

SAFESTART HUMAN FACTORS CONFERENCE



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EPIROC

Technology: Advancing Safety or Silently Enabling Complacency?





01

FAMILY

8 Children

6 Grandchildren

1 Poodle (PPE)

02

PROFESSIONAL

Manufacturing 1977
M.E., NC Programmer,
Quality, IT, Safety,
SafeStart® Global PM

03

INTERESTS

Technology
Music
Vinyl Collector
Theatre (Acting)
Baseball



Introduction & Overview

- *“Who am I? Why am I here?”*
- Complacency – Definition and Real Life Implications
- The Scope and Impact of Technology
- Real World Case Study Focus: Automotive
- Good Intentions Meet the Human Factor
- The End Result: Dependency & Programming
- The Solution: Reprogramming

Complacency



The Ultimate Human Factor

- Covert, not Overt – A Whisper, not a Sound
- Pop Quiz
- Driving from home to work – tell me the route
- The phone # of your best friend
- What is YOUR definition?

Complacency

✓ “Expert” Definitions

1. a feeling of smug or uncritical satisfaction with oneself or one's achievements **Google Search**
2. an instance of usually unaware or uninformed self-satisfaction **Merriman-Webster**
3. self-satisfaction especially when accompanied by unawareness of actual dangers or deficiencies **Merriman-Webster**

Complacency



Reality

- *a feeling of calm satisfaction with your own abilities or situation that prevents you from trying harder* Cambridge English
- The aura of “been there, done that”
- Thinking “I can do that in my sleep”
- Or just being over confident

Complacency

✓ “Expert” Definitions

Regardless of these definitions...

***Reality: When it comes to safety,
complacency can be dangerous.***

***Larry Wilson calls it
“The Silent Killer”***

Complacency

✓ Close Encounters of the Worst Kind

- “I am never complacent.”
- “Don’t you think I know what I’m doing?”
- “So experience is a bad thing?”
- “I am always on my toes.”
- “I’ve got this.”

Complacency

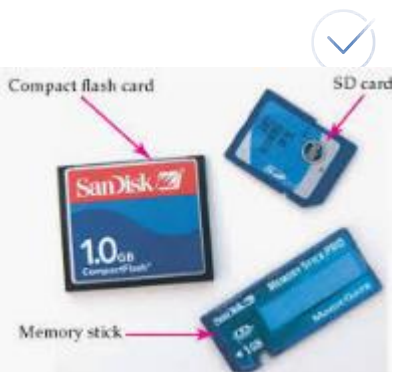


The Power of Complacency ... as told on YouTube

- Letting Go of Complacency “...staying stuck in situations”
[Anne Malhum - TEDxTalk](#)
- How To Avoid Complacency “...a cancer in an organization”
[Rick Houcek](#)
- Success leads to Complacency, Complacency leads to Failure
[Patrick Schwerdtfeger](#)
- The Subtle Giant of Complacency “...stops progress”
[Pastor Marcus Mecum](#)
- Complacency Ruins Relationships “...taking things for granted”
[Coach Corey Wayne](#)
- How Costly is Complacency “...high comfort level leads to losing”
[Coach Sean Payton](#)

Digitization Through Technology

Multimedia



1. Files: Date, Photos and videos digitized
2. Various portable media storage types
3. Transferring to common storage area
4. Failure of common storage area

➤ Backup strategies – On-site + Off-site + *The Cloud*

Reality: The value of a backup is best understood when you need it.



Efficiency Through Technology



Traversing Bay Doors

1. Automated door sensors don't remove Line of Fire
 2. Automated door opening doesn't alleviate Rushing
- Stay out of the Line of Fire!
 - Never assume automation will work as predicted.
 - Gates at toll booths, parking lots; doors at grocery store

Safety Through Technology



Navigation

1. Increasing dependency but improving technology
2. Knowing the way vs. being led
3. From “planning & knowledge” to total control
4. Walking by GPS Example
5. Is the GPS always right?

Automotive Safety Through Technology

In 2017, 37,133 people died
in motor vehicle crashes.
Research shows that the vast
number of vehicle crashes
are tied to human error.

Automotive Safety Through Technology



Source: <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812603>

Five Eras of Safety

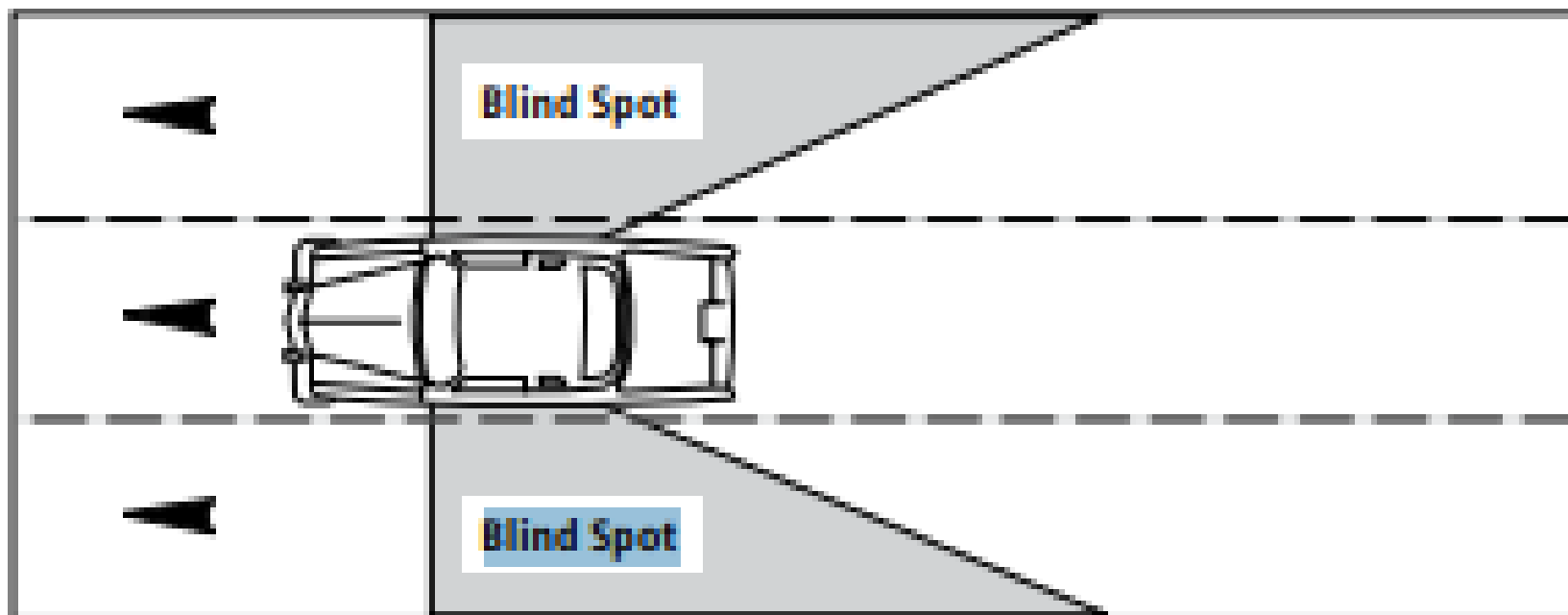
Automotive Safety Through Technology



<https://www.nhtsa.gov/technology-innovation/automated-vehicles>

Automotive Safety Systems

✓ Blind Spot Detection (BSD)



Automotive Safety Systems



Forward Collision Warning (FCW)

1. Front sensors and/or cameras sense objects
 2. Radar distance determines alert
 3. Visual indicator on dash + audible warning
 4. Inclement weather reduces effectiveness
- ✓ Blocked or Dirty Sensors
 - Keep your eyes on task! A warning may be too late!

Automotive Safety Systems



Lane Departure Warning (LDW)

1. Front cameras look for lane line indicators
 2. Visual indicator on dash + audible warning
 3. Effectiveness determined by road line marking quality
 4. Inclement weather reduces effectiveness (SNOW)
- ✓ Blocked or Dirty Camera Lenses
 - Keep your eyes on task! A warning may be too late!

Five Eras of Safety

2010 – 2016



Advanced Driver Assistance Features

- Rearview Video Systems
- Automatic Emergency Braking
- Pedestrian Automatic Emergency Braking
- Rear Automatic Emergency Braking
- Rear Cross Traffic Alert
- Lane Centering Assist



2016 - 2025

Partially Automated Safety Features

- Lane keeping assist
- Adaptive cruise control
- Traffic jam assist
- Self-park

<https://www.nhtsa.gov/technology-innovation/automated-vehicles>

Automotive Safety Systems



Automotive Safety Through Technology???

Forbes

1,377 views | Oct 17, 2018, 03:52pm

Drivers Rely Too Heavily On New Vehicle Safety Technologies, Increasing Risk



Tanya Mohn Contributor @
Travel



NewsRoom

Drivers Rely Too Heavily on New Vehicle Safety Technologies In Spite of Limitations

Misunderstanding and misuse of driver assistance technology could lead to a crash

FOR MORE INFORMATION:



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WASHINGTON, D.C. (Sept. 26, 2018) – More and more, drivers are recognizing the value in having vehicles with advanced driver assistance systems (ADAS) like blind spot monitoring systems, forward collision warning and lane keeping assist. However, while many of these technologies are rapidly being offered as standard, many drivers are unaware of the safety limitations of ADAS in their vehicles, according to new research from the AAA Foundation for Traffic Safety.

Are We Driving Dumber In Smarter Cars?

Among those with or without ACC or LKA, percentage who said they “frequently” or “sometimes” engage in this behavior while driving.

	Adaptive Cruise Control 		Lane Keeping Assist 	
	WITH	WITHOUT	WITH	WITHOUT
 Reading or sending text messages	62%	49%	62%	51%
 Interacting with cell phone apps	56%	42%	54%	44%
 Manually entering a phone number	52%	38%	56%	38%
 Holding phone while talking	60%	50%	63%	51%
 Using video chat on cell phone	39%	19%	42%	20%

Remember, advanced safety features don't eliminate the need for drivers to remain attentive at all times!

Smart cars tend to make drivers feel complacent and may lead to distracted driving, according to a new State Farm study. Credit: State Farm.



<https://newsroom.statefarm.com/distracted-driving-advanced-tech/>

Are We Driving Dumber In Smarter Cars?



Five Eras of Safety

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) AUTOMATION LEVELS

Full Automation



0

No Automation

Zero autonomy; the driver performs all driving tasks.



1

Driver Assistance

Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.



2

Partial Automation

Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.



3

Conditional Automation

Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.



4

High Automation

The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.



5

Full Automation

The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.



The New York Times *Self-Driving Uber Car Kills Pedestrian
in Arizona, Where Robots Roam*

New studies highlight driver confusion about automated systems

June 20, 2019



[s/detail/new-studies-highlight-
tomed-systems](#)

AARIAN MARSHALL TRANSPORTATION 04.09.19 08:44 PM

FORD TAPS THE BRAKES ON THE ARRIVAL OF SELF-DRIVING CARS



NEWS GIZMODO

71 Percent of Americans Still Don't Trust
Autonomous Cars According to New Survey 2019

Good Intentions Meet The Human Factor



Technology's Impact on Complacency

- *a feeling of calm satisfaction with your own abilities or situation that prevents you from trying harder* Cambridge English
- *a feeling of calm satisfaction with your own abilities or situation that prevents you from **thinking** harder*
- *a feeling of calm satisfaction with **technology's** abilities in a situation that prevents you from **thinking** harder (or at all)*

The End Result

✓ Dependency & Programming

- *Technology begets Technology through advancement*
- *Technology is often a response to some difficulty, some error, some opportunity to improve – sometimes to eradicate complacency - the **Complacency Loop***
- *Yet, Technology can create its' own **Complacency Trap***
- *The Trap is Dependency, and in time: **Over Dependency***

SafeStart® Correlation



These four states...

- ☐ Rushing
- ☐ Frustration
- ☐ Fatigue
- ☒ **Complacency**

can cause or contribute to these critical errors...

- ☐ Eyes not on Task
- ☐ Mind not on Task
- ☐ Line-of-Fire
- ☐ Balance/Traction/Grip

...which increase the risk of injury.

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Safety-Related Habits

- ☐ Test your footing or grip before you commit your weight (getting out of car, etc.)
- ☐ Look carefully at anything you are going to stick your hand into or rest your hand on
- ☐ Move your eyes first before you move your hands, feet, body or car
- ☐ Get your eyes back on the road quickly if you've been distracted
- ☐ Look for line-of-fire potential before moving (blind corners, aiseways, etc.)
- ☐ Look for things that could cause you to lose your balance, traction or grip
- ☐ Glance up before standing up or raising your hands (bang head or hands, etc.)
- ☐ Keep your hands out of pinch points
- ☐ Use three-point contact when ascending or descending (ladders, mobile equipment, etc.)
- ☐ Hold the handrail on stairways
- ☒ Other: _____

Evaluate Technology Dependency

Assessing Technology Impact on Risk

Process/Product/Project Name:

Classify

P = Probability

I = Impact

RV = Risk Value (RV= P x I)

RV

Extreme Risk (Action Plan Required)

Moderate Risk (Action Plan Discretionary)

Low Risk (Action Plan not required)

Risk #	Risk Description	Date	P	I	RV	Action Plan
1	Environmental Considerations				0	
2	Job Hazard Impact (Safety Manager)				0	
3	<i>Technology Dependency</i>				0	
4	<i>Technology Failure</i>				0	

Probability	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
Impact					

The Final Chapter



The Solution: Reprogramming Behavior

- *Best way to avert drivers temptation to handle phone?*
 - *Shut off or keep It out of reach*
 - *Set notification “Can’t Talk Now”*
- *Tools to consider if/when use is required?*
 - *Intelligent Infotainment (Apple CarPlay, Android Auto)*
 - *Voice commands, Familiar Systems (Siri, Google Assistant)*

The Final Chapter

✓ **The Solution: Reprogramming Behavior**

Avoid the Complacency Trap...

***In The End: Treat technology
only as an aide***

***Never let Technology
Replace Common Sense***

**You will always
be your best
safety advocate.**

**Never forget
about THAT
Human Factor!**

**Doverey, no proverey
- Trust but verify.**

Ronald Reagan


www.idlehearts.com

THANKS FOR
Your Participation!