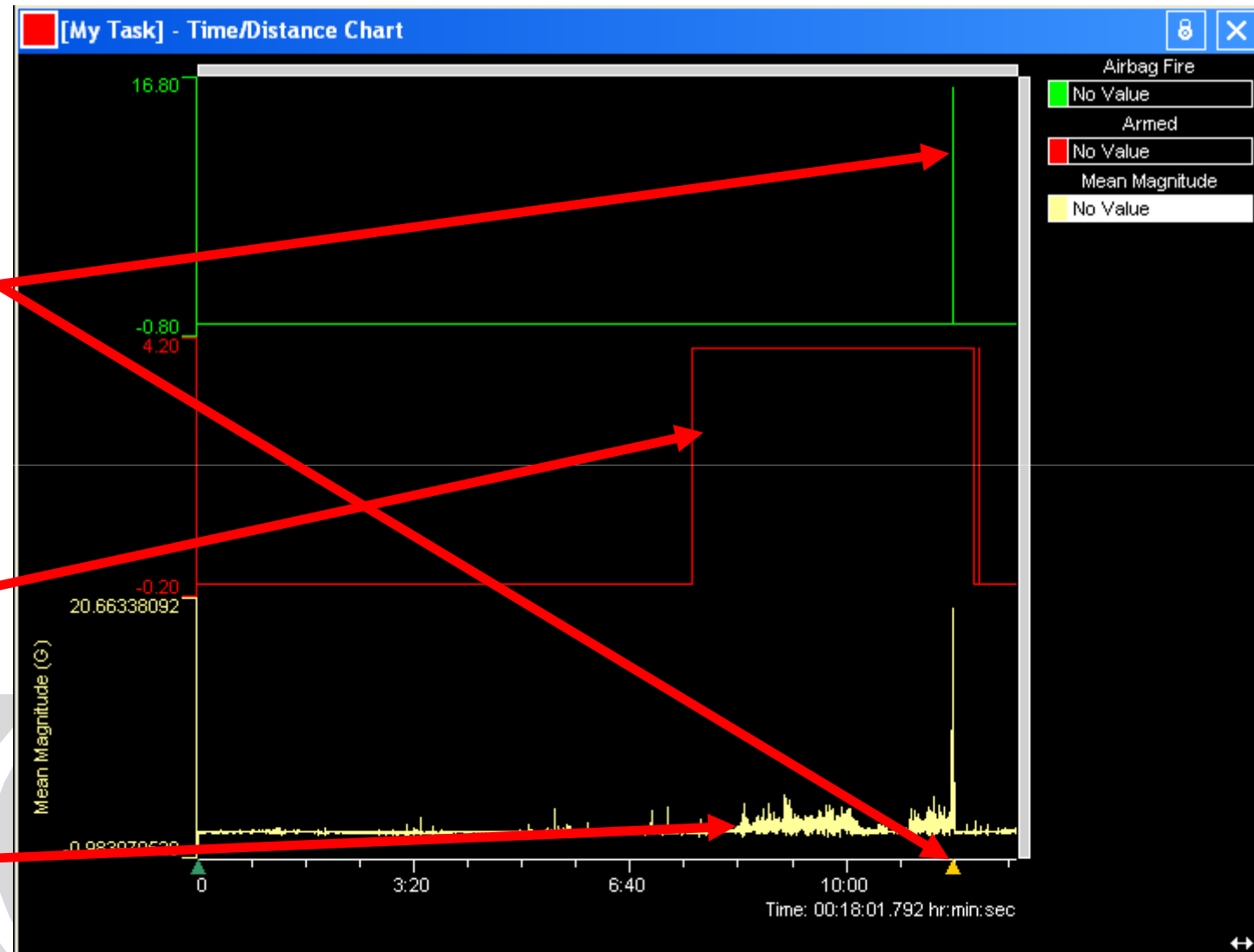
Real Life Data – System Overview



Deployment
Indicators

System
Armed

Riding
Activity





TECH-R RACE

TECH-R

In Event of a Crash



- Airbag Inflation: 45ms
- Protective Performance Guaranteed: 5s
- Deflation within 20s
- Ready for next inflation within 60s



TECH

Remote Diagnostics



- WiFi Card on Board
- Connects to Laptop or Smartphone (Smartphone Optimised)
- Provides Simple Graphical Overview of System Status
- Aids System Support from TAST



Expanded System – Season 2014



INFLATED STATE

TECH AIR BAG





Thank you