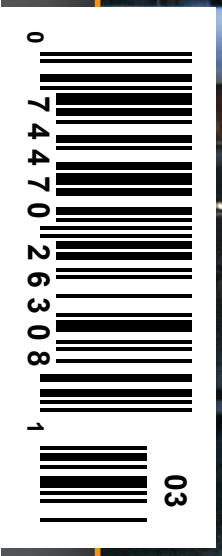
March / April 2018 - Issue #3

ASPIS

Advanced Superyacht Security



Workplace Violence and Warning Signs

Undoubtedly violence at working places such as superyachts is a very serious and often controversial issue with a lot of different approaches.

MANAGERS AND LEADERS. ARE THEY DIFFERENT?

FIRE ON BOARD; FACE THE CHALLENGE

COUNTERDRONE FACTBOOK

Superyacht Crews Security Training Program 2018

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- Perfect Safe Room
- Protection at Anchorage
- Restricting Access Onboard the Yacht
- Boarding Avoidance
- Anti-Robbery Technics
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- Preventive Actions Prior Sailing
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ASPIS is a proud member of NAVIS Media Network

Year 1 - Number 3 - March / April 2018

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ASPIS ISSN 2160-7958 (Print)
ASPIS ISSN 2160-7966 (Online)
ASPIS is a bimonthly publication:
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201 S. Biscayne Blvd., 28th Fl, Miami, Florida, 33131
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Maritime Crime Attacks Registered in 2018

11 Incidents Reported

10 Suspicious Activity

1 Vessels Boarded

Horn of africa date time: 6/1/2018
Status: suspect activity
Information received from 3 mv of 3 suspicious grey-hulled craft w/ up to 6 armed pob in each. West of al hudaidah, yemen, red sea. Craft within 1 cable. All vessels safe. Heightened vigilance advised - 6 jan 2018. Oceanus live

Horn of africa date time: 9/1/2018
Status: pirates approach
Details: mv reported 2 suspicious skiffs approach, each w/ 5 masked pob in bab el mandeb strait. Skiffs within 3 cables abort approach due to rough sea state. Vessel safe - 9 jan 2018. Oceanus live

Gulf of aden: on 21 january, the bulk carrier nacc valbella was headed from the suez canal to cebu, in the philippines, when the ship was approached. The incident occurred 90 miles southeast of the yemeni port of mukalla in the gulf of aden. The vessel's owner said all crew were unharmed. A security company spokesman said that a mothership pulling two skiffs approached the vessel's bow. The vessel's armed guards initially fired a flare, but the mothership continued its approach. The guards then fired an aerial warning shot, to which the assailants responded with shots. The perpetrators fled after the guards fired a second warning shot. Source oni.

Gulf of aden: on 20 january, a small boat made a suspicious approach against a panama-flagged merchant vessel under escort by a chinese navy frigate in the western gulf of aden. The naval vessel fired warning flares and positioned itself for further action against the small boat, forcing it to turn away.

Horn of africa date time: 18/02/2018 05:30:00 utc
lat: 13°59'2 n lon: 51°40'1 e
Status: suspicious activity
Detail: suspicious approach by a number of skiffs reported at 0530 utc in position 13:59.2N - 051:40.1E, in the vicinity of pt b irtc, gulf of aden. Mv last position 13:54.49N - 051:27.06E at 0740 utc. Skiffs no longer within visual range. Vessel safe. Reported (ukmto) 18 feb. Source: oceanus live.

Horn of africa date time: 22/02/2018 21:12:00 utc
lat: 3°26' n lon: 50°27' e
Status: suspicious activity
Detail: mv attacked by 3 skiffs at 2112 utc in position 03:26n - 050:27e, around 158nm off somali coast, indian ocean. Shots fired at mv, embarked ast returned fire. Skiffs no longer visual; master confirmed vessel is safe. Reported (ukmto) 22 feb. Source: oceanus live.

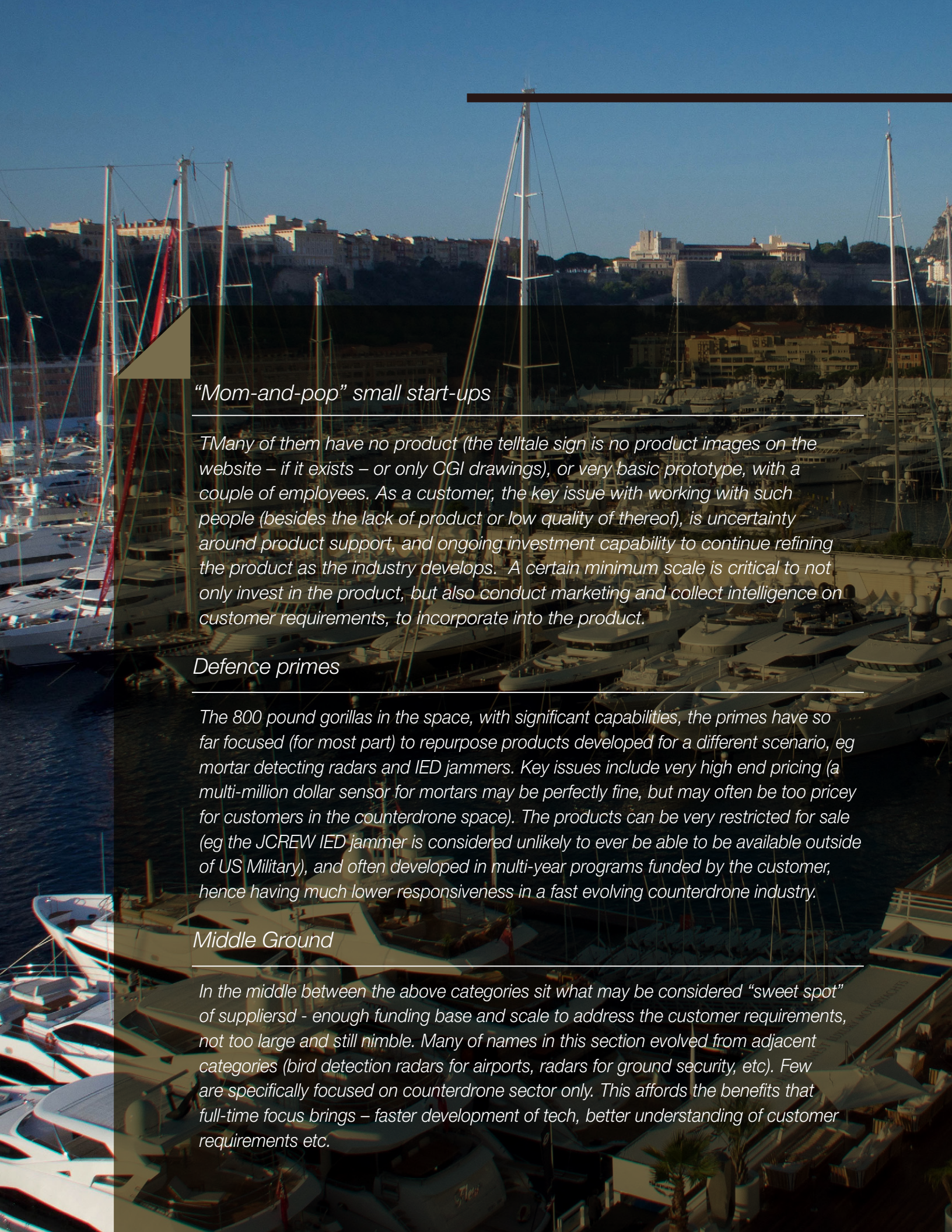
Horn of africa date time: 01/03/2018 16:00:00 utc
lat: 13°5'6 n lon: 43°5'0 e
Status: suspect_activity
Detail: mv reported approached by 4 skiffs, 3 white, 1 blue to within 0.5Nm (time not stated) in position 13:05.06N - 043:05e, bab el mendeb strait, s red sea. 4-5 Pob each skiff. Ladders and drums potentially sighted. Vessel and crew are safe. Reported (ukmto) 1 mar. Source: oceanus live

Horn of africa date time: 08/03/2018 09:20:00 utc lat: 12°32'0 n lon: 43°27'0 e status: suspect activity detail: mv reported approached at 0920 utc in position 12:32n - 043:27e, around 6nm s of perim island, bab el mandeb strait, southern red sea. 3 Skiffs w/ 3-4 pob each. Vessel and crew safe. Reported (ukmto) 8 mar. Source: oceanus live

Horn of africa date time: 31/03/2018 05:35:00 utc
lat: 13°57'0 n lon: 51°43'0 e
Status: pirate attack
Detail: update: two skiffs with two armed pirates in each skiff chased and closed in on underway tanker at 0520 utc in position 13:58.1N – 051:25.3E, gulf of aden. Alarm raised and crew mustered. When the skiffs closed to around 100m from the tanker, the pirates fired upon the tanker. Embarked armed guards returned fire, resulting in the pirates aborting the attack and moving away. All crew safe.
Ship sustained minor damage due to the firing. Ladders sighted in the skiffs. Reported (imb/ukmto) 31 mar. Source: ol bravo

Horn of africa datetime: 03/04/2018 09:15:00 utc
lat: 14°29'3 n lon: 42°11'2 e
Status: suspect activity
Detail: update: [incident] saudi arabia-flagged vlcc tanker reported an explosion approx 0915 utc in position 14:29.3N - 042:11.2E, around 48nm wsw of hodeidah, yemen, s red sea. Saudi coalition report states minor damage suffered from likely projectile. Coalition warship responded and attack was aborted. Houthis rebels confirmed attack on tanker. Reported (ukmto/spa) 3 apr. Source: ol bravo

Horn of africa datetime: 08/04/2018 07:24:00 utc
lat: 12°34'0 n lon: 43°22'0 e
Status: approach
Detail: underway tanker approached by two skiffs at 0724 utc in position 12:34n – 043:22e, bab el mandeb tss, southern red sea. Skiffs approached on the starboard and port sides, vessel sounded alarm, and embarked ast fired flares and warning shots, displaying weapons. Two more skiffs sighted 20 mins later. Further warning shots fired resulting in skiffs stopping and turning away. Reported (sources) 8 apr. Source: ol bravo



“Mom-and-pop” small start-ups

TMany of them have no product (the telltale sign is no product images on the website – if it exists – or only CGI drawings), or very basic prototype, with a couple of employees. As a customer, the key issue with working with such people (besides the lack of product or low quality of thereof), is uncertainty around product support, and ongoing investment capability to continue refining the product as the industry develops. A certain minimum scale is critical to not only invest in the product, but also conduct marketing and collect intelligence on customer requirements, to incorporate into the product.

Defence primes

The 800 pound gorillas in the space, with significant capabilities, the primes have so far focused (for most part) to repurpose products developed for a different scenario, eg mortar detecting radars and IED jammers. Key issues include very high end pricing (a multi-million dollar sensor for mortars may be perfectly fine, but may often be too pricey for customers in the counterdrone space). The products can be very restricted for sale (eg the JCREW IED jammer is considered unlikely to ever be able to be available outside of US Military), and often developed in multi-year programs funded by the customer, hence having much lower responsiveness in a fast evolving counterdrone industry.

Middle Ground

In the middle between the above categories sit what may be considered “sweet spot” of suppliersd - enough funding base and scale to address the customer requirements, not too large and still nimble. Many of names in this section evolved from adjacent categories (bird detection radars for airports, radars for ground security, etc). Few are specifically focused on counterdrone sector only. This affords the benefits that full-time focus brings – faster development of tech, better understanding of customer requirements etc.

BY OLEG VORNIK

Photography: Pablo Ferrero

Counterdrone Factbook

With counterdrone technologies rapidly coming to market to address the quickly growing drone threat, it becomes increasingly difficult for the prospective users of the technology to separate effective and value-for-money products to a very large number of inferior alternatives.

Broadly speaking, there are three types of providers: "Mom-and-pop" small start-ups, Defence primes, and Middle Ground.

What to look for in a counterdrone product

Multi-sensor detection solution

The main drone detection methods today include radar, radiofrequency and acoustic sensors, as well as optical and thermal sensors for identification.

More exotic detection sensors such as LIDAR exist, however have not been widely proven in field applications to be effective at this point.

It is important to understand that no future-proof "silver bullet" exists, and the role of the counterdrone systems and manufacturers is to keep up with the drone technology, and evolve with it.

What to look for in a radar

A radar is effectively a motion tracker. Key parameters, in simple terms, include:

- resolution: it is critical for the radar to be sufficiently fine resolution to detect small drones (DJI Phantom grade and below), at meaningful distances (close to 1km). Numerous radars have been design to detect large shiny metal objects (aka planes, helicopters) and are less suited for detecting small, carbon body objects flying closer to the ground (drones)
- azimuth coverage: horizontal coverage angle. This normally ranges from 90 degrees to 360 degrees, with multiple radars used to deliver a wider angle, if required, for sub 360 degree units
- vertical angle: this is greatly underlooked by a lot of customers. A lot of radars on the market are narrow (10-30 degrees), meaning significant blind spots, especially as the drone gets closer. While a 90 degree vertical coverage is not usually needed (ie detecting a drone directly overhead from the sensor), 40-80 degree detection is considered optimal
- 2D vs 3D: 3D radar has several advantages, including giving the elevation data on the target, as well as ability to reduce clutter but filtering

objects past certain heights (and thus eliminating ground based false alarms)

- Portability: unless a fixed installation, formfactor and ability to mount relatively quickly and easily on a mast is important
- Moving vs fixed panel: less moving parts is preferable, as reduces wear and tear and likelihood of things breaking

Certain manufacturers have been working on software features for a radar to differentiate between drones and other objects, such as micro-Doppler, Artificial Intelligence, etc. While encouraging concepts, noen of those technologies are reliably performing at present, and the user is advised to always see the technology themselves in action. It is worth noting that micro-Doppler effect is expected to reduce significantly once the drone blades will be required to be enclosed (an expected safety development, given reported incidents of drone blades creating injuries etc)

What to look for in a radiofrequency sensor

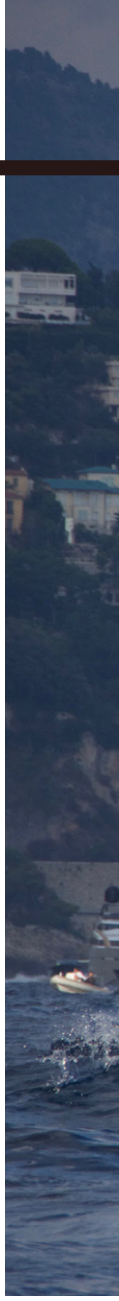
RF sensors work (for most part) by matching drone communication protocols to a signature in the Rf sensor library. Multiple drone models sharing same protocol (eg LightBridge, Occusync etc) will map to same signature. The desired features are:

- Reliable mapping protocols with a large RF library, to give large probability of detection and low false alarm ratios (note: certain false alarms such as IP cameras, may be unavoidable, but should be able to be whitelisted by the software)
- Azimuth and vertical coverage angles (similar argument to that for a radar, as abovementioned)
- RF DF (direction-finding) capability – as opposed to an omnidirectional or “sector” alarms. RF DF gives a narrow beam (couple degrees) that can be used to point in the direction of the drone, and also triangulate in a reasonably precise manner, with 2 or more RF sensors
- With RF sensors generally much longer reaching than radar (up to 5km in a low clutter situations), this ability to triangulate on a target without a radar, gives a significant advantage from cost perspective
- Passive nature - no interference with other devices, and more difficult to discover by “enemy forces” through Rf emissions

With the coming advent of LTE controlled drones, Rf sensor technology will require to continue to evolve. Another common question is performance of the RF sensors for “autonomous” drones. While many so-called autonomous drones still emit telemetry and video data, making it detectable to the Rf sensor, such drones with an SD card (or similar) can be much more invisible – thus requiring reliance on other sensors to Rf.

What to look for in an acoustic sensor

There are two types of acoustic hardware for drone detection generally available today – arrays and single-microphones. Arrays give advantage of more precise location of the source, however significantly more expensive vs single mic hardware, and still materially worse performance compared to radar or Rf sensors.



Acoustic software works by removing the background clutter from noise made by the drone blades and engine, and comparing it to the database of acoustic signatures. Similar to the Rf sensor, multiple drones will likely map to each signature, and the library needs to be regularly updated to stay up to date. It is worth noting that some of more recent drones (eg DJI Mavic Pro) are significantly quieter compared to earlier generations of drones, making the job of acoustic sensors more challenging.

Acoustic sensor technology is expected to respond well to AI, however to date has not been incorporated in a meaningful way.

Optics and thermal

Optics and thermal are common parts of drone detection systems, however it is important to understand the distinction between detection and verification. Camera and thermal performance is a trade-off between FOV (field of view) and distance – greater the angle that is being monitored, less the distance. Even best quality cameras will not detect a drone as anything more than few pixels even at couple hundred meters, with a 90 degree plus field of view.

Thus the best application for camera/thermal is slew-to-cue from the detection provided by the primary sensors. A dot on the map (as opposed

to general direction) is very helpful, as allows the camera to auto-zoom. At this point, video analytics can kick in for further identification (or an image taken to act as proof of evidence of drone intrusion).

What to look for in a mast

Last but not least, how the sensors are mounted is important. Pump-up/hydraulic masts may look impressive during demos, but have a tendency to break down in-field. As with other equipment, less moving/motorized parts translates into more durable hardware which is less likely to break in-field. A durable mast with a manual mechanism for extension, is recommended. A mast should also have capability to be firmly attached to the ground (and with cords for additional balance), with no swaying in the wind. Permanent installations to infrastructure such as telecommunications towers, often works well.

Defeat solutions

Broadly speaking, the defeat solutions available today include kinetic/"hard kill" (bullets, nets, lasers etc) and non-kinetic/"soft kill" (jammers, cyber/hacking).

It has generally been accepted that soft kill is the better solution due to:

- Reduced collateral damage (eg a bullet flying past a drone and hitting another object, drone's payload exploding upon kinetic impact etc)
- More reliable targeting (a jammer generates a cone of impact that is much easier to catch the drone with, versus a bullet or a net, especially as the distance to the drone increases)
- Ability to defeat a swarm/multiple drone attack (as a jammer covers an area, and multiple jammers can completely lock the airspace)
- Ability to recover drone for forensic investigation

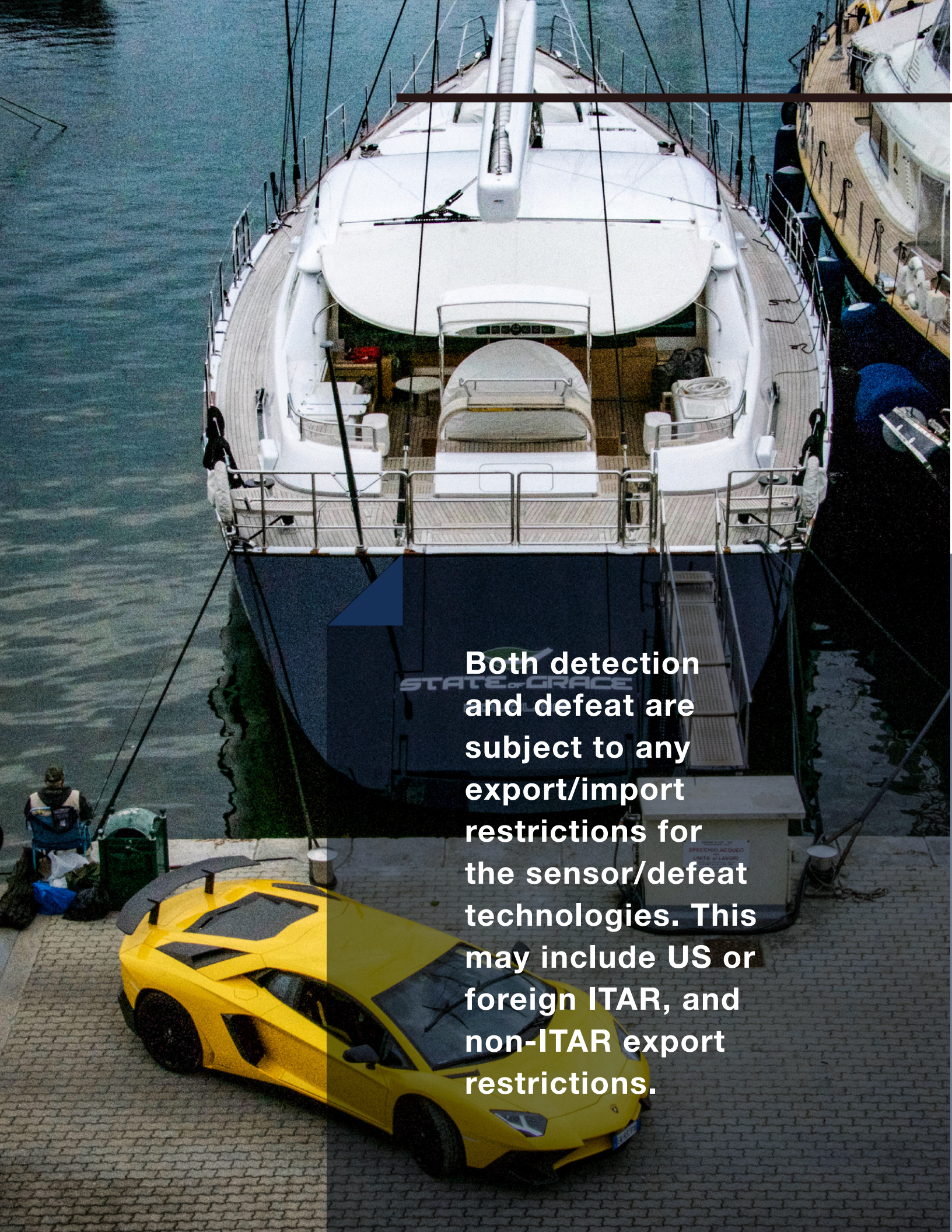
Jammers are considered a superior technology to "hacking" as they are a universal protection – targeting bands on which the drones operate, as opposed to relying on having a library of hacks for various communication protocols, each of which can be closed up as the manufacturers continue to make the communication links increasingly secure. Some of the militaries today are starting to look at systems with both soft kill and hard kill capabilities.

The jammer works by sending a strong signal on same frequency band as the drone uses to communicate with the controller and GPS satellite, forcing the drone to go into a pre-set emergency protocol. This generally involved flying back to starting point if the GPS connection remains available, or landing on the spot is the GPS linkage is also severed. In the latter case, some drones may also freeze and hover at a small distance above ground, until their batteries run out.

The drones today communicate on 2.4Mhz and 5.8Mhz bands for most part (for both navigation and video), with some drones utilising 433Mhz and 915Mhz bands. These are considered "unallocated" bands across the world (as opposed to say cellphone or emergency broadcast frequencies), and drone manufacturers (along with wifi, radiofrequency controlled toys, radios etc manufacturers) are required to stick to those bands by law. Changing the communication band "in a garage" is very difficult for a non-State agent (unlike, say, changing blades/engine or adding custom payloads).

Jammers generally come as directional ("cannon-like") and omnidirectional. As it takes approximately 60 seconds to defeat a drone (for the comm links to terminate and the drone commence the response sequence), systems that can defeat drones from multiple directions at the same time, are considered optimal. Handheld jammers, especially in shape of rifles, have become popular directional jammers in recent period, with ability to effect the target at a greater range (for a given amount of portable jammer power) and a reduced interruption of radiofrequency spectrum outside of the intended direction.

The defeat solutions available today include kinetic/"hard kill" (bullets, nets, lasers etc) and non-kinetic/"soft kill" (jammers, cyber/hacking).



Both detection and defeat are subject to any export/import restrictions for the sensor/defeat technologies. This may include US or foreign ITAR, and non-ITAR export restrictions.

GPS/Glonass jamming is also helpful as an option to triggered the abovementioned "emergency landing" mode.

A common question arises as to what happens to "autonomous" drones. Severing their Rf links will cut the video feed to the operator immediately, and jamming GPS will trigger emergency landing, similar to the normally navigated drone.

As of this time of writing, no reliable "inertial navigation" exists in the way that the drone continues to travel to its target location while jammed.

As a jammer is an emitter device, safety for use certifications from an accredited lab are important.

A note of caution is to be aware of "mini jammers" coming into the market now – very short, handgun-shape products. Power of a jammer links to size of its "engine" as well as size of the antennas. Even sophisticated jamming designs tend to produce a weak result, once they are too "minituarised". Staged demos will often look impressive, but the customer is always encouraged to do own field trials.

Control panel

An easy to set up, understand and use control console is critical in the environment where the user is not expected to be deeply technical.

Good control systems combine ability to work completely standalone, and also connect to a cloud for updates and remote assistance, if required, in a secure manner.

Legal restrictions

This report does not constitute legal advice, and readers are urged to seek own advice on legal restrictions regarding purchasing and using counterdrone technology.

With detection solutions, the main concern is privacy breach – sensors recording and storing data without consent of the audience. This varies between locations, types of sensors, how the data is collected, stored and shared, and who is using the sensors.

With defeat solutions, step 1 is whether its legal for the user to apply counterdrone products. A user can be barred from any counterdrone products (eg FAA prohibits interference with drones in the US, on the basis they are treated same way as ordinary aircraft), or around regulations regarding a specific countermeasure (eg FCC and similar communication authorities around the world restrict interference with radio waves for most customers. As a general rule of thumb, non-government customers in most countries cannot jam. Government and military users have own protocols, which exist both for domestic use (eg only at certain military base locations in the US) and forward deployment overseas. For yacht owners, container ships, offshore oil rigs etc, Law of High Seas may apply.

Both detection and defeat are subject to any export/import restrictions for the sensor/defeat technologies. This may include US or foreign ITAR, and non-ITAR export restrictions – many of such technologies require either (or both) export and import licences from the relevant Government agencies.

BY NICK KASIMATIS

WORKPLACE VIOLENCE AND WARNING SIGNS

Photography: Pablo Ferrero

Undoubtedly violence at working places such as superyacht is a very serious and often controversial issue with a lot of different approaches. This article will try to identify the profile of people prone to workplace violence and most important, warning signs.

The recent years great improvement has been made at the number of violence incidents at working place. But even if the rate of nonfatal violence has declined by 62% from 1993 to 2012 and by 35% from 2012 to 2016, still almost 572,000 individuals every year suffer from violence in working places (U.S. Department of Justice, 2016). Therefore there is still room for improvement. Even if statistic rates decline the absolute number of victims is still big, if we take in consideration that these incidents affect the quality of lives of each and every one of us.

Modern societies and developed countries cannot tolerate the existence of violence in everyday life.

FOUNTAINHEAD

General considerations

1. Definition of workplace violence Occupational Safety and Health Administration defines workplace violence as the violence against workers (U.S. Department of Labor, 2002). A much broader definition should include violence against workers and customers as well, and divide this violence in forms such as physical, sexual, emotional, psychological, spiritual, cultural, verbal abuse and financial abuse.

The challenge is how to recognize these types of violence such as psychological violence which sometimes implies other forms of violence, such as physical which may prove fatal.

2. Types of violence in workplace:

Physical: It takes place when somebody uses or tries to use physical power in order to subdue and control someone else's willingness and actions.

Sexual: Sexual actions enforced to a person without his/her approval.

Emotional: It is a set of harmful behaviors by one partner to another to dominate him/her.

Psychological: Degrading, humiliating are examples of behavior that harms someone psychologically. Often the discrimination between emotional and psychological violence is difficult to be recognized. Usually, employers exercise psychological violence to employees by manipulating their power and authority.

Spiritual: Spiritual and emotional violence often occur at the same time. This kind of violence harms the spirit. There are many ways of doing so, such as ignoring somebody's opinion, public humiliation etc.

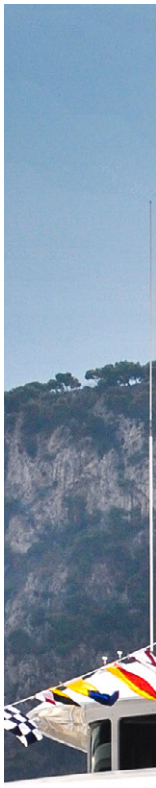
Cultural: In that type of violence cultural differences, such as religion, language, cultural preferences are the cause of the violence.

Verbal abuse: It is one of the most common kinds of violence. In the workplace, many employers or customers express negative statement about somebody's actions or performance. It is also insidious and therefore is dangerous with devastating impact on people. A lot of crimes have occurred as reaction to verbal abuse.

Financial abuse: It takes place when somebody manipulates his economic power in order to control and suppress individual's actions and willingness.

3. Jobs exposed to high risk violence According to the US Bureau of Justice Statistics (BJS), nearly 2 million people are the victims of workplace violence each year from simple assaults to aggravated assaults. Even though police officers, correction officers, and taxi drivers are at the highest risk of becoming victims of workplace violence, research indicates that, in general, anyone working in a position in which they handle cash or other valuable items or provide service to the public or to customers, like super yacht crews which have direct contact with them, are at risk.

4. Historical data of violence in working place. Workplace violence statistics reveal how dangerous and risky it is to be an employee. Most career seekers and employees assume their potential place of work will be safe and secure. Unfortunately, this is not always the case. Workplace violence is very real, can explode anytime, and anywhere.



"The Occupational Safety and Health Administration defines workplace violence as the violence against workers. A much broader definition should include violence against workers and customers as well, and divide this violence in forms such as physical, sexual, emotional, psychological, spiritual, cultural, verbal abuse and financial abuse."

Jobs involving with the public have the greatest risk of becoming a workplace violence statistic. There were about 78% of incidents involving fistfights or other physical actions; a shocking 17% were shooting, with one death reported as a results. Also, about 6% of the violent acts were committed by an employee toward another employee, 13% by an employee to supervisor, and 7% by customers against employees. Males committed more than 80 % of the violence, and serious harm was reported to have occurred in 22% of the cases. Medical treatment was administered to 42% of those involved.

Organizational factors

These factors include a range of conditions and actions that are professed by people and are influenced by other individuals of the organization.

1 Distributive injustice

Distributive injustice is perceived as the unfairness associated with the outcomes. These outcomes may be material like the salary of the employee or can be insubstantial like negative comments on the employee's work and effort.

2 Procedural injustice

Procedural injustice is the unfairness associated with the procedures used in order to arrive to outcomes. This factor usually leads the employees to express aggressive behavior against the organization, because the procedures and measures are determined by the organization.

3. Situational constraints

Situational constrains are stressful conditions that interfere with the employee's work routine. These stresses lead the employee to negative emotions which obstruct his performance and goals.

4 Job dissatisfaction

Job dissatisfaction refers to whether individuals like their job or not. People who are displeased with their job they are likely to be less productive by many ways and therefore they act in destructive ways toward the organization.

5 Rigid rules and procedures.

This factor is met in many violent reported incidents. There are cases where the organization objectively has rigid rules and procedures and there are cases where the employees percept the policies of the organization as rigid and strict. In both cases the outcomes are similar as the employee feels to work under pressure and that leads him to express aggressive behavior against the organization.

6 Adverse work conditions.

Although the adverse work conditions and their relation to violent behavior, and their correlation has been demonstrated to be of low-level, however up to some point they do influence the individuals' behaviors. Adverse work conditions usually include high levels of noise, high or low temperatures, overcrowding, working with hazardous materials, jobs that require high physical effort and jobs that include threats to safety.

Human factors

These factors refer to stable personality traits and other factors which are different between people and they influence the way they react.

1. Trait anger

Trait anger is the predisposition of an individual to react to certain situations with

hostility. Some individuals are more prone to trait anger than others and are likely to become more easily provoked because they percept different situations as frustrating. Because of that tendency these individuals become more easily aggressive and they are involved in incidents of violence.

2. Negative affectivity

Negative affectivity is the predisposition of an individual to express dissatisfaction and to experience distressing emotions such as stress, frustration, fear, hostility and anger. Some individuals are more prone to negative affectivity and are more sensitive and more reactive to negative conditions and events. Although is normal for people to feel bad under certain situations, however individuals high in negative affectivity have the tendency to feel bad more often.

3. Gender

The majority of the studies have shown that males are more prone to violent behaviors than females. On the other hand there are indications that gender differences may not be as great for less obvious forms of violence such as gossip and stealing.

4. Age

The association of age and expression of violence has been studied by several behavioral scientists and the majority agrees that age is associated with the level of violence. Usually younger individuals are more prone to aggressive behaviors than older people. The most possible explanation for this is that as people grow older become more mature and can understand better the consequences of their actions and so they can have a better control over their anger.

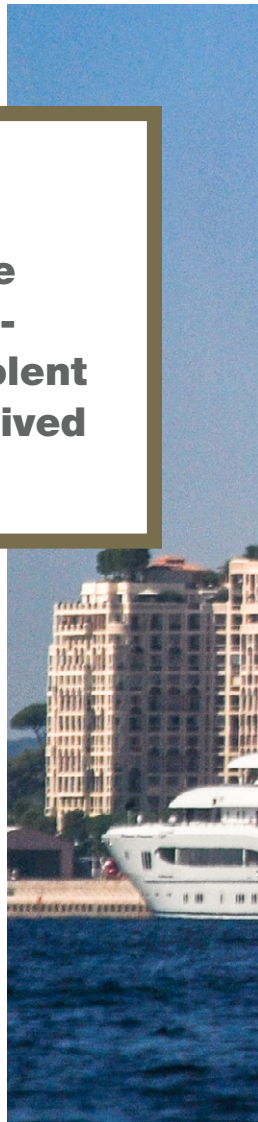
5. Use of alcohol and drugs

The excess use of alcohol and drugs is associated in most of the times with the expression of aggressive behaviors. The fact that these individuals show violent behaviors across a variety of settings (family, relationships, and intimate partners) makes them potentially violent individuals at their workplace.

6. Past history of aggressive behavior

Individuals with a past history of violent behavior have been associated with increased incidence of workplace violence. A violent personality is characterized by a stable psychological behavior of violence. Such individuals usually express aggressive behaviors in different aspects of their social life including their place of work.

The worker isolates him or herself from the input of others, enters the mode of self-protection and self-justification in which a violent act may come to be perceived as the only way out.



Organizational and human factors interaction

As described above both organizational and human factors can influence the process of violence at workplace. However many different interactions among these factors are likely to cause violent behaviors at workplace. If the organization has an aggressive culture and the employee is prone to violent behaviors, it is more likely that this combination will lead to the development of violent acts.

Indications of potential commitment of act of violence

Workplace violence seems to have an evolution creating a spiral which begins when the individual encounters an event (actual or perceived) he or she experiences as frustrating or stressful. The worker isolates him or herself from the input of others, enters the mode of self-protection and self-justification in which a violent act may come to be perceived as the only way out. The final step is in the violent act itself, which may occur from hours to months later.

There are no absolute predictors of violence; however, these are some guidelines and recommendations.

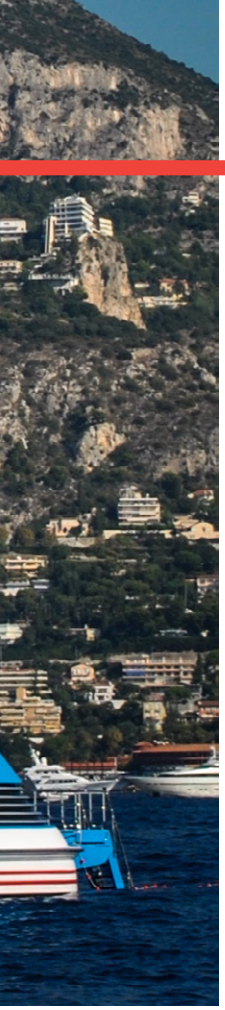
1. Threats are often a prelude to violence; threats and gestures should be taken seriously.
2. Significant changes in the worker's mood, behavior, or personality may signal the potential for violence.
3. Disorganized physical appearance or dress; changes in facial appearance or attempts to conceal the face: evidence of substance abuse, severe agitation; verbal argumentativeness or threats, especially to specific persons and

threats or talk weapons could be a warning of impending violence.

Workplace violence can be viewed in four stages: the anxiety phase, the defensive phase where the employee comes to feel increasingly trapped and out of options, the acting-out phase where the employee has already lost some control, and the tension-reduction phase where the immediate crisis has passed and the employee should be ready to accept help to reduce his or her level of tension. Workplace violence prevention should receive the same priority as fire prevention.

It is impossible to predict what anyone else is going to do. But according to experts, there are enough indications of impending violence to pay attention to, so that an individual's risk for violence can be appraised. Those who study workplace violence know that there is a psychological profile of someone who is likely to commit an act of violence. A combination of a few (or more) of the following behaviors should be reason for concern.

- Difficulty getting along with others: They are unreasonable and often make inappropriate remarks about others. They are never content with the status quo and are always upset by everyone and everything.
- Controlling behaviors: In their minds, they are superior and everyone else is beneath them. They always force their opinion on others. They are control freaks and can't deal with change.
- Clinical paranoia: They may not yet be diagnosed, but they think others—including their friends, family, fellow employees and the government—are out to get them. They are conspiracy theorists.
- Power obsession: They own firearms, are members of paramilitary groups, and subscribe



to numerous military, law enforcement or underground military group chat communities or newsletters.

- Victim attitudes: They never take responsibility for their behaviors, faults, mistakes or actions. They always blame others; it's always someone else's fault.
- Litigious nature: Taking legal action against neighbors and employers and constantly filing grievances is their way of virtually controlling others.
- Constant anger: Hate and anger are how they get through the day. Coworkers, family, friends and the government are all the reasons why they are mad.
- Violent opinions: They see acts of violence in the media, such as shootings, domestic violence as reasons to celebrate.
- Vindictive references: They say things like, "He will get his someday," or "What comes around goes around," or "One of these days I'll have my say."
- Odd behaviors: They might be good at their jobs but lack social skills. Their presence makes others feel uncomfortable. They have an edge to them that makes others not to want to be around them.
- Unhealthy habits: Sleep disorders, always being tired, dramatic weight loss or gain, or numerous health-related problems issues plague them. They are often addicted to drugs, alcohol or numerous other substances.
- Recent layoff: A combination of any of these traits that leads to job loss can set an ex-employee off.

Prevention and Corrective Actions

Workplace violence causes a significant number of workplace fatalities and injuries around the world. But most important in Superyacht industry is the impression an angry crew gives to the customer who has paid a huge amount of money for calm and relaxed holidays and on the contrary he deals with aggressive behaviors. This situation could ruin the whole reputation of a company. Data on workplace fatalities show assaults and other violent acts are among the leading causes of work-related deaths.

In the short-term, employers can take steps to make the workplace safer.

In the long-term, these steps will not be fully successful unless the underlying causes of violence are addressed. It is critical for businesses that labor agencies, the society, education entities, law enforcement and government agencies undertake a collaborative approach to prevention.

1. Proactive Steps to prevent Violence in the Workplace

Although, making sure your business has solid workplace-violence education and response policies in place, employment screening can go a long way toward preventing workplace violence before it happens. The value of these screenings can literally be measured in lives. Weeding out potential violent workers before they have an opportunity to act before they are hired is one way to make workplaces safer.

Screening potential employees for

such factors as work history, criminal backgrounds, references, drug and alcohol use can render foreseeable and preventable workplace violence a thing of the past. With the expenses for workplace violence running about five times more than prevention, it also makes fiscal sense to screen.

2. Reaction to workplace violence

Violent behavior must not be seen as an isolated event but as a process. The intervention starts at a baseline, moves to a pre-assault stage, and continues to what is called the assault stage.

At the baseline, personnel observe factors concerned with the customers, environment and service-giver.

The pre-assaultive stage encompasses three interventions:
1) prevent fear, insecurity, and anxiety;
2) reduce the outburst of anger;
3) decrease agitation.

The assault stage requires efforts towards psychological, physical and pharmacological levels.

Traditionally the focus has been on physical violence towards personnel but in recent years more attention has been paid to the non-physical violence. In a resent investigation work related violence was defined as both verbal and physical aggression.

Preventive interventions can include reviewing work environment activities and procedures with regard to threats and acts of violence.

There are several measures companies can take to restore confidence after a workplace violence incident. This begins with messages from the top management emphasizing the company's willingness to take justifiable responsibility, address the causes of the incident in a forthright manner, provide services for all who need them, and take every necessary step and reasonable action to prevent a similar incident from recurring.

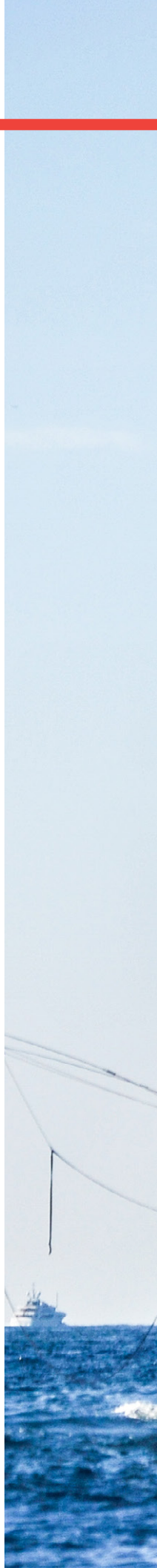
A positive outcome that can emerge from a workplace violence incident is in the nature of what can be learned in order to reduce the chance of similar tragedy happening in the future.

Organizations that encourage a fair and honorable corporate culture are more likely to earn the respect and loyalty of their employees and reduce the risk of avoidable tragedies.

Conclusion

Many forms of violence can occur against workers, customers/clients, such as physical, sexual, emotional, psychological, spiritual, cultural, verbal abuse, and financial abuse.

Research indicates that any individual can face or cause violence acts at the workplace. Employers can take steps to make the workplace safer and these steps will not be fully successful unless the underlying causes of violence are addressed. All businesses today must undertake collaborative approaches to prevent the workplace violence thus protect their reputation, ensure smooth operations and avoid serious legal and other expenses.



NERO

BY DIMITRIS RAFTOGIANNIS

Managers and Leaders. Are they different?

Photography: Pablo Ferrero.

The difference between managers and leaders lies in the conceptions they hold, deep in their psyches, of chaos and order. Managers embrace process, seek stability and control, and instinctively try to resolve problems quickly-sometimes before they fully understand a problem's significance. Leaders, in contrast, tolerate chaos and lack of structure and are willing to delay closure in order to understand the issues more fully. In this way, Zaleznik argued, business leaders have much more in common with artists, scientists, and other creative thinkers than they do with managers. Organizations need both managers and leaders to succeed.

The managerial culture emphasizes rationality and control. Whether his or her energies are directed toward goals, resources, organization structures, or people, a manager is a problem solver. The manager asks: "What problems have to be solved, and what are the best ways to achieve results so that people will continue to contribute to this organization?" From this perspective, leadership is simply a practical effort to direct affairs, and to fulfill his or her task, a manager requires that many people operate efficiently at different levels of status and responsibility. It takes neither genius nor heroism to be a manager, but rather persistence, toughmindedness, hard work, intelligence, analytical ability, and perhaps most important, tolerance and goodwill.

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The conception of leadership, however, attaches almost mystical beliefs to what a leader is and assumes that only great people are worthy of the drama of power and politics. Here leadership is a psychodrama in which a brilliant, lonely person must gain control of himself or herself as a precondition for controlling others. Such an expectation of leadership contrasts sharply with the mundane, practical, and yet important conception that leadership is really managing work that other people do. Three questions come to mind. Is the leadership mystique merely a holdover from our childhood-from a sense of dependency and a longing for good and heroic parents? Or is it true that no matter how competent managers are, their leadership stagnates because of their limitations in visualizing purposes and generating value in work? Driven by narrow purposes, without an imaginative capacity and the ability to communicate, do managers then perpetuate group conflicts instead of reforming them into broader desires and goats? If indeed problems demand greatness, then judging by past performance, the selection and development of leaders leave a great deal to chance. There are no known ways to train "great" leaders. Further, beyond what we leave to chance, there is a deeper issue in the relationship between the need for competent managers and the longing for great leaders.

What it takes to ensure a supply of people who will assume practical responsibility may inhibit the development of great leaders. On the other hand, the presence of great leaders may undermine the development of managers who typically become very anxious in the relative disorder that leaders seem to generate. It is easy enough to dismiss the dilemma of training managers, though we may need new leaders, or leaders at the expense of managers, by saying that the need is for people who can be both. But just as a managerial culture differs from the entrepreneurial culture that develops when leaders appear in organizations, managers and leaders are very different kinds of people. They differ in motivation, in personal history, and in how they think and act.

Attitudes Toward Goals

Managers tend to adopt impersonal, if not passive, attitudes toward goals. Managerial goals rise out of necessities rather than desires and, therefore, are deeply embedded in their organization's history and culture.

How leaders think about goals: they are active instead of reactive, shaping ideas instead of responding to them. Leaders adopt a personal and active attitude toward goals. The influence a leader exerts in altering moods, in evoking images and expectations, and in establishing specific desires and objectives determines the direction a business takes. The net result of this influence changes the way people think about what is desirable, possible, and necessary.

Conceptions of Work

Managers tend to view work as an enabling process involving some combination of people and ideas interacting to establish strategies and make decisions. They help the process along by calculating the interests in opposition, planning when controversial issues should surface, and reducing tensions. In this enabling process, managers' tactics appear flexible: on one hand, they negotiate and bargain; on the other, they use rewards, punishments, and other forms of coercion. To get

people to accept solutions to problems, managers continually need to coordinate and balance opposing views. Interestingly enough, this type of work has much in common with what diplomats and mediators do, with Henry Kissinger apparently an outstanding practitioner. Managers aim to shift balances of power toward solutions acceptable as compromises among conflicting values.

Leaders work in the opposite direction. Where managers act to limit choices, leaders develop fresh approaches to long-standing problems and open issues to new options. To be effective, leaders must project their ideas onto images that excite people and only then develop choices that give those images substance. John F. Kennedy's brief presidency shows both the strengths and weaknesses connected with the excitement leaders generate in their work. In his inaugural address he said, "Let every nation know, whether it wishes us well or ill, that we shall pay any price, bear any burden, meet any hardship, support any friend, oppose any foe, in order to assure the survival and the success of liberty." This much-quoted statement forced people to react beyond immediate concerns and to identify with Kennedy and with important shared ideals. On closer scrutiny, however, the statement is absurd because it promises a position, which, if adopted, as in the Vietnam War, could produce disastrous results. Yet, unless expectations are aroused and mobilized, with all the dangers of frustration inherent in heightened desire, new thinking and new choice can never come to light.

Leaders work from high-risk positions; indeed, they are often temperamentally disposed to seek out risk and danger, especially where the chance of opportunity and reward appears promising. From psychoanalysis point of view, the reason one individual seeks risks while another approaches problems conservatively depends more on his or her personality and less on conscious choice. For those who become managers, a survival instinct dominates the need for risk, and with that instinct comes an ability to tolerate mundane, practical work. Leaders sometimes react to mundane work as to an affliction.

Relations with Others

Managers prefer to work with people; they avoid solitary activity because it makes them anxious. The need to seek out others with whom to work and collaborate seems to stand out as an important characteristic of managers. When asked, for example, to write imaginative stories in response to a picture showing a single figure (a boy contemplating a violin or a man silhouetted in a state of reflection), managers populated their stories with people. The following is an example of a manager's imaginative story about the young boy contemplating a violin: "Mom and Dad insisted that their son take music lessons so that someday he can become a concert musician. His instrument was ordered and had just arrived. The boy is weighing the alternatives of playing football with the other kids or playing with the squeak box. He can't understand how his parents could think a violin is better than a touchdown. After four months of practicing the violin, the boy has had more than enough. Dad is going out of his mind, and Mom is willing to give in reluctantly to their wishes. Football season is now over, but a good third baseman will take the field next spring."

This story illustrates two themes that clarify managerial attitudes toward human relations. The first is to seek out activity with other people (that

is, the football team), and the second is to maintain a low level of emotional involvement in those relationships. Low emotional involvement appears in the writer's use of conventional metaphors, even clichés, and in the depiction of the ready transformation of potential conflict into harmonious decisions. In this case, the boy, Mom, and Dad agree to give up the violin for sports.

These two themes may seem paradoxical, but their coexistence supports what a manager does, including reconciling differences, seeking compromises, and establishing a balance of power. The story further demonstrates that managers may lack empathy or the capacity to sense intuitively the thoughts and feelings of those around him.

Consider another story written to the same stimulus picture by someone thought of as a leader by his peers: "This little boy has the appearance of being a sincere artist, one who is deeply affected by the violin, and has an intense desire to master

the instrument. He seems to have just completed his normal practice session and appears to be somewhat crestfallen at his inability to produce the sounds that he is sure lie within the violin. He appears to be in the process of making a vow to himself to expend the necessary time and effort to play this instrument until he satisfies himself that he is able to bring forth the qualities of music that he feels within himself. With this type of determination and carry-through, this boy became one of the great violinists of his day."

Empathy is not simply a matter of paying attention to other people. It is also the capacity to take in emotional signals and make them meaningful in a relationship. People who describe another person as "deeply affected," with "intense desire," "crestfallen," and as one who can "vow to himself" would seem to have an inner perceptiveness that they can use in their relationships with others. Managers relate to people according to the role they play in a sequence of events or in a decision-making process, while leaders, who are concerned with ideas, relate in more intuitive and empathetic ways. The distinction is simply between a manager's attention to how things get done and a leader's to what the events and decisions mean to participants.

In recent years, managers have adopted from game theory the notion that decision-making events can be one of two types; the win-lose situation (or zero-sum game) or the win-win situation in which everybody in the action comes out ahead. Managers strive to convert win-lose into win-win situations as part of the process of reconciling differences among people and maintaining balances of power.

As an illustration, take the decision of how to allocate capital resources among operating divisions in a large, decentralized organization. On the surface, the dollars available for distribution are limited at any given time. Presumably, therefore, the more one division gets, the less

is available for other divisions. Managers tend to view this situation (as it affects human relations) as a conversion issue: how to make what seems like a win-lose problem into a win-win problem. From that perspective, several solutions come to mind. First, the manager focuses others' attention on procedure and not on substance. Here the players become engrossed in the bigger problem of how to make decisions, not what decisions to make. Once committed to the bigger problem, these people have to support the outcome since they were involved in formulating the decision-making rules. Because they believe in the rules they formulated, they will accept present losses, believing that next time they will win.

Second, the manager communicates to subordinates indirectly, using "signals" instead of "messages." A signal holds a number of implicit positions, while a message clearly states a position. Signals are inconclusive and subject to reinterpretation should people become upset and angry; messages involve the direct consequence that some people will indeed not like what they hear. The nature of messages heightens emotional response and makes managers anxious. With signals, the question of who wins and who loses often becomes obscured.

Third, the manager plays for time. Managers seem to recognize that with the passage of time and the delay of major decisions, compromises emerge that take the sting out of win-lose situations, and the original "game" will be superseded by additional situations. Compromises mean that one may win and lose simultaneously, depending on which of the games one evaluates. There are undoubtedly many other tactical moves managers use to change human situations from win-lose to win-win. But the point is that such tactics focus on the decision-making process itself, and that process interests managers rather than leaders. Tactical interests involve costs as well as benefits; they make organizations fatter in bureaucratic and political intrigue and leaner in direct, hard activity and warm human relationships. Consequently, one often hears subordinates characterize managers as inscrutable, detached, and manipulative. These adjectives arise from the subordinates' perception that they are linked together in a process whose purpose is to maintain a controlled as well as rational and equitable structure.

In contrast, one often hears leaders referred to with adjectives rich in emotional content. Leaders attract strong feelings of identity and difference or of love and hate. Human relations in leader-dominated structures often appear turbulent, intense, and at times even disorganized. Such an atmosphere intensifies individual motivation and often produces unanticipated outcomes.

Senses of Self

In The Varieties of Religious Experience, William James describes two basic personality types, "once-born" and "twice-born." People of the former personality type are those for whom adjustments to life have been straightforward and whose lives have been more or less a peaceful flow since birth. Twice-borns, on the other hand, have not had an easy time of it. Their lives are marked by a continual struggle to attain some sense of order. Unlike once-borns, they cannot take things for granted. According to James, these personalities have equally different worldviews. For a once-born personality, the sense of self as a guide to conduct and attitude derives from a feeling of being at home and in harmony with one's environment. For a twice-

born, the sense of self derives from a feeling of profound separateness. A sense of belonging or of being separate has a practical significance for the kinds of investments managers and leaders make in their careers.

Managers see themselves as conservators and regulators of an existing order of affairs with which they personally identify and from which they gain rewards. A manager's sense of self-worth is enhanced by perpetuating and strengthening existing institutions: He or she is performing in a role that is in harmony with the ideals of duty and responsibility. William James had this harmony in mind-this sense of self as flowing easily to and from the outer world - in defining a once-born personality.

Leaders tend to be twice-born personalities, people who feel separate from their environment. They may work in organizations, but they never belong to them. Their sense of who they are does not depend on memberships, work roles, or other social indicators of identity. And that perception of identity may form the theoretical basis for explaining why certain individuals seek opportunities for change. The methods to bring about change may be technological, political, or ideological, but the object is the same: to profoundly alter human, economic, and political relationships.

In considering the development of leadership, we have to examine two different courses of life history: (l) development through socialization, which prepares the individual to guide institutions and to maintain the existing balance of social relations; and (2) development through personal mastery, which impels an individual to struggle for psychological and social change. Society produces its managerial talent through the first line of development; leaders emerge through the second.

Development of Leadership

Every person's development begins with family. Each person experiences the traumas associated with separating from his or her parents, as well as the pain that follows such a wrench. In the same vein, all individuals face the difficulties of achieving self-regulation and self-control. But for some, perhaps a majority, the fortunes of childhood provides adequate gratification and sufficient opportunities to find substitutes for rewards no longer available. Such individuals, the "once-borns," make moderate identifications with parents and find a harmony between what they expect and what they are able to realize from life.

But suppose the pains of separation are amplified by a combination of parental demands and individual needs to the degree that a sense of isolation, of being special, or of wariness disrupts the bonds that attach children to parents and other authority figures? Given a special aptitude under such conditions, the person becomes deeply involved in his or her inner world at the expense of interest in the outer world. For such a person, self-esteem no longer depends solely on positive attachments and real rewards. A form of self-reliance takes hold along with expectations of performance and achievement, and perhaps even the desire to do great works. Such self-perceptions can come to nothing if the individual's talents are negligible. Even with strong talents, there are no guarantees that achievement will follow, let alone that the end result will be for good rather than evil.

Other factors enter into development as well. For one, leaders are like artists and other gifted people who often struggle with neuroses; their ability to function varies considerably even over

the short run, and some potential leaders lose the struggle altogether. Also, beyond early childhood, the development patterns that affect managers and leaders involve the selective influence of particular people. Managerial personalities form moderate and widely distributed attachments. Leaders, on the other hand, establish, and also break off, intensive one-to-one relationships. It is a common observation that people with great talents are often indifferent students. No one, for example, could have predicted Einstein's great achievements on the basis of his mediocre record in school. The reason for mediocrity is obviously not the absence of ability. It may result, instead, from self-absorption and the inability to pay attention to the ordinary tasks at hand. The only surefire way that an individual can interrupt reverie-like preoccupation and self-absorption is to form a deep attachment to a great teacher or other person who understands and has the ability to communicate with the gifted individual. Whether gifted individuals find what they need in one-to-one relationships depends on the availability of teachers, possibly parental surrogates, whose strengths lie in cultivating talent. Fortunately, when generations meet and the self-selections occur, we learn more about how to develop leaders and how talented people of different generations influence each other.

While apparently destined for mediocre careers, people who form important one-to-one apprenticeship relationships often are able to accelerate and intensify their development. The psychological readiness of an individual to benefit from such a relationship depends on some experience in life that forces that person to turn inward.

Consider Dwight Eisenhower, whose early career in the army foreshadowed very little about his future development. During World War I, while some of his West Point classmates were already experiencing the war firsthand in France, Eisenhower felt "embedded in the monotony and unsought safety of the Zone of the Interior...that was intolerable punishment."

Shortly after World War I, Eisenhower, then a young officer somewhat pessimistic about his career chances, asked for a transfer to Panama to work under General Fox Connor, a senior officer whom he admired. The army turned down his request. This setback was very much on Eisenhower's mind when Ikey, his first born son, succumbed to influenza. Through some sense of responsibility for its own, the army then transferred Eisenhower to Panama, where he took up his duties under General Connor with the shadow of his lost son very much upon him. In a relationship with the kind of father he would have wanted to be, Eisenhower reverted to being the son he had lost. And in this highly charged situation, he began to learn from his teacher. General Connor offered, and Eisenhower gladly took, a magnificent tutorial on the military. The effects of this relationship on Eisenhower cannot be measured quantitatively, but in examining his career path from that point, one cannot overestimate its significance. As Eisenhower wrote later about Connor, "Life with General Connor was a sort of graduate school in military affairs and the humanities, leavened by a man who was experienced in his knowledge of men and their conduct. I can never adequately express my gratitude to this one gentleman.... In a lifetime of association with great and good men, he is the one more or less invisible figure to whom I owe an incalculable debt."

Managers embrace process, seek stability and control, and instinctively try to resolve problems quickly-sometimes before they fully understand a problem's significance.

Leaders, in contrast, tolerate chaos and lack of structure and are willing to delay closure in order to understand the issues more fully.

Some time after his tour of duty with General Connor, Eisenhower's breakthrough occurred. He received orders to attend the Command and General Staff School at Fort Leavenworth, one of the most competitive schools in the army. It was a coveted appointment, and Eisenhower took advantage of the opportunity. Unlike his performance in high school and at West Point, his work at the Command School was excellent; he graduated first in his class.

Psychological biographies of gifted people repeatedly demonstrate the important part a teacher plays in developing an individual. Andrew Carnegie owed much to his senior, Thomas A. Scott. As head of the Western Division of the Pennsylvania Railroad, Scott recognized talent and the desire to learn in the young telegrapher assigned to him. By giving Carnegie increased responsibility and by providing him with the opportunity to learn through close personal observation, Scott added to Carnegie's self-confidence and sense of achievement. Because of his own personal strength and achievement, Scott did not fear Carnegie's aggressiveness. Instead, he gave it full play in encouraging Carnegie's initiative. Great teachers take risks. They bet initially on talent they perceive in younger people. And they risk emotional involvement in working closely with their juniors. The risks do not always pay off, but the willingness to take them appears to be absolutely crucial in developing leaders.

Can Organizations Develop Leaders?

A myth about how people learn and develop that seems to have taken hold in American culture also dominates thinking in business. The myth is that people learn best from their peers. Supposedly, the threat of evaluation and even humiliation recedes in peer relations because of the tendency for mutual identification and the social restraints on authoritarian behavior among equals. Peer training in organizations occurs in various forms. The use, for example, of task forces made up of peers from several interested occupational groups (sales, production, research, finance) supposedly removes the restraints of authority on the individual's willingness to assert and exchange ideas. As a result, so the theory goes, people interact more freely, listen more objectively to criticism and other points of view, and, finally, learn from this healthy interchange.

Another application of peer training exists in some large corporations, where organizational structure is built on the principle of joint responsibility of two peers, one representing the commercial end of the business and the other the technical. Formally, both hold equal responsibility for geographic operations or product groups, as the case may be. As a practical matter, it may tum out that one or the other of the peers dominates the management. Nevertheless, the main interaction is between two or more equals. The principal question about such arrangements is whether they perpetuate the managerial orientation and preclude the formation of one-to-one relationships between senior people and potential leaders.

Aware of the possible stifling effects of peer relationships on aggressiveness and individual initiative, another company utilizes joint responsibility of peers for operating units, with one important difference. The chief executive of

this company encourages competition and rivalry among peers, ultimately rewarding the one who comes out on top with increased responsibility. These hybrid arrangements produce some unintended consequences that can be disastrous.

There is no easy way to limit rivalry. Instead, it permeates all levels of the operation and opens the way for the formation of cliques in an atmosphere of intrigue. One large, integrated oil company has accepted the importance of developing leaders through the direct influence of senior on junior executives. The chairman and chief executive officer regularly selects one talented university graduate whom he appoints as his special assistant and with whom he will work closely for a year. At the end of the year, the junior executive becomes available for assignment to one of the operating divisions, where he or she will be assigned to a responsible post rather than a training position. This apprenticeship acquaints the junior executive firsthand with the use of power and with the important antidotes to the power disease called hubris – performance and integrity.

Working in one-to-one relationships, where there is a formal and recognized difference in the power of the players, takes a great deal of tolerance for emotional interchange. This interchange, inevitable in close working arrangements, probably accounts for the reluctance of many executives to become involved in such relationships. Fortune carried an interesting story on the departure of a key executive, John W. Hanley, from the top management of Procter & Gamble to the chief executive officer position at Monsanto. According to this account, the chief executive and chairman of P&G passed over Hanley for appointment to the presidency, instead naming another executive vice president to this post. The chairman evidently felt he could not work well with Hanley who, by his own acknowledgment, was aggressive, eager to experiment and change practices, and constantly challenged his superior.

A CEO naturally has the right to select people with whom he feels congenial. But I wonder whether a greater capacity on the part of senior officers to tolerate the competitive impulses and behavior of their subordinates might not be healthy for corporations. At least a greater tolerance for interchange would not favor the managerial team player at the expense of the individual who might become a leader.

I am constantly surprised at the frequency with which chief executives feel threatened by open challenges to their ideas, as though the source of their authority, rather than their specific ideas, was at issue. In one case, a chief executive officer, who was troubled by the aggressiveness and sometimes outright rudeness of one of his talented vice presidents, used various indirect methods such as group meetings and hints from outside directors to avoid dealing with his subordinate. He was advised to deal head-on with what irritated him. It was suggested that by direct, face-to-face confrontation, both he and his subordinate would learn to validate the distinction between the authority to be preserved and the issues to be debated. The ability to confront is also the ability to tolerate aggressive interchange. And that skill not only has the net effect of stripping away the veils of ambiguity and signaling so characteristic of managerial cultures but also encourages the emotional relationships leaders need if they are to survive.

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If a fire does occur, it is imperative that you know how to face it. Fire drills ensure everyone knows what to do when there is a fire. Training and drills should emphasize the importance of a rapid response team proceeding directly to the scene of a reported smoke/ fire with fire extinguishers and without stopping to dress in firefighting gear.

CAPTAIN ANESTIS ANESTIS

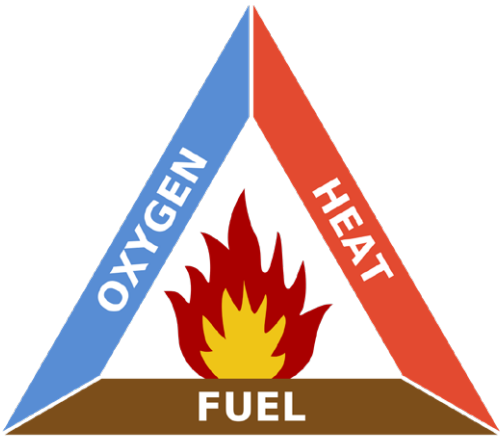
FIRE ON BOARD; Face the challenge.

Fire on a ship is one of the most dangerous incidents which can happen on board. In the event of fire, persons ashore often have available the immediate assistance of well-trained firefighting professionals. Mariners usually are alone aboard ship, and when fires occur at sea they must remain onboard and cope with these incidents to the best of their own abilities. These efforts, often because of lack of knowledge, training, and experience, have produced less than satisfactory results and at times have resulted in tragedy.

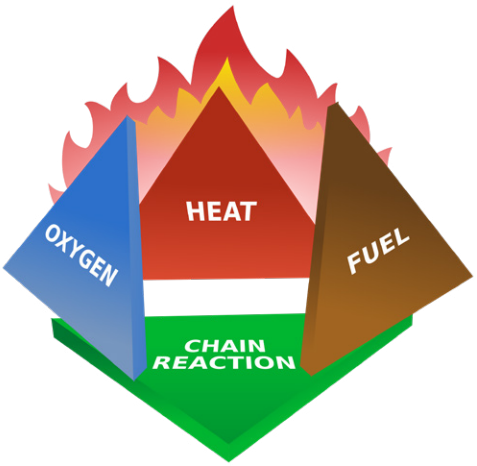
Few words strike fear into a ship's crew than "Fire on Board!". But how the fire is caused? The fire triangles or combustion triangles or "fire diamond" are simple models for understanding the necessary ingredients for most fires[1]. The triangle illustrates the three elements a fire needs to ignite: heat, fuel, and an oxidizing agent (usually oxygen). A fire naturally occurs when the elements are present and combined in the right mixture, meaning that fire is actually an event rather than a thing. A fire can be prevented or extinguished by removing any one of the elements in the fire triangle.

The fire tetrahedron represents the addition of a component in the chemical chain reaction, to the three already present in the fire triangle. Once a fire has started, the resulting exothermic chain reaction sustains the fire and allows it to continue until or unless at least one of the elements of the fire is blocked.

1 https://en.wikipedia.org/wiki/Fire_triangle



The fire triangle



The fire tetrahedron

Combustion is the chemical reaction that feeds a fire more heat and allows it to continue. When the fire involves burning metals like lithium, magnesium, titanium, etc., it becomes even more important to consider the energy release.

In general, fires may be extinguished by removing one side of the fire triangle (fuel, heat, or oxygen) or by slowing down the rate of combustion. More specific:

a. Removing Fuel. Although it is not usually possible to remove the fuel to extinguish a fire, there may be circumstances in which it is possible. If part of the fuel that is near or actually on fire can safely be jettisoned over the side, do so as soon as possible. Also in the case of liquid fuel fires caused by leaking pipes or fittings, the fuel supply should be closed.

b. Removing Heat. The fire will go out if you can remove enough heat by cooling the fuel to below temperature at which it will support combustion. Heat may be transferred in three ways: by radiation, by conduction and by convection. In the process known as radiation, heat is radiated through the air in all directions. Radiated heat is what causes you to feel hot when you stand near an open fire. In conduction, heat is transferred through a substance or from one substance to another by direct contact from molecule to molecule. Therefore, a thick steel bulkhead with a fire on one side can conduct heat

from the fire and transfer the heat to the adjoining compartments. In convection, the air and gases rising from a fire are heated. These gases can then transfer the heat to other combustible materials that are within reach. Heat transferred by convection is a particular danger in ventilation systems. These systems may carry the heated gases from the fire to another location several compartments away. If there are combustibles with a low flash point within a compartment served by the same ventilation system, a new fire may start. To eliminate the heat side of the fire triangle, cool the fire by applying something that will absorb the heat.

c. Controlling Oxygen: Oxygen is the third component of the fire triangle. Oxygen is difficult to control because you obviously cannot remove the oxygen from the atmosphere that normally surrounds a fire. However, oxygen can be diluted or displaced by other substances that are noncombustible. For example, if a fire occurs in a closed space, it can be extinguished by diluting the air with carbon dioxide (C02) gas. This dilution must proceed to a certain point before the flames are extinguished. The point at which the dilution is enough to extinguish the fire can be reached faster if you quickly secure all ventilation systems to the space.

Fires may be extinguished by removing one side of the fire triangle (fuel, heat, or oxygen) or by slowing down the rate of combustion.

d. Reducing the rate of Combustion: Dry chemical fire extinguishing agents do not extinguish fires by cooling or smothering. Instead, they are believed to interrupt the chemical reaction of the fuel and oxygen. This action reduces the rate of combustion, and the fire is extinguished quickly. Speed is very important in firefighting. If you allow a fire to burn without confining or extinguishing it, the fire can spread rapidly. A small fire in a trash can may spread to other combustibles and become a large fire that could affect several compartments or even the whole ship.

The method or methods used in any specific instance will depend upon the classification of the fire and the circumstances surrounding the fire[2]. There are six classes of fire, Class A, Class B, Class C, Class D, “Electrical” and Class F:[3]

a. Class A fires – Ordinary combustible materials: These are fires involving flammable solids, e.g. wood, cloth, rubber, paper, and some types of plastics. Class A fires are probably the easiest to extinguish as spraying them with water will cool the fire, removing the heat supply which is essential for the fire to burn. Water is the best extinguishing medium for Class A fires. Some Dry Chemical Powder (DCP) extinguishers are also used.

b. Class B fires – Flammable liquids: These are fires involving flammable liquids or liquefiable solids, e.g. petrol, oil, paint and also some waxes & plastics, but not cooking fats or oils. Fires involving these give off a lot of heat and tend to spread very quickly. They also produce thick, black toxic smoke, which can make these fires difficult to fight. The best approach for extinguishing a Class B fire is to use a foam fire extinguisher to smother the

2 In accordance with European Committee for Standardization. In USA and other countries there is a differential in the classification of fires.
3 https://en.wikipedia.org/wiki/Fire_class

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flames, as using water causes the fuel to scatter therefore spreading out the fire.

c. Class C fires – Flammable gases: Fires involving flammable gases or liquefied gases (like hydrogen, butane, methane, oxygen, acetylene etc.) are one of the most dangerous types of fire to fight. Before attempting to put the fire out, you should make sure that the gas supply is isolated first. Dry Chemical Powder is widely used for extinguishing gaseous fires. Its ability to cut the chain reaction in the combustion process makes it suitable for the purpose.

d. Class D fires – Combustible metals: Certain metals can burn if ignited, although it requires a lot of heat to ignite most metals, as they are good conductors and transfer heat away quickly to their surroundings. Water should not be used on Class D fires. It may add to the intensity and cause the molten metal to splatter. This, in turn, can extend the fire and inflict serious burns on those nearby. If a metal fire is spotted early on, specialist type D powder fire extinguishers can be effective, although it should be ensured that they are the specific dry powder type, suitable for use on metal fires.

e. Electrical fires (not classified, formerly Class E) - Electrical equipment: There is no “official” Class for electrical fires. Electricity is not a fuel; it does not burn like a fuel. However, it is a dangerous complication at a fire, because it is a source of heat and potential electric shock. Overloaded circuits, overloaded switchboards, overheating motors, faulty electrical equipment, damaged wiring etc., can all cause electrical fires. Before dealing with an electrical fire, the supply of electricity must be isolated as quickly as possible. As water and foam has the power to conduct electricity you should not attempt to put out the fire by putting water on the flames or by using foam and water based extinguishers. Carbon dioxide and dry powder fire extinguishers are the only types of fire extinguishers recommended for safely tackling electrical fires. By turning the electrical source off, the fire can be fought by one of the other class of fire extinguishers.

f. Class F fires – Cooking oils: Class F fires are fires which involve cooking oil or fat. Though technically a sub-class of fires caused by flammable liquids or gases, they differ from conventional fires due to the extremely high temperatures involved. Never throw water over a Class F fire as this causes it to explode, spreading the fire and risking lives. When the fire is small, you might be able to use a fire blanket to put it out. Placing one over a fire in its early stages will smother it of oxygen and prevent a bigger fire. If that isn’t possible, then the only other safe way of extinguishing the fire is a wet chemical extinguisher. Wet chemical extinguishers contain a formula which cools the fire and then emulsifies to seal the surface and prevent re-ignition.

If a fire does occur, it is imperative that you know how to face it. Fire drills ensure everyone knows what to do when there is a fire. Training and drills should emphasize the importance of a rapid response team proceeding directly to the scene of a reported smoke/fire with fire extinguishers and without stopping to dress in firefighting gear. Training should also emphasize the importance of adopting a defensive firefighting posture after the initial response – the paramount requirement being rapid establishment of containment boundaries on all sides of the fire, e.g. by means of a deluge system. Crew required under regulations and flag state requirements, to conduct regular exercises to demonstrate an ability to deal with emergencies quickly and efficiently. Whatever way you decide to carry out fire drills on the yacht, you must do them regularly. Tips for good fire drills are as follows:

1. Before carrying out the drill it is often useful to inform all crewmembers of that a fire drill is going to happen, providing them with specific details.
2. Start with the alarm you normally use to get crew to the muster stations. This allows an immediate check to confirm everyone is accounted for and doing their duty.
3. Occur in different locations on the vessel where a fire could possibly start.
4. Have a sense of urgency.
5. Time crew during the drill to see how long it takes them to do certain tasks.
6. Make sure crew use the correct firefighting equipment at the scene.
7. Check that your fire hoses are long enough and in good condition.
8. Make sure crew know how to use all the different types of extinguishers, hose spray/jet nozzles and pumps on the vessel.
9. Make sure crew is familiar with the location of the emergency escape routes.
10. Pay attention to any difficulties experienced as a result of the chosen escape routes, such as doors being difficult to open or exits being blocked.
11. Make sure there is a way to stop the drill if a crew member is feeling uncomfortable.
12. Always debrief after a fire drill. This can be an informal discussion afterwards where “what if”

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scenarios, as well as deficiencies in the day's exercise, can be discussed. Make sure everyone understands that it's better to make a mistake in a drill than in a real emergency.

13. Always question crew on their knowledge but also listen to their comments and suggestions. Crew members should not be afraid to make comment or ask questions.
14. Make sure the records are kept and made while things are still fresh in your mind.

The best way to deal with fires on board ships is to prevent them rather than letting them occur. Some of the major causes of yacht fires are: fuel leaks in the engine compartment, overheating and ignition of cooking fat/grease in the galley, careless smoking, faulty or overloaded electrical wires/ devices - electronic circuits/equipment, using of naked flames near flammable liquids/materials and overloaded laundry dryers.

But how to deal with a fire if one does break out and especially when the yacht is at sea? Some important steps are following:

1. Raise the alarm and make an emergency call to the Coast Guard over VHF Channel 16 or by cell phone (or satellite phone).
2. If possible, position the boat so that the fire is downwind.
3. Inform all guests/ passengers and move them away from the fire.
4. Make sure everyone puts on life jackets in case that you're forced to abandon ship.
5. Attempt to put out the fire. Quickly determine the class of fire, the appropriate equipment, and the extinguishing agent (use a hose, extinguisher, fire blanket etc.). If it is available using breathing apparatus. In order to increase the safety it is important, when working with breathing apparatus, to act and work according to predefined and well trained procedures. If you can't extinguish the fire, get out of the area.
6. If a burning object can be safely moved, get it over the side quickly.
7. Stop the oxygen supply to the fire. If you can't extinguish the fire, you must act quickly to close the compartment (turn off all ventilation fans to the compartments and close all the hatches and doors). Your goal is stop all air getting to the fire so the oxygen supply will run out.
8. Stop the fuel supply to fire. Especially if there is a fire in the engine room, you might need to isolate the fuel supply. This decision must be made only by the Master because it will have an impact on vessel maneuverability, speed, power and firefighting and pumping capabilities.
9. Activate fixed firefighting systems. Before you operate the system make sure all ventilation is stopped and all openings are closed and shut down as much machinery as possible. But most important is to ensure that everyone is out of the compartment.
10. Prevent spread of fire. You must monitor heat in surrounding compartments and, if they are hot, start boundary cooling. Use water sparingly and monitor flooding from boundary cooling water and activate pumps accordingly.
11. Don't re-enter the compartment too soon. Allow it to cool down and keep monitoring the temperature of the surrounding bulkheads and the deck above. Wait twice as long as you think is necessary and when you decide to enter through the door or hatch stay clear of the opening in case the rush of air re-ignites the fire.
12. Maintain a watch on the area once the fire has been extinguished to monitor any re-flashes.
13. If you cannot get the fire under control quickly, be prepared to abandon ship.

Finally, except for the reasons mentioned above, which can cause fire to a vessel, there is another case which is very difficult to deal with. Potential fire situations must include the case in which a fire would be a result of terrorism, piracy or other kind of criminal act (e.g. after an armed robbery in order to conceal their traces/ fingerprints etc.). Especially for terrorists fire is an attractive weapon for several reasons. Igniting a fire requires little to no training. Fire and associated smoke can penetrate defenses with alarming lethality and makes crew's response more difficult. The images of fire also increase media coverage, capturing world attention.

During a fire, as in other disasters, crews may experience a panic incident. The more so when this fire is a result of terrorism or piracy. Yacht crewmembers must rethink the way that they prepare their firefighting actions and anticipate the use of fire as a weapon, especially when combined with other attack methods. Efficient tackling of these situations can be achieved by continuous training and by practical drills onboard vessel.

CONCLUSION

Fire safety is particularly crucial for a yacht. Although a yacht's fire is not common, if it happens the situation can get very bad, very quickly. In most cases a fire starts as a small smoldering fire and after an incipient phase it will start to grow. When it starts to grow it usually grows very quickly. Crew training and quick reaction to fire are the most important safety precautionary measures in order to stop fire at first stage. A full understanding of fire as a weapon and associated implications for proper response are essential for a yacht's security, as it requires specific preplanned actions in order to address this specific threat. And bear in mind one very important thing: you must be ready for a fight fire at all times!

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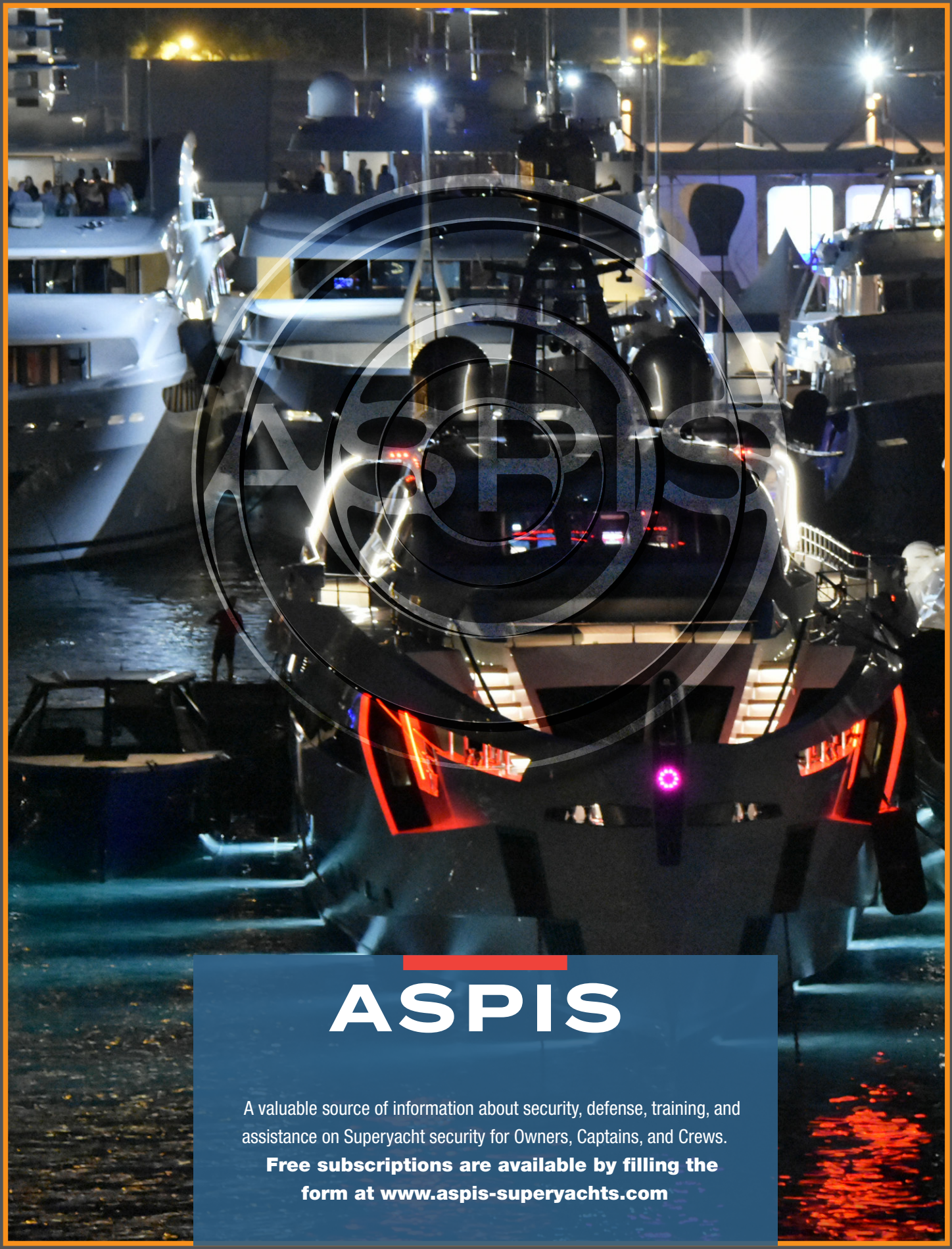

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