

# **ADRENALINE MAKES YOU STUPID**

**WHY SITUATIONAL AWARENESS IS SO  
FREAKIN IMPORTANT  
CEU TRAINING 2024**

First and always present – the world is getting dangerous, we must protect ourselves

## **IS THE SCENE SAFE? *REALLY?***

- **What is “Situational Awareness”?**
- **How do we know the “Scene IS Safe”??**
- **What do we do when the scene becomes “NOT Safe”???**
- **How can we protect The Most Important Person on That Scene (YOURSELF)????**



We know the usual drill: BSI/scene safe. What if it isn't? We know the stuff we need to look out for: MVA dangers, hazardous materials, crime scenes, unstable structures and environments.

Now, with the added dangers of COVID19, we have to be very, very aware of what is going on around us on-scene.

In today's environment complacency can kill us!

## **IS THE SCENE SAFE? *REALLY?***

- **What can we do to make ourselves better able to recognize an unsafe scene?**
- **How can we have better situational awareness?**
- **Can we learn from the mistakes of other industries?**
- **Can we learn from the mistakes of our own industry?**

While there has been significant discussion on the topic of response to violent incidents, it should be noted that among fire service constituency organizations, there is currently no clear and universally accepted definition of what constitutes a violent incident. In some situations, the acts of violence were premeditated, while in other cases the violence erupted without any warning. In a number of instances, responders were injured due to a lack of understanding of how certain situations can degrade quickly, such as following sporting events or sensitive community events where emotional expressions of passion turned violent. Local agencies often found themselves ill-prepared, understaffed and/or overwhelmed when events unfolded

# OBJECTIVES

- **Part One: What Were They Thinking?** – the causes of *really bad* mistakes
- **Part Two: Adrenaline and why it Makes Us Stupid**
- **Part Three: Situational Awareness** – how can we improve?



Little or no data exists that can define the scope of this issue. However, based upon anecdotal accounts related during the focus group discussion, it appears that the problem is widespread. Participants were able to recount multiple instances of attacks and assaults on firefighters. This also appears to be supported by the media; online reports indicating that emergency personnel were victims of violence are almost daily instances in the United States

In the early morning of December 24, 2012, firefighters responding to a fire in [West Webster, New York](#), a suburb of [Rochester](#), were fired upon by 62-year-old William H. Spengler, who was believed to have deliberately set the fire.

Two of the firefighters were killed.

According to police, Spengler set his house on 191 [Lake Road](#) and the family car on fire in the early morning hours of [Christmas Eve](#), and then armed himself with three guns: a [Smith & Wesson .38-caliber revolver](#), a [Mossberg 12-gauge shotgun](#), and a [.223-caliber Bushmaster semi-automatic rifle](#). When firefighters arrived shortly after 5:30 a.m., Spengler ambushed them from an earthen berm across the street from his house. Two firefighters were killed, and two others were injured. Spengler exchanged shots with police, who arrived with an armored truck to remove

the firefighters and 33 nearby civilians. Spengler ran after getting shot at and died when he shot himself in the head. His body was discovered nearly six hours later. Due to the shooting, fire crews were unable to resume fighting the blaze until 11:30 a.m. By then, six other houses had burned to the ground, and two others had been rendered uninhabitable.



PART ONE

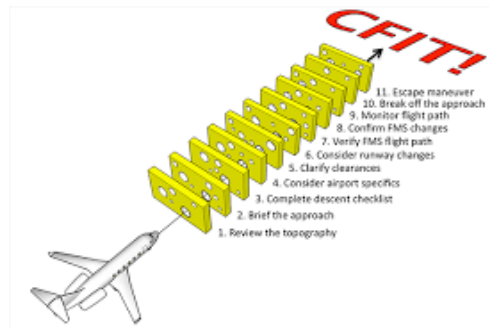
***"WHAT WERE THEY THINKING?":***  
**WHY WE MAKE REALLY STUPID**  
**MISTAKES,**  
**AND WAYS TO MINIMIZE THEM**

**HOW WE CAN LEARN FROM AIRPLANE PILOTS  
AND SLICES OF SWISS CHEESE...**

We're going to take a look at aircraft pilots right now – at something called CFIT. A REALLY SAD term that means "Controlled Flight Into Terrain" - this is, like, the worst case in lost situational awareness.

# LEARNING FROM PILOTS

- **Why choose airplane emergencies?**
- **You can't just "pull over" and think things out**
- **When the emergency happens – you have to DO SOMETHING NOW !**
  
- **Situational Awareness is literally life-or-death...**
- **CFIT means Controlled Flight Into Terrain.**



SA cannot be lost in the air – and I'm starting with this as an extreme example of how important SA is to us.

Have you heard of the Swiss Cheese Model? The **Swiss cheese model** of accident causation is a model used in [risk analysis](#) and [risk management](#), including [aviation safety](#), [engineering](#), [healthcare](#), and emergency service organizations (like us).

It likens human systems to multiple slices of [swiss cheese](#), stacked side by side, in which the risk of a threat becoming a reality is mitigated by the differing layers and types of defenses which are "layered" behind each other. Therefore, in theory, lapses and weaknesses in one defense do not allow a risk to materialize, since other defenses also exist, to prevent a [single point of failure](#). The holes in the slices represent weaknesses in individual parts of the system and are continually varying in size and position across the slices. The system produces failures when a hole in each slice momentarily aligns, permitting "a trajectory of accident opportunity", so that a hazard passes through holes in all of the slices, leading to a failure.

Look at this image – it graphically shows what could happen when all those holes line-up in the Swiss Cheese to produce CFIT.

# Learning from Pilots – the CFIT

The second most common primary causal factor of aircraft accidents was “lack of positional awareness in the air,” generally resulting in *controlled flight into terrain (CFIT)*.



**CONTROLLED FLIGHT INTO TERRAIN – now doesn't THAT sound nasty??????**

Gaining and maintaining situation Awareness (SA) is a major asset in flying, but if awareness is absent or degraded then hazardous threats or errors may not be detected

Of the accidents attributable to human factors failures (80% of the total), 75% of those accidents were caused by failures in situational assessment / subsequent decision actions.

- 75% of the accidents in the 1994 NTSB study could be classified as "Plan Continuation Errors" - essentially errors in assessment / judgment.

The most frequently identified causal factors in the 589 fatal accidents were:

- 1) Lack of positional awareness in air 244 (41.4%)**
- 2) Omission of action / inappropriate action 216 (36.7%)
- 3) Flight handling 177 (30.1%)
- 4) Poor professional judgement / airmanship 134 (22.8%)
- 5) Slow and/or low on approach 113 (19.2%)
- 6) Failure in Crew Resource Management (CRM) 101 (17.1%)
- 7) Press-on-it-is 97 (16.5%)
- 8) Deliberate non-adherence to procedures 72 (12.2%)



*Note: The factors are not mutually exclusive as each accident generally involves more than one factor.*

It is interesting to note that the 8 most frequently identified causal factors (including primary) belonged to the *Crew* group.

**UK CAA CAP 681 Global Fatal Accident Review 1980-1996**

## CFIT:

[HTTPS://WWW.YOUTUBE.COM/WATCH?  
V=BXR3XR4RJ98](https://www.youtube.com/watch?v=BXR3XR4RJ98)

Copy and paste the  
link above to watch  
video.



This seven minute video points out some very important facts about SA:

There are two sets of rules for flying any aircraft: VFR and IFR. **VFR stands for *Visual Flight Rules*** and IFR means *Instrument Flight Rules*. Depending on the weather conditions a pilot may opt for one set of rules or the other. There are a number of other factors that influence the decision but for simplicity's sake it's the weather that make you fly VFR or IFR.

You can't get help if your don't ask for it!

Always be on-guard for changes to the "normal" way of operating!

A Safety Culture is not a "checklist" item – it is a way of operating that pays attention to the details!

Once you start down the slippery slope of ignoring the details you may be headed for disaster! The holes in the Swiss Cheese line-up

**CAUSES OF MISTAKES,  
ERRORS, INCIDENTS...**

- ✘ HUMAN ERROR**
- ✘ LACK OF FOCUS ON  
THE TASK AT HAND**
- ✘ INATTENTION TO  
DETAIL**

**...SOUND FAMILIAR?**



In the fire service - We've talked about these (or been talked-to about them) for years.

We STILL make mistakes. WHY???

**WHAT CAUSES PEOPLE WHO ARE FULLY  
COMPETENT, MOTIVATED, AND WELL-INTENTIONED  
TO MAKE THE SIMPLEST OF MISTAKES?**

**\*\*\*\* “WHAT WERE THEY THINKING?!?!” \*\*\*\***

**WELL OBVIOUSLY, THEY WEREN'T....OR WERE THEY?**



Usually these kinds of mistakes are laid at the feet of “pilot error” but that doesn’t help us determine what we can do to reduce this.

## ***THREE AREAS OF CONCERN:***

**1. FOCUS AND ATTENTION**

**2. MULTI-TASKING**

**3. CONTEXT.**



These are three areas that we need to look-at:

Number 1, focus and attention – does this one really make up most of the “human error”?

Number 2, multi-tasking – we are aware that this is why we cannot “text-and-drive”, but just how important is it?

Number 3, context – can your mind be influenced enough to “let down your guard”?

# ATTENTION

## **#1: FOCUS AND SELECTIVE ATTENTION**

**OUR ABILITY TO FOCUS IS KEY TO PERFORMING WORK ACCURATELY, SAFELY, AND EFFICIENTLY**

**TUNING OUT UNNECESSARY OR NON-CRITICAL INFORMATION AROUND US GIVES US THE ABILITY TO FOCUS, AND DOING SO OVER TIME GIVES US THE ABILITY TO CONCENTRATE AND PERFORM TASKS CORRECTLY**

**WE MUST PRIORITIZE WHAT IS IMPORTANT TO PAY ATTENTION-TO.**



A good example of this is using the acronym ABCDE in our patient assessments – we choose what to tune-out, yes we have SELECTIVE attention

**WATCH THIS VIDEO AND ANSWER THE QUESTION:**

**[HTTPS://WWW.YOUTUBE.COM/WATCH?V=IGQMDOK\\_ZFY](https://www.youtube.com/watch?v=IGQMDOK_ZFY)**

Copy and paste the link above to watch video.



The gorilla test: watch the video and answer the questions

This experiment reveals two things: that we are missing a lot of what goes on around us, and that we have no idea that we are missing so much. To our surprise, it has become one of the best-known experiments in psychology. It is described in most introductory textbooks and is featured in more than a dozen science museums. It has been used by everyone from preachers and teachers to corporate trainers and terrorist hunters, not to mention characters on the TV show *C.S.I.*, to help explain what we see and what we don't see.

In certain situations this can be fatal -

## QUALITY #1: FOCUS AND SELECTIVE ATTENTION



- ***EASTERN AIRLINES, FLORIDA, 1972***
  - ***LANDING GEAR INDICATION LIGHT***
  - ***101 FATALITIES OF 176 ONBOARD***
- ***UNITED AIRLINES, OREGON, 1978***
  - ***LANDING GEAR ISSUE***
  - ***ENGINE FLAMEOUT ON LOW FUEL***
  - ***10 FATALITIES OF 189 ONBOARD***

**Eastern Air Lines Flight 401** was a scheduled flight from New York ([JFK](#)) to [Miami](#). On December 29, 1972, the [Lockheed L-1011-1 Tristar](#) serving the flight crashed into the [Florida Everglades](#), causing 101 fatalities. The pilots and the flight engineer, two of 10 flight attendants, and 96 of 163 passengers died; 75 passengers and crew survived. **The crash occurred while the entire cockpit crew was preoccupied with a burnt-out landing gear indicator light.** They failed to notice that the autopilot had inadvertently been disconnected and, as a result, the aircraft gradually lost altitude and crashed. It was the first crash of a [widebody aircraft](#) and, at the time, the second-deadliest single-aircraft disaster in the [US](#)

**United Airlines Oregon, 1978:** As the landing gear was being lowered on approach to Portland International Airport, the crew felt an abnormal vibration and yaw of the aircraft as well as a lack of an indicator light showing the gear was lowered successfully. The crew requested a holding pattern to diagnose the problem, and for approximately the next hour the crew worked to identify the status of the landing gear and prepare for a potential emergency landing. **During this time, none of the three cockpit flight crew effectively monitored the fuel levels, which was exacerbated by the fact that the gear was down with the flaps at 15 degrees during the entire hour-long holding maneuver, significantly increasing fuel burn rate.** As



the crew prepared for a final approach for an emergency landing into Portland, they lost the number one and number two engines to [flameout](#), at which point a [Mayday](#) was declared. This was the last radio transmission from Flight 173 to [Air Traffic Control](#). The plane crashed into a wooded section of a populated area of suburban Portland about 6 nautical miles southeast of the airport

# **QUALITY #1: FOCUS AND SELECTIVE ATTENTION**

## **FILTERING**



- *NECESSARY TO ALLOW BRAIN TO PROCESS THE MOST IMPORTANT INFORMATION*
- *MOST PEOPLE DO IT ALL THE TIME, BOTH INTENTIONALLY AND UNINTENTIONALLY*
- *RESEARCH INDICATES SOME MENTAL ILLNESSES ARE ROOTED IN THE BRAIN'S INABILITY TO FILTER NON-ESSENTIAL INPUTS, THUS OVERLOADING THE VICTIM'S CAPABILITY TO PROCESS THE MOST IMPORTANT INFORMATION.*

So, filtering is necessary in OTHER situations – what is the difference between zoning-out and CFIT?

# **QUALITY #1: FOCUS AND SELECTIVE ATTENTION**

## ***FILTERING***



- ***SELECTIVE ATTENTION OCCURS DURING THE PERFORMANCE OF ROUTINE TASKS IN FAMILIAR SURROUNDINGS***
- ***THIS AUTOMATIC PROCESSING NEEDS TO BE PERIODICALLY STOPPED TO ALLOW THE CONSCIOUS COMPONENT OF THE BRAIN TO CHECK ON PROGRESS, CHANGES, DANGERS, ETC.***

**This root of complacency can get us into trouble.** If we think we have no need to be aware of our surroundings then we “zone-out”  
So, the process needs to be stopped occasionally to check with our conscious brain.  
How do we do that? More on this later...

## **QUALITY #1: FOCUS AND ATTENTION**



**HOW IS THIS A GOOD  
QUALITY? A BAD QUALITY?**



**WHAT MIGHT YOU DO TO  
TAKE ADVANTAGE OF THIS  
QUALITY?**



**WHAT MIGHT YOU DO TO  
AVOID THE DOWNSIDE OF  
THIS QUALITY?**

Overhead questions for you to think about –

- 1 – How are filtering and focus “good” qualities? How are they “bad” qualities? Well, there is a lot going on in an emergency, but just how much are we filtering out?
- 2 – What might you do to take advantage of these qualities? Perhaps increase our awareness of the surroundings? More on this later.
- 3 – What might you do to avoid the downsides of these qualities? So, what do you all think? Training? What else?

## **#2: MULTI-TASKING**

**WE MAY THINK WE HAVE AN ABILITY TO FOCUS ON SEVERAL TASKS “SIMULTANEOUSLY”, BUT WHAT REALLY HAPPENS IS THAT OUR BRAIN IS FOCUSING ON ONE TASK AT A TIME, AND QUICKLY SWITCHING BETWEEN TASKS**

**THE ISSUE ON MULTI-TASKING IS HOW EFFECTIVELY OUR BRAIN CAN *LEAVE ONE TASK AND FULLY FOCUS ON THE NEXT TASK* .**



Think about this for a bit – just how efficient do you think you are when you are doing multi-tasking? Just like a computer – we switch between tasks. But a computer can do this MUCH faster than our own brains!

## **QUALITY #2: MULTI-TASKING**

**TO FULLY DISCONNECT AND RECONNECT TAKES TIME, MORE TIME THAN WE OFTEN APPRECIATE OR PROVIDE;**

**THIS RESULTS IN THE CONCURRENT TASKS BEING PERFORMED POORLY OR INCORRECTLY AT SOME POINT.**



That last point is the most important one here – AT SOME POINT the tasks will be performed poorly or incorrectly. Ouch.

If we cannot get away from having to do a lot at one time, what can we do to make this process better?

## **QUALITY #2: MULTI-TASKING**

### **CHECKLISTS FOR CRITICAL TASKS?**



- *ICU DOCTORS INSERT 4 MILLION CENTRAL IV LINES EACH YEAR; 4% BECOME INFECTED WITH 5-25% OF THOSE PATIENTS DYING AND THOSE WHO SURVIVE SPEND ~ 10 ADDITIONAL DAYS IN HOSPITAL*
- *DR. PETER PRONOST IDENTIFIED A 5-STEP CHECKLIST TO COMBAT CENTRAL LINE INFECTIONS*
- *MICHIGAN HOSPITALS IMPLEMENTED THE CHECKLIST:*
  - *INFECTIONS FELL 66% IN 3 MONTHS*
  - *SAVED ~ 1,500 LIVES AND \$175 MILLION.*

One example: Just a simple checklist – but because Doctors (and all the rest of us) do so much at the same time, we have a tendency to...er.... skip things. I'm not saying we should have checklists – just that we routinely multitask without a second thought. Just how much are we missing?

# MULTITASKING FIREFIGHTER

- How can we complete several important tasks—safely, effectively and in a timely manner—while working in the challenging environment?
- Many EMS are faced with task saturation and begin to “channelize” or “fixate” on one task, possibly jeopardizing the actions of the crew the overall operation.
- To combat task saturation, personnel must incorporate a structured method to prioritize tasks.



To even try to deal with several things at once on an emergency scene we have to be able to prioritize – deal with the most important things first.

This is why we do “ABCDE” assessment FIRST (instead of say, doing a blood pressure) for our patients: to find and fix the immediate life threats.



## **QUALITY #2: MULTITASKING**



**HOW IS THIS A GOOD  
QUALITY? A BAD QUALITY?**



**WHAT MIGHT YOU DO TO  
TAKE ADVANTAGE OF THIS  
QUALITY?**



**WHAT MIGHT YOU DO TO  
AVOID THE DOWNSIDE OF  
THIS QUALITY?**

Overhead questions for you to consider –

- 1 – How is this a good quality? How is it a bad quality? Well, there is a lot going on in an emergency, but just how much are we doing badly because of multitasking?
- 2 – What might you do to take advantage of this quality? Can we try to be aware of how much we do multitasking?.
- 3 – What Might you do to avoid the downside of this quality? So, what do you all think? Training again? What else?

## **#3: CONTEXT**

**MANIPULATING THE WAY INFORMATION IS PRESENTED CAN INFLUENCE AND ALTER DECISION MAKING AND JUDGEMENT ABOUT THAT INFORMATION;**

**IMAGES, WORDS, AND THE GENERAL CONTEXT AROUND THE INFORMATION PRESENTED, CAN INFLUENCE HOW PEOPLE THINK ABOUT THAT INFORMATION.**



Don't think you can be influenced by context?

As quickly as you can - scroll through the following pages and say your answer out loud!

**READY – SET – GO!**

**SHOUT OUT THE ANSWER TO THE  
FOLLOWING QUESTIONS:**

***YOU LAUGH WHEN SOMEBODY TELLS A***



**JOKE!**

***WHERE THERE IS FIRE, THERE IS.....***



**SMOKE!**

*I DON'T LIKE PEPSI, BUT I DO LIKE.....*



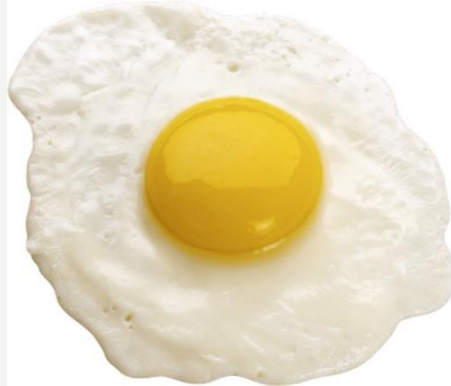
**COKE!**

***IF I HAVE NO MONEY, I'M FLAT-OUT.....***



**BROKE!**

***THE OUTSIDE OF AN EGG IS THE.....***



**How many said (or thought) Yolk?**

**BUT WAIT ....!**

**THE OUTSIDE OF AN EGG IS THE.....**



I also added a time pressure to this exercise – I did not allow you much time to think about your answer.

The context here was words that rhyme – joke, smoke, coke, broke – so you naturally wanted to say “yolk”, instead of thinking through your answer.



## **QUALITY #3: CONTEXT**

- **THE CONTEXT IN WHICH INFORMATION IS DELIVERED SHAPES ASSUMPTIONS AND PERCEPTIONS ABOUT THAT INFORMATION**
- **PEOPLE REACH CONCLUSIONS BASED ON THE FRAMEWORK WITHIN WHICH A SITUATION IS PRESENTED**

**STRESS AND THE PRESSURE OF TIME CAN AMPLIFY THIS QUALITY.**



**Context Matters**

**Which slice of pizza would you like to eat?**

We usually look for patterns - like in the last picture/word association, we went with the pattern of rhyming with "joke" . These patterns can affect how we see the environment around us.

WHAT DO YOU SEE?



***THIS IS PATTERN  
MATCHING:***



### **QUALITY #3: CONTEXT**

- **RECOGNIZING PATTERNS  
ALLOWS US TO PREDICT  
AND EXPECT WHAT IS  
COMING, KEY FOR  
SURVIVAL!**
- ***HOWEVER, RELYING ON  
PATTERNS DOES NOT  
GUARANTEE THE  
FUTURE.***

In fact looking for patterns can mess us up – What do you see? Do you see a goblet or do you see two faces? How about the drawing? Do you see an old man or a young girl?

A medical aid is just a medical aid, and we perform according to the **patterns** we perceive to allow us to do the job. WHAT IF SOMETHING CHANGES THE PATTERN?

## BOTH GOOD AND BAD

- Selective attention, multi-tasking and context can be both good and bad
- **BUT...**these can be dynamically emphasized under the influence of stress
- *What kind of stress do we routinely have????*



Like every time the pager goes off.... Adrenaline is a hormone released from the adrenal glands and its major action, together with noradrenaline, is to prepare the body for 'fight or flight'. But over time this kind of stress can harm.

## **QUALITY #3: CONTEXT**



**HOW IS THIS A GOOD  
QUALITY? A BAD QUALITY?**



**WHAT MIGHT YOU DO TO  
TAKE ADVANTAGE OF THIS  
QUALITY?**



**WHAT MIGHT YOU DO TO  
AVOID THE DOWNSIDE OF  
THIS QUALITY?**

Overhead questions for you –

1 – How is this a good quality? How is it a bad quality? Here again, there is a lot going on in an emergency, but just how much are we missing because of the context and time pressure?

2 – What might you do to take advantage of this quality? In order to take advantage of this we must be aware that it exists and that it can mess us up.

3 – What Might you do to avoid the downside of this quality? So, what do you all think?

And just how does adrenaline affect our thinking?



PART TWO

# ADRENALINE MAKES YOU STUPID!

YEAH, BUT WHAT A RUSH

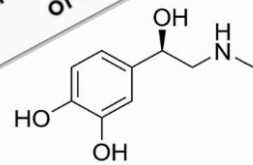
The overall effect of adrenaline is to prepare the body for the ‘fight or flight’ response in times of stress, i.e. for vigorous and/or sudden action. Key actions of adrenaline include increasing the heart rate, increasing blood pressure, expanding the air passages of the lungs, enlarging the pupil in the eye, redistributing blood to the muscles and altering the body’s [metabolism](#), so as to maximize blood [glucose](#) levels (primarily for the brain).

There is a continuous low level of activity of the sympathetic nervous system resulting in release of noradrenaline into the circulation, but adrenaline release is only increased at times of [acute](#) stress. We can get in trouble when it is released on a regular basis.

## ONE WORD: ADRENALINE

- 90% of the population lack the traits needed to perform well as an emergency responder
- Emergency responders are often called “Adrenaline Junkies”
- Average citizens are not able or prepared to deal with the stress we have on a daily basis.

Adrenalin is my drug  
of choice.



**ADRENALIN ADDICT**

You think that being an “adrenaline junkie” you can handle it? Better than those “average citizens”?

Yeah????

Just what does that rush do to your body?

## The Stress Response

The brain and body is alarmed and alerted in response to a threatening situation, this stress produces the adrenaline “fight/flight/freeze” response

It is integral to the life of every living organism,

Our natural defense against danger.



The stress response is an evolutionary, life-saving adaptation that exists among all living creatures. When we are confronted with a life-threatening event, this fight, flight, or freeze reaction is what gives us the ability to take instantaneous action, even before our thinking brain catches up. Our nervous system responds by releasing a flood of stress hormones, including adrenaline and cortisol. These hormones rouse the body for emergency action. Our heart pounds faster, muscles tighten, blood pressure rises, breath quickens, and senses become sharper.

## WHAT IS STRESS?

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=GILWruk81Tk](https://www.youtube.com/watch?v=GILWruk81Tk)

Copy and paste the link above to watch video.



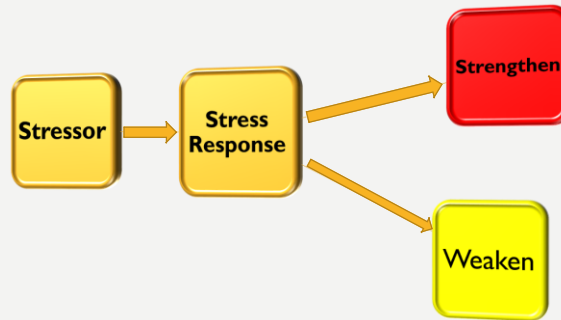
Everyone knows what stress is. We have all experienced the feeling of being stressed for one reason or another, sometimes several times a day. We also know what stress feels like: our muscles get tense, we become irritable and short tempered, our breathing becomes rapid and shallow, and our heart starts racing.

When was the last time you felt stressed? What was happening in your body?

But that's not 'stress', that is DiStress, or **the stress response**. Let's take a step back... this is the good effects of adrenaline on your body...



# STRESS IS PRESSURE EXERTED UPON AN OBJECT THAT CAN EITHER STRENGTHEN OR WEAKEN IT



How do you define stress? Webster's Dictionary defines stress as "pressure exerted upon an object that can either **strengthen or weaken it.**"

So, repeated, applied stress at some point weakens the system and it breaks. Sometimes even strong materials can be subject to stress and break. Like firefighters...

**Question:** Can you give an example of how stress can strengthen you?

**Question:** Can you give an example of how stress can weaken you?

# STRESS MAKES YOU STUPID

- Stress activates the sympathetic nervous system
- An “old” response – in-place so you can survive emergencies
- This response hijacks the frontal lobe of your brain:
  - Cognitive functions like planning and creativity cease
- Your brain stem takes over:
  - Instincts... not thinking
  - Fight, or run.



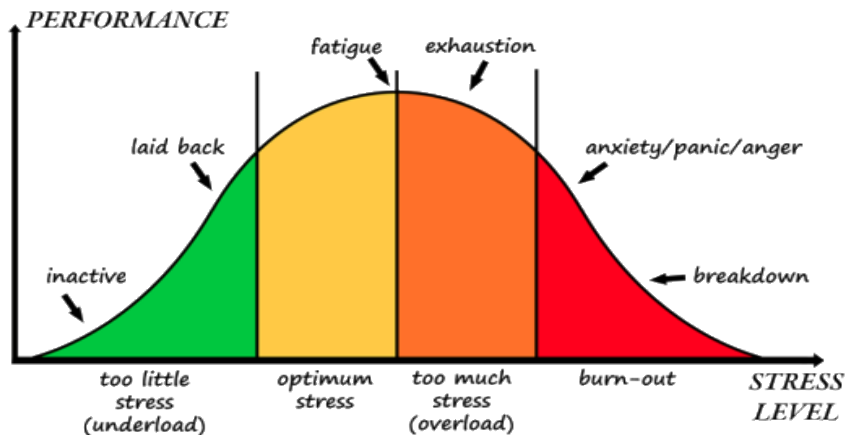
BUT – on an emergency scene we NEED to analyze a bunch of stuff! Stress actually disengages the frontal lobes of your brain – so you have NO higher functions, it’s a matter of priority...

stress harms people in many ways:

- It affects decision-making, making us too impulsive.
- It forces us to make mistakes.
- It causes us to ignore cues.
- It interferes with relationships with clients and colleagues.
- It lowers productivity.

BUT, we actually need some stress – it is only the extreme stress that makes us stupid...

# STRESS IS RELATIVE



Stress has a bad reputation, but once you get to know a little more about it, you find that stress is actually quite complex.

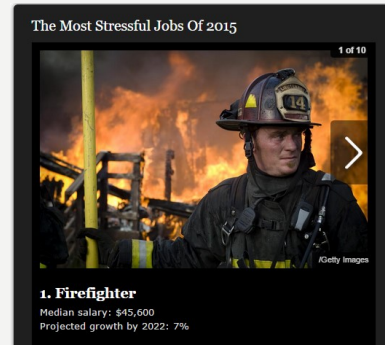
This chart shows how stress can affect our performance. When we talk about performance, we are talking about our capability to respond to a stressor or challenge.

When we are in the green zone, we are relaxed and laid back. This feels great but doesn't prepare us to respond to a stressor.

The yellow zone indicates optimum stress. This is called "Eustress." This is the stress that gets us ready to take a test, focus on a task, or get out of a sticky situation smoothly. As our stress increases, our performance tends to suffer, as you can see in the orange zone, as exhaustion sets in. Confronted with even more stress, we begin to experience anxiety and panic and our performance level is at its lowest. Now let's look at what is going on.

# MOST STRESSFUL JOBS IN U.S.?

1. Firefighter (71.59)
2. Enlisted military personnel (70.78)
3. Military General (63.11)
4. Commercial Airline Pilot (60.46)
5. Police Officer (50.82)
6. Actor (50.33)
7. Broadcaster (50.30)
8. Event Coordinator (49.93)
9. Photojournalist (49.22)
10. Newspaper Reporter (48.76)



CareerCast.com 2015/Forbes magazine 2015

As of 2018, some sources put “being the President of the US” as number one most stressful. That was before you-know-who was elected.

## STRESS IS RELATIVE



extreme visual clarity, tunnel vision, diminished sound, and the sense that time is slowing down. this is how the human body reacts to extreme stress.

— *Malcolm Gladwell* —

AZ QUOTES

**Acute vs chronic stress** – it's the acute form we're dealing with here. Stress can do these things to your senses.

## EFFECTS OF ACUTE STRESS

- “Tunneled senses” more accurately depicts the results of stress:
- For vision, it means your visual attention can be focused on one small geographic area of an emergency scene or one task being performed at a scene *and you miss seeing things in your periphery.*



**Many things happen in the peripheral vision that will be lost when vision is tunneled.**

The sympathetic nervous system also stimulates the skeletal system and muscular system in an effort to pump more blood to those areas to handle the acute stress. Simultaneously the sympathetic nervous system inhibits the digestive system and the urinary system in order to optimize blood flow to the heart, lungs, and skeletal muscles. This plays a role in the alarm reaction stage.

## EFFECTS OF ACUTE STRESS

- For hearing, it means your audible attention can be focused on one source of sound, like a person talking to you face-to-face or traffic on your radio, or a siren of an approaching engine
- When hearing is tunneled, you can miss hearing other things happening around you
- **ALSO** - a person intently listening to audible cues, like the radio or even a patient, could have diminished *visual* performance
- And a person intently focused on something visual could also have diminished *hearing*.



But a completely unexpected event occurred. While the *vision* was being tunneled, the performance of the *audible* control center decreased. That was not a typo. Tunneled vision led to diminished hearing. Turns out, focusing on something intently led the audio cortex to *turn down the volume*.

When the researchers performed an experiment to tunnel the *hearing*, the performance of the *visual* control center decreased. Again, no typo. Tunneled hearing led to diminished vision.

So it seems that we can really only pay attention (close attention) to one or the other. What are we missing when this happens???

## EFFECTS OF ACUTE STRESS



In some cases, when the stress is severe enough, the hearing receptors in the brain may shut off completely....

Neuroscience has a term for that: It's called *auditory exclusion*:

Police officers often report that under stress of a gun fight they are unable to recall how many shots were fired because *they did not hear them*.

How can someone NOT HEAR the shots they fired? Is this just something that is exclusive to law enforcement? OH HECK NO.....

And there's yet another effect of acute stress we have to think about...



## EFFECTS OF ACUTE STRESS

- Individuals who experience “time distortion” under stress report one of two forms of experience:
- For one group, everything appears as a “blur” as though events were stacked together almost into one moment:



Under conditions of extreme and life-threatening stress, people often report distortions of time. These distortional experiences are critical since, axiomatically, they occur in circumstances where small variations in behavior can mean the difference between survival and extinction. Professionals who are likely to meet such conditions in their occupations including those in aerospace, military, fire-fighting, law enforcement, and medical emergency service operations.

## EFFECTS OF ACUTE STRESS

- A second pattern has the individual reporting many different events with startling clarity as time itself appears to “slow down”
- Each of these patterns represents effects of time-in-memory that are evident in the memory of the event.



Some police have stated that they watched a bullet as it exited their gun - how can someone watch a bullet?

## EFFECTS OF ACUTE STRESS

- **When you are suffering from tunneled senses your situational awareness is vulnerable because you are likely to miss important clues and cues.**



Everyone reading this lesson has been in this situation many, many times. Don't be afraid to admit it.

## SO HOW DO WE OVERCOME THESE STRESSORS?

- Training is one way:
  - Scenario based training... the “What If?” situations
  - Also increases proficiency at your job
- **REMEMBER:** We will always fall back into that which we *are comfortable* when placed in a situation in which we *aren't comfortable*...



This is why we “overtrain” on certain situations – so we don’t have to “think” when we are overcome by the stress on those situations that we are trained-on. Since our frontal lobes are out-of-order we literally CANNOT think!

But what happens when we are presented with new, different situations?

***SO..... HOW DO WE  
OVERCOME  
THESE STRESSORS?***

- **“Master The Moment”**
- **Number One way to do this?**
- **Increase your knowledge of your situation – i.e. Situational Awareness.**



Focus ---- but not to the exclusion of everything else.

Multitask ----- but being open to unexpected situations

Train in context -----but be ready to slow down and avoid denial



**Situational awareness** or **situation awareness (SA)** is the perception of environmental elements and events with respect to time or space, the comprehension of their meaning, and the projection of their future status. Situation awareness has been recognized as a critical, yet often elusive, foundation for successful decision-making across a broad range of situations, many of which involve the protection of human life and property, like emergency response. Lacking or inadequate situation awareness has been identified as one of the primary factors in accidents attributed to [human error](#).

So, we've come full circle -

## **Gaining and Maintaining Situational Awareness**

- 1. What is Situational Awareness ?**
- 2. How do We Gain Situational Awareness?**
- 3. How can We Maintain/Improve our Situational Awareness?.**



So – let’s take a look at these three things: first what is SA, then how can we gain better SA, and then how can we maintain our SA....

# WHAT IS SITUATIONAL AWARENESS?

#1: The perception of elements in the environment, within a volume of time and space,

#2: The comprehension of their meaning,

and

#3: The projection of their status in the near future.



#1: what is around me, within the volume of time and space

#2: are these things around me a risk or a benefit to me

#3: are these things around me going to change (quickly) in the near future.

You've GOT to perceive the elements first – if you don't know about it – it WILL hurt you!

*What happened ? Where am I ? What is happening ? What could happen ?*



## THREE STAGES OF SITUATIONAL AWARENESS

1. *We have to see and sense : PERCEIVE IT*
2. *We need to understand what was actually seen: COMPREHEND IT*
3. *We have to use what we have understood to think ahead: PROJECT IT.*

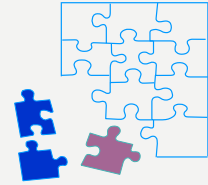


*To achieve good Situational Awareness, it is necessary to:*

- **gather** data (sensing, perception) seek cues in the environment
- assemble information to give **understanding** (comprehension), knowledge and experience
- then using this understanding for **thinking ahead** (projection), skilled thinking

Of these the second one seems to be the hardest for us. We see the elements in our scene, we hear them. But we just don't make the cognitive leap from "oh, yeah" to "wait, what's that?"

## HOW DO WE GAIN SITUATIONAL AWARENESS?



- Actively seek new data, use alternative sources where data are not available or difficult to detect;*
- Scanning and observing requires discipline;*
- Be aware of complacency;*
- Do not 'expect' to see something;*

***Sometimes you see only half of the picture***

Where data is not available or difficult to detect:

***but need all of it to understand the situation.***

Actively scan for new data, use alternative sources

Scanning and observing requires discipline:

Have a wide area of attention, avoid concentrating on one item

Use checklists to reduce errors - forgetting an item

Reduce workload, share tasks with other people

If distracted, return to the starting point

Be aware of complacency:

Take time to assess the visual scene, view it on several occasions

Cross check with others

Do not 'expect' to see something:

**Do not change what is seen to fit the mental model**

Review and update the mental model

Check alternative sources of data

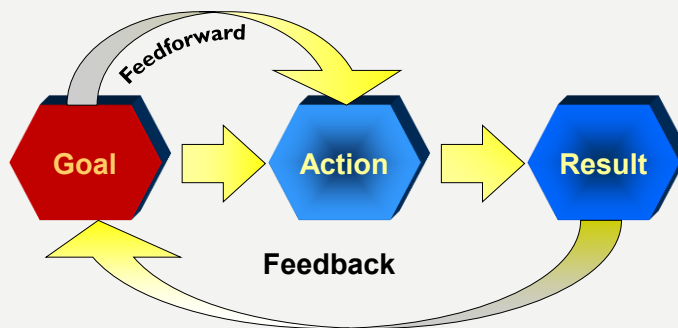
Check with others

**Gathering information** – seeing - sensing information can suffer from false information; visual illusion, or disorientation.

**Monitoring** : Humans have limits to how much we can see and hear at the same time.

## How do We Maintain Situational Awareness?

By using a **Decision-Making** loop we constantly check to monitor the results of our actions:



***Situational assessment is one of the most important parts of decision making.***

This assessment determines what strategy will be used and what the decision will be. ("***Crews must be willing to challenge their interpretations of situations, especially before making decisions and taking actions that have potentially severe consequences***").

This is nice, but what's the problem here????

# SITUATIONAL AWARENESS AND STRESS

I'm sure you've heard the last bit of  
information before –

*Just common sense, right?*

**First, common sense is not very  
common,**

**Second, we are under a great deal of  
stress when on an emergent scene.**



I can hear all of you thinking; yeah, yeah, yeah.....

Same old stuff, right?

# SITUATIONAL AWARENESS AND STRESS

We learned about “CFIT” and what can happen when you lose SA from pilots;

Now, let’s take a look at police officers, and how we can learn from them about SA and the affects of stress...



Remember what I said stress does to your frontal cortex – your ability to think? Stress turns off your ability to think and plan – common sense goes out the window along with your thinking. In the case of law enforcement (and, by the way, us in fire), adrenaline can make you dead. How can we relate the level of stress to our ability for SA????? – The Color Codes of Awareness

# THE COLOR CODES OF AWARENESS

- Condition White
- Condition Yellow
- Condition Orange
- Condition Red
- Condition Black
  
- This is the spectrum of awareness.



This is the levels of awareness that is used by Law Enforcement – let’s take a look at each one – and after defining each level I will show you a video clip on a story about a police officer down on a very nasty scene.

# CONDITION WHITE

OBLIVIOUS

- **Unaware and unprepared:**
- **Where we would be in a “perfectly safe world”**
- **Examples:**
  - **Walking, hands in pockets, focused on cell phone or ipod in the ears**
  - **Sitting on a park bench reading a novel**
  - **Driving your usual daily route, already at work mentally**
  - ***And whatever you are doing before your pager goes-off.***



WHITE:

Easily caught by surprise

Not even much aware of your environment – totally unprepared when something “out of the ordinary” happens

Your skill in martial arts, weapons, running like the wind, etc. does not help because you are not prepared to use those skills

## CONDITION YELLOW

AWARE

- **Relaxed but alert:**
- **Not paranoid, but aware**
- **Hands at your side, head up, looking around**
- **Examples:**
  - Crossing the street with busy traffic
  - Sitting in a new restaurant
  - What is that car that is following you toward home?
  - And hearing a Pre-Alert on your pager for your response area.



YELLOW:

Unless you are at home, this is the state you want to be in at all times; relaxed but alert to your environment.



# CONDITION ORANGE

ALERT

- **Identifying a specific potential risk, action or threat:**
- **Something out of the ordinary now has your attention**
- **Your pager just went –off in your response area for a structure fire**
- **Maintain your awareness**
- **Time to formulate a plan.**



## ORANGE:

Time to identify the validity of the threat or extract yourself from the opportunity  
Formulate the plan for if it is real

Adrenaline is now released – increasing your breathing rate and heart beat, but you still maintain your fine motor skills and awareness

You do not (yet) ignore your environment, and can recognize other risks and threats if they should appear. Your heart rate is over 100

## CONDITION RED

ENGAGED

- **You are engaged with the situation:**
- **Have your mental checklist ready**
- **If the situation calls for engagement, you are ready**
- **You arrive on-scene, prepared to do your job**
- **You have complete focus on the emergency.**



RED:

You are ready now. There are still problems with being too focused, as we have seen. But what happens if the situation becomes something outside your experience and training?

Emotional and instinctual responses are heightened, **BUT intellectual responses are lessened.**

Time distortion occurs when your heart rate gets over 120, and rational thought becomes more difficult if you are faced with something new

# CONDITION BLACK

TAC-OUT

- **You are faced with something outside your comfort zone:**
- **With a lack of programmed response, the mind cannot create new solutions**
- **Irrational or repetitive decisions are common**
- **Confusion, denial, tunneled senses, adrenaline overload causing hyperventilation.**



BLACK:

As intellectual processes shut down (the frontal cortex is not working) the mid-brain takes over: overwhelming the person's ability to think through the problem. The heart rate is over 175, and they cannot see straight. This "Amygdala Hijack" might cause a person to shut down mentally so they cannot take care of themselves or others.

# OFFICER DOWN: THE MATT PEARCE STORY

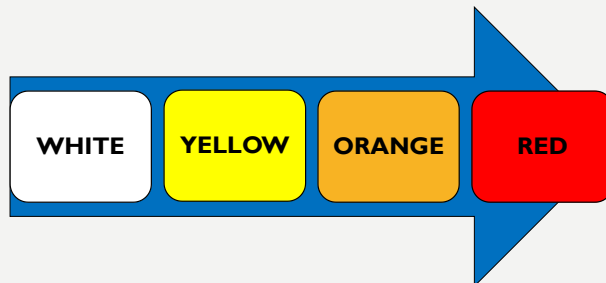
[HTTPS://WWW.YOUTUBE.COM/WATCH?V=JHXHN9X8QI4](https://www.youtube.com/watch?v=JHXHN9X8QI4)

Copy and paste the link above to watch video.

Officer Down – please watch this video, keeping what you have learned in this lesson in-mind. Can you identify when the officers involved go from white, to yellow, to orange, to red and finally to black?

## WHERE DO YOU WANT TO BE?

- You only want to be in Condition White when you know it is safe,
- You need to be in Condition Yellow, Orange and (occasionally) Red, while on an emergent scene;
  - As long as you can keep your Situational Awareness.



AS YOU GO FROM WHITE TO RED YOUR ATTENTION BECOMES MORE FOCUSED. Your best place is in the Orange range – where you are focused on the risk/threat, but you still have enough frontal cortex to be aware of your surroundings and can think through a new problem should one arise. In Red you have the increasing problem of too much focus on the threat, and can lose your SA.

# WHERE DO YOU WANT TO BE?

- You really do **NOT** want to be in **Condition Black** (ever)
- You do not want adrenaline to hijack your ability to think
- **Alertness, preparation, following the thought process through for situational awareness will hopefully keep you from ever having to be in the “Tac-Out” mode.**

<b>White</b>	Unprepared and unready to take action.
<b>Yellow</b>	Prepared, alert & relaxed. Good situational awareness.
<b>Orange</b>	Alert to probable danger. Ready to take action.
<b>Red</b>	Action Mode. Focused on the emergency at hand.
<b>Black</b>	Panic. Breakdown of physical & mental performance.

NEVER be in condition black!

## **MORAL OF THE STORY**

- **Stay in condition yellow:**
  - **Be aware of your surroundings**
  - **Be aware that your risk assessment is changing (always)**
  - **Already have a plan to avoid trouble**
  - **Visualize your plan**
- **Be ready to go to Condition Orange when you need to.**

## **THE FIX**

- **Collective Awareness – Empower your people**
- **Individual Awareness – Check your ego at the door**
- **Take a moment to identify your problem before applying a solution**
- **Ongoing reevaluation of the situation**
- **Don't be afraid to use plan B or C or D....**
- **Wisdom is power.**

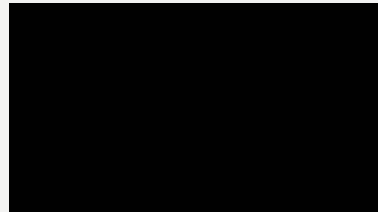


# **TEST YOUR SITUATIONAL AWARENESS!**

- **Three short videos to test your S.A.**
- **From the Department of Homeland Security;**
- **“If you SEE SOMETHING – SAY SOMETHING!”**

# TEST YOUR SITUATIONAL AWARENESS!

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=MYEAQG62PYA](https://www.youtube.com/watch?v=MYEAQG62PYA)



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Video number ONE

# **CONCLUSION**

- **We are all human!**
- **Know your limitations!**
- **You can't apply one solution to every problem!**
- **Look for clues that will help you**
- **Learn from failures – cause and effect**
- **Train often – and take training seriously**
- **Take the time to identify your situation!**

# CONCLUSION

- **Be SAFE out there!**
- **Thank you!**



Be sure to take the exam associated with this CEU module and send to the evaluator for CEU credit.