

# ALTEN Global Technologies



ALTEN Global Technologies Private Limited (ALTEN GT) is part of the ALTEN Group of companies with primary focus on Automotive, Aerospace, Embedded & Enterprise products and engineering services.

With strong background in Built-to-Spec Safety Critical Product Development, ALTEN GT has made significant contribution towards been working on the automotive vertical in the areas of GPS, Telematics, Motor Control Units, Communication Stacks, Bootloaders & Functional Safety Engineering Services on several customer programs

Over the years, ALTEN GT has chartered an impressive record of accomplishment In customer satisfaction, innovation, sales and profitability. This has been made possible with continuous enhancement of Competence in Technology, Quality Processes, Project Management and Customer Focus.



## Functional Safety Offerings

### We offer turn-key technology solutions, platforms and services to help build the Future of Mobility



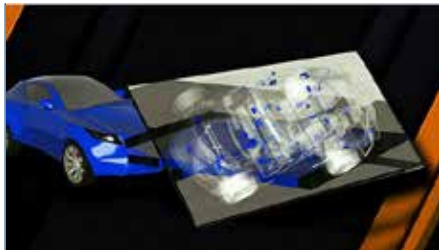
Body Control Module



Platform Software



Motor Control Platform



COM and Diagnostics Stack Library



Automotive Hardware Development



Digital Cockpit



Electric Vehicle Solutions



ISO 26262, Cybersecurity & ASPICE

### ALTEN GT is presently working on the ISO26262 FuSa compliance on the Domains

- Body control module
- Electric vehicle powertrain
- Battery management system



- ECU communication & diagnostics
- Telematics solutions
- Digital Cockpit solution

# Functional Safety (FuSa) standards

ALTEN GT has very good experience in developing safety critical products to automotive and aerospace standards.

## Automotive Standards:

- ISO 26262 (Parts 2, 3, 4, 5, 6, 8, 9, 10)

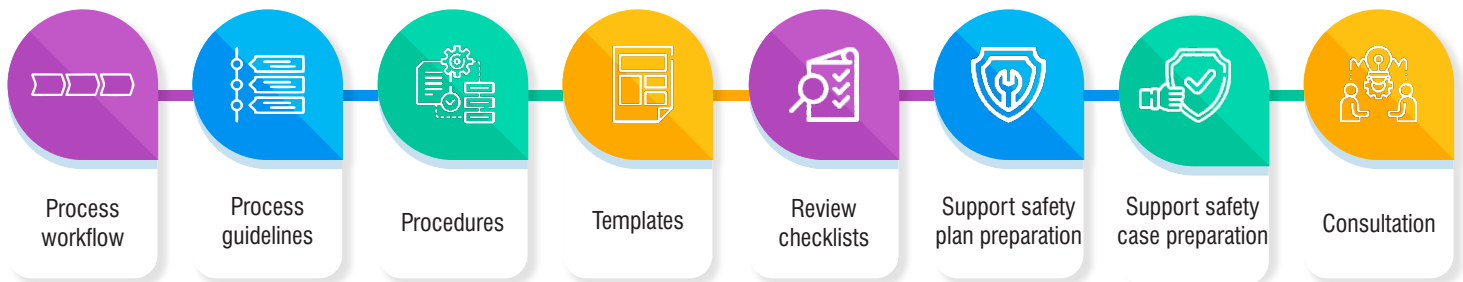
## Avionics Standards:

- ARP 4754/ARP 4761 (System)
- DO-254 (Hardware)
- DO-160 (Environment)
- DO-178B/DO178C (Software)



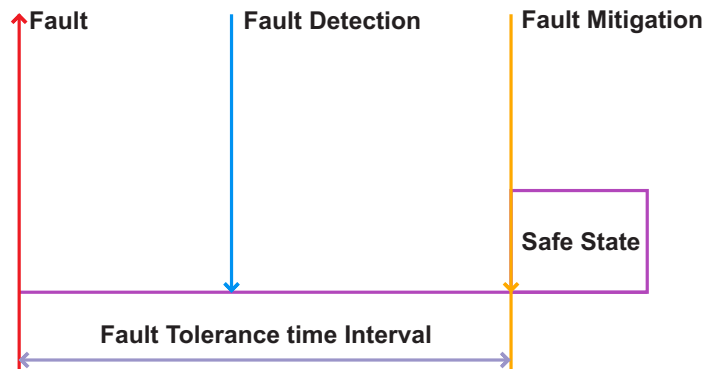
# Safety Process

ALTEN GT helps the customers onboard with ISO 26262 process by providing the following:



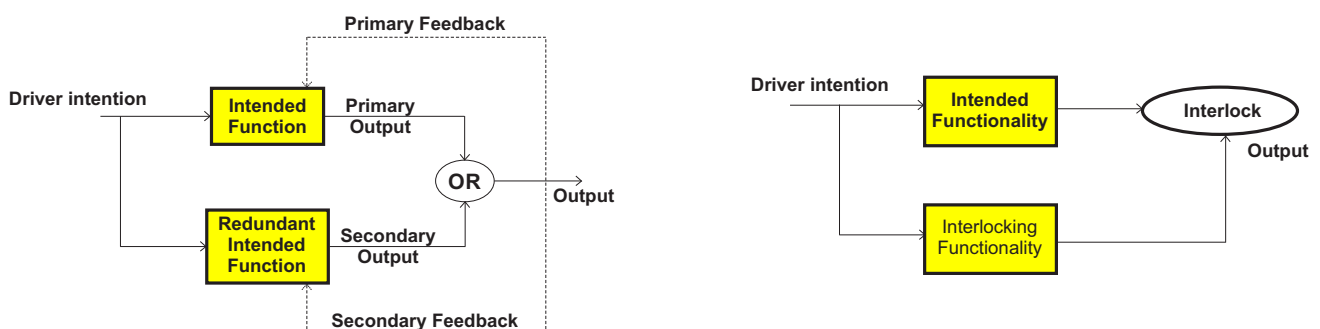
# HARA

- Hazard Analysis and Risk Assessment
- Derive safety goals
- Derive safety goal attributes
- Derive ASIL based on HARA
- FTTI calculation based on FTAs
- Derive Safe State
- Derive safety mechanism
- Derive safe maintenance intervals



# Functional Safety Concept Preparation

Design suitable functional safety concept for the safety goals



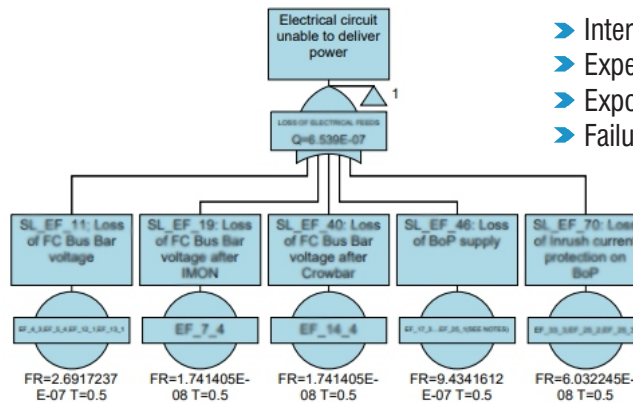
ALTEN GT provides services to do the following Failure mode effect analysis:

- System Failure Mode Effect Analysis
- Hardware Failure Mode Effect Analysis
- MTBF calculations
- SPFM and LFM calculations
- Experience with international standards MIL 217 and IEC 62380
- Evaluation of hardware architectural metrics
- Software Failure Mode Effect Analysis
- Software Dependent Failure Mode Effect Analysis

HW component/part ID	Part Number	Failure rate/FIT	Safety relevant?	Failure mode	Failure mode Distribution (FMD)	Will it violate safety goal in absence of a Safety Mechanism?	Safety mechanism(s) preventing the failure mode from violating the safety goal?	Failure mode coverage wrt. violation of safety goal (DC wrt SPF/RF)	Residual or Single-Point Fault failure rate/FIT	Will it violate safety goal with another independent failure of another component?	Detection means? Safety mechanism(s) preventing the failure mode from being latent?	Failure mode coverage with respect to latent failures (DC wrt latent MPF)	Latent Multiple-Point Fault failure rate/FIT	
J9	5595922 30	10	Yes	All	100%	yes	none	0% (Single point fault)	$= 10 \times \frac{100}{100} \times \frac{(100-0)}{100}$ = 10					
C2	08055C4 72J422A	3	yes	C2 open	10%	no				yes	SM2	90% (MPF, detected)	$= 3 \times \frac{10}{100} \times \frac{(100-90)}{100}$ = 0.03	
				C2 short	90%	no				no (Safe fault)				
L14	882422H 103K100	8	Yes	L14 short	90%	no	SM1			no (Safe fault)	SM1			
				L14 open	10%	yes		99% (Residual fault)	$= 8 \times \frac{10}{100} \times \frac{(100-99)}{100}$ = 0.008	no				
R96	CRCW08 05100RJ NEA	3	Yes	R96 open	80%	no				yes	none	0% (MPF, latent)	$= 3 \times \frac{80}{100} \times \frac{(100-0)}{100}$ = 0.24	
				R96 +ve drift of resistance	5%	no				no (Safe fault)				
				R96 -ve drift of resistance	5%	no								
				Σ Safety Relevant FIT = 24					Σ SPF/RF FIT = 104.008 = 10.008				Σ Latent FIT = 0.27	

## FTA

- Fault tree analysis
- Common cause analysis
- Cutset analysis
- GTPROB calculation



- Interference analysis
- Experience with the safety tools e.g., ISO Graph
- Exposure duration
- Failure model

## Safety Element out of the Context (SEooC)

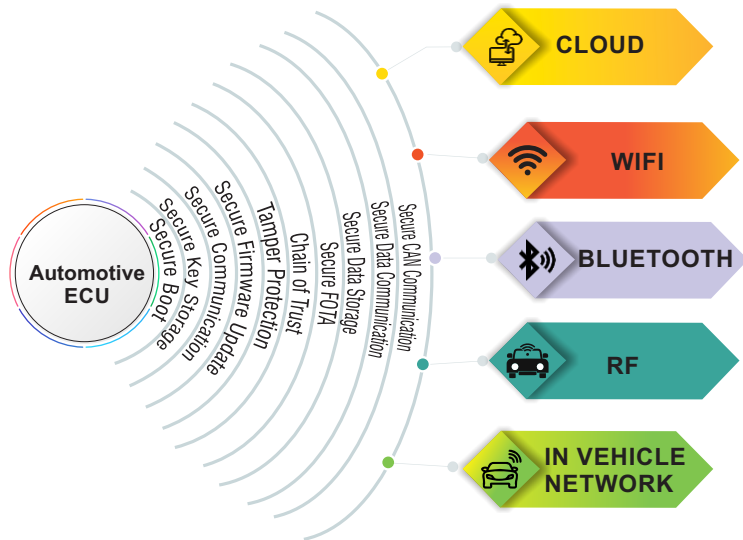
- 01 Safety plan preparation
- 02 Configuration plan preparation
- 03 Tool classification report preparation
- 04 Development activities
- 05 Independent Verification activities
- 06 Failure mode effect analysis
- 07 Safety case preparation
- 08 Confirmation reviews

# Confirmation Measures

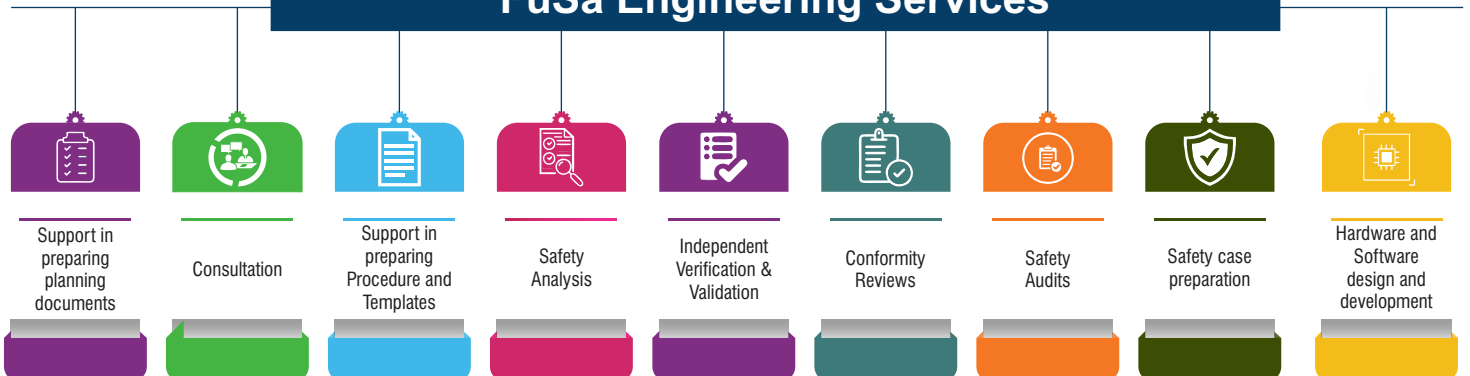


## ALTEN GT design and develop the systems with the following security features :

- Secure Boot
- Chain of Trust
- Secure Key Storage
- Secure FOTA
- Secure Data Storage
- Secure Data Communication
- Secure CAN Communication
- Secure Software Development



## FuSa Engineering Services



[www.altengt.com](http://www.altengt.com)

