

Annual Meeting presentation 21st October 2023
CASSOA Fire Safety on Storage Sites – a changing risk
for CASSOA members



Who are Packattack?

- Tony McGuirk CBE - joined fire service in 1976 -Served Greater Manchester, Buckinghamshire, Essex. Chief Fire Officer Merseyside Fire & Rescue Service for 10 years. 2015 relocated to Australia - 3 years at NSW EPA Head of crisis and disaster response.
- Regulatory and responder experience fire and environment perspective
- Packattack established in 2019, in partnership with friend and colleague – Gary Taylor – 30 years firefighting and fire leadership.
- Senior instructor, experienced fire leader and specialist in firefighting innovation and fire engineering

So, what's the problem for CASSOA members ?

- Site storage owners face 2 major challenges that have converged now.
- Fire Safety regulations have changed and require site owners to be more active in fire risk management
- The emergence of batteries as a major fire risk is not reflected in existing fire safety guidance which is based on triangle of fire thinking – remove any part of the triangle and there is no fire. This assumption is flawed due to the self ignition properties of lithium-ion batteries
- Many mobile homes now use solar panels and batteries as primary energy source, and may keep these systems live during storage
- Lithium ion fires burn hotter, have directional flames and are more likely to spread from vehicle to vehicle in proximity.
- **Firefighters are concerned**



Firefighters are extremely worried about lithium-ion batteries

FBU Conference decision states “the significant acceleration to provide alternative energy solutions which comes at an increased risk, specifically regarding the risk lithium-ion batteries pose to firefighters. The penetration of these devices into all levels of our society has far outstripped our knowledge of the risks and hazards associated with lithium-ion batteries”.



RECORD OF DECISIONS 2023

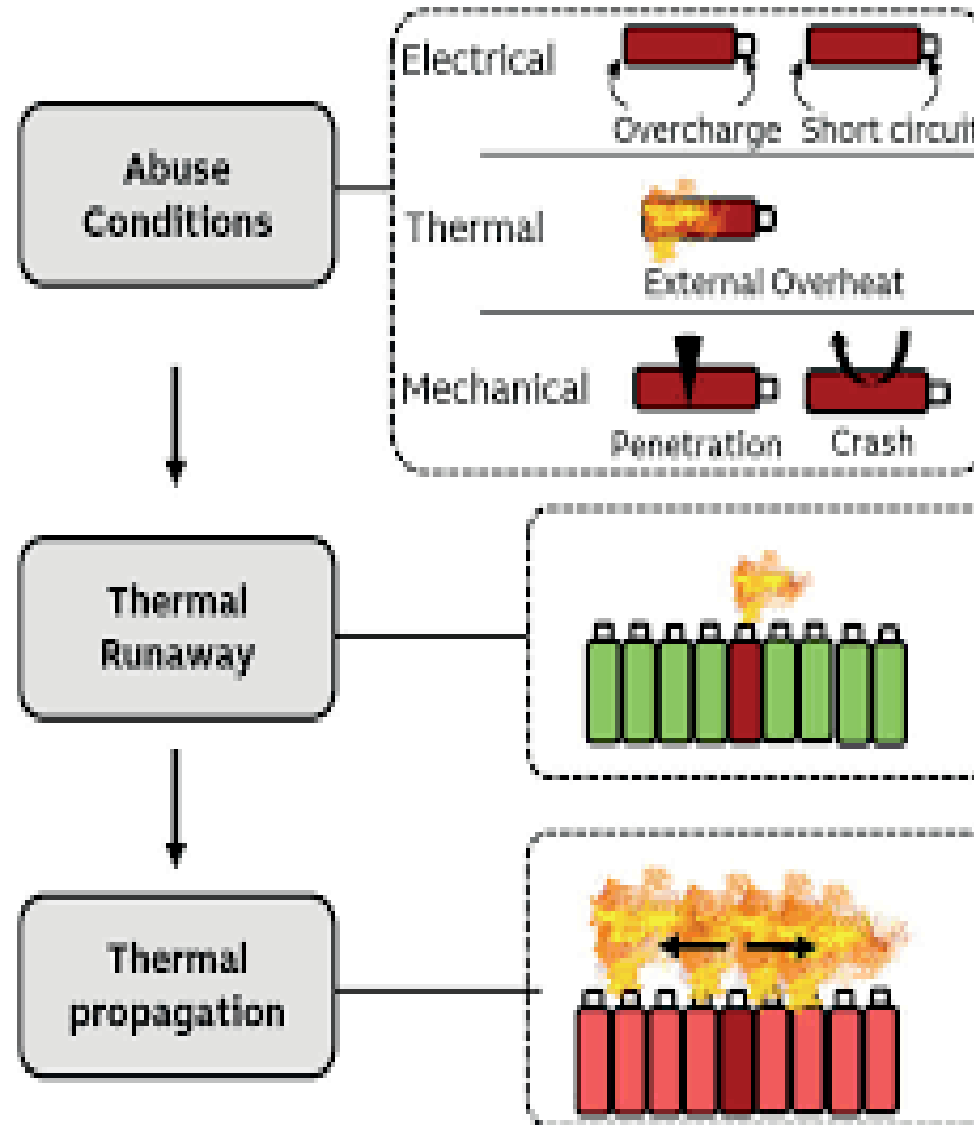
Fire Brigades Union
94th Conference, Blackpool
10th, 11th and 12th May 2023

Understanding the problem of thermal runaway

Lithium batteries contain thousands of individual cells. Ignition of a thermal runaway starts when a single cell fails through poor manufacture, abuse or damage - which means self-ignition can occur at random – **no other ignition source is required.**

Temperature increases rapidly through heat transfer between cells – which means **no additional fuel is required**

Thermal propagation rapidly takes place and thermal stability is lost due to self-generation of heat – the battery “explodes” – **this process does not need an ignition source**



- Lithium battery fires are:
 - self igniting (often at random)
 - self sustaining
 - susceptible to re-ignition
- They are becoming a necessity in site infrastructure of both **the vehicle and on sites/in storage**
- All current regulations and guidance pre-date the lithium fire risk, and therefore are not contemporary with this emerging risk and threat

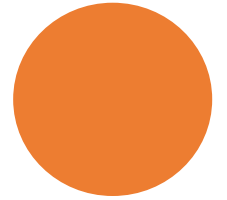
Lithium- ion batteries – what's the problem?

- **Lithium batteries are ubiquitous in society, and the mobile home industry – including on storage sites.**
- The sheer volume of batteries in the community, means the risk of failure and thermal runaway increases in both frequency and likelihood.
- **Lithium battery fires occur at random, with no warning, and escalate very quickly – this phenomena is becoming high profile.**
- There is **no training programme in place** to raise awareness of the dangers, and the signs & symptoms of thermal runaway for the public or the industry.
- There is a **culture of DIY in the caravan community**, - which creates a risk of incorrectly and unsafely installed lithium battery systems.



So how likely is a cell failure in reality?

- Fires in the industry are rare and so are thermal runaway fires – but the risk is real and increasing.
- Estimated 1 in 40 million chance of a cell failing - good odds? **Tesla battery pack contains over 7 million cells.** Many battery packs for **e-scooters** comprise **18650** and **21700** cells.
- So, although risks may look low, the sheer volume of batteries means that some fires are inevitable- and when they do occur, **they bring additional dangers to conventional fires**



Lithium battery fires on sites and in storage can occur in parked vehicles, golf carts/buggies, e-scooters and other mobility vehicles- these fires are different to conventional fires and have additional dangers.

Conventional vehicle fires are already high risk

→
ADDITIONAL DANGERS

Lithium battery fires on sites bring additional dangers and risks

Smoke

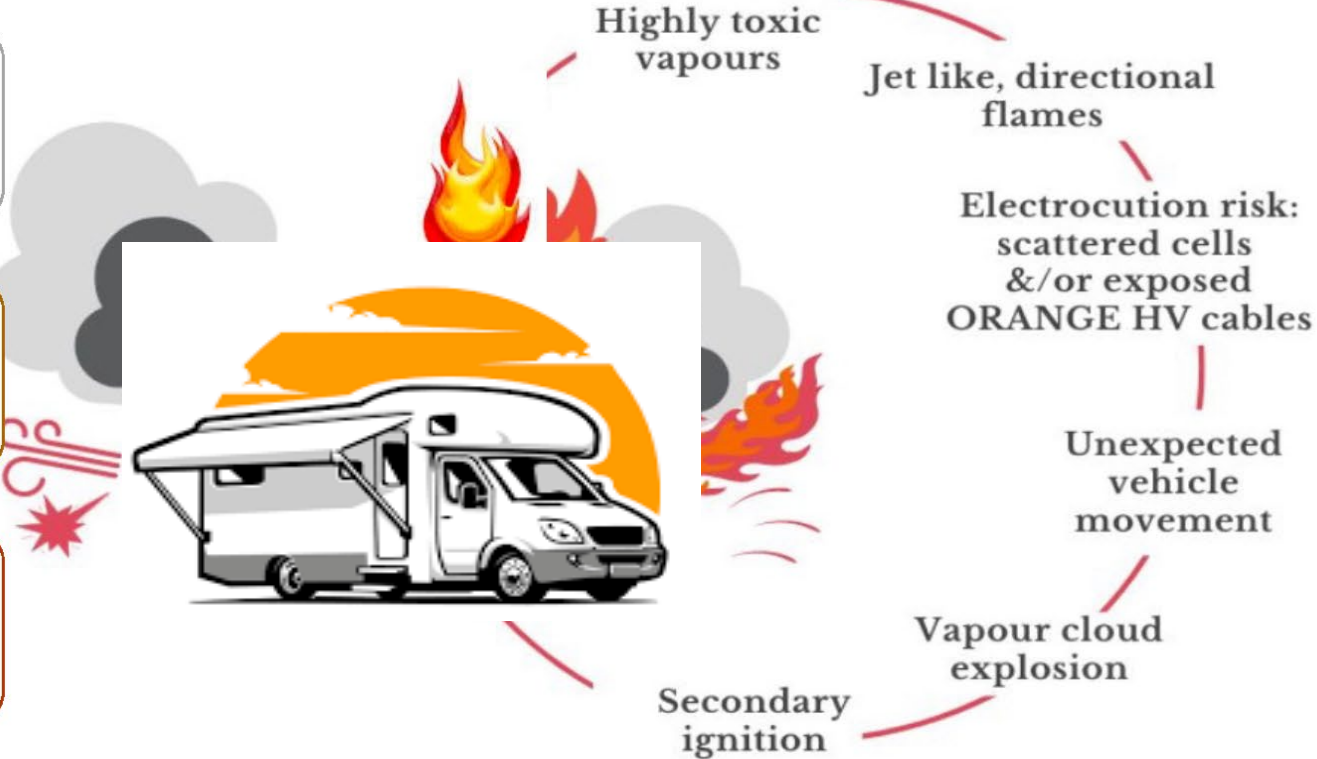
- Toxic smoke and vapour
- Disruptive

Environment

- Water run off
- Environmental impact

Public confidence

- Highly visible





The Good news - the problem can be managed

- CASSOA need to support members to manage this emerging risk through common sense, consistency and collaboration
- Based on our wide experience – Packattack have developed a very simple system to approach the problem – discussed with Fires committee
- The approach developed is called **Zero2five20 - the trademark and brand name of an approach to fire risk management that can be applied to any site and any industry**
- The approach has been developed by senior fire officers with many years operational experience. It is a fire management system distilled down to 4 simple actions with very clear objectives.

4 steps to success

zero2five20[®]
the fire safety success formula

- **Action 1** - aim4zero- the organisation seeks to achieve zero fires through a clear, effective, and pragmatic fire prevention approach.
- **Action 2**- detect in 2 minutes - systems and technology must be in place, and staff are trained to enable detection of a fire or excessive heat source within 2 minutes. This is vital given the propensity of lithium batteries in our society. On most sites CCTV is vital to meeting this aim.
- **Action 3** – There is a clear understanding of the method of calling 999, and the site has ensured the local Fire and Rescue Service have up to date information about the site.
- **Action 4**- think beyond the first five minutes and plan for first 20 minutes of the fire – liaise with the local FRS to understand how you can support an effective handover. Think about the information available to responding crews and consider the use of a Site Incident Management Point (SIMPoint) as a focus point for ensuring the FRS have accurate and up to date information.



Specific steps recommended for CASSOA

- ✓ **CASSOA Fire Safety Guidance to be amended and CASSOA officers will liaise with SECOM (security consultancy provider) to discuss this matter with them**
- ✓ **Enhanced training and awareness.**
- ✓ **Additional “goodwill” guidance on Fire Risk Assessment provided based on zero2five20**
- ✓ **Incorporate Lithium ion risk into storage contract (look at site acceptance procedures**
- ✓ **Stop promoting/selling firestick and shift to a better(lithium capable) fire extinguisher product**
- ✓ **Promote a suitable training course**
- ✓ **Work towards a wider workshop to incorporate wider caravan and park site owners – share the best practice and share the risk**

CURRENT CASSOA GUIDANCE ON FIRE SAFETY— requires changing for 2 reasons

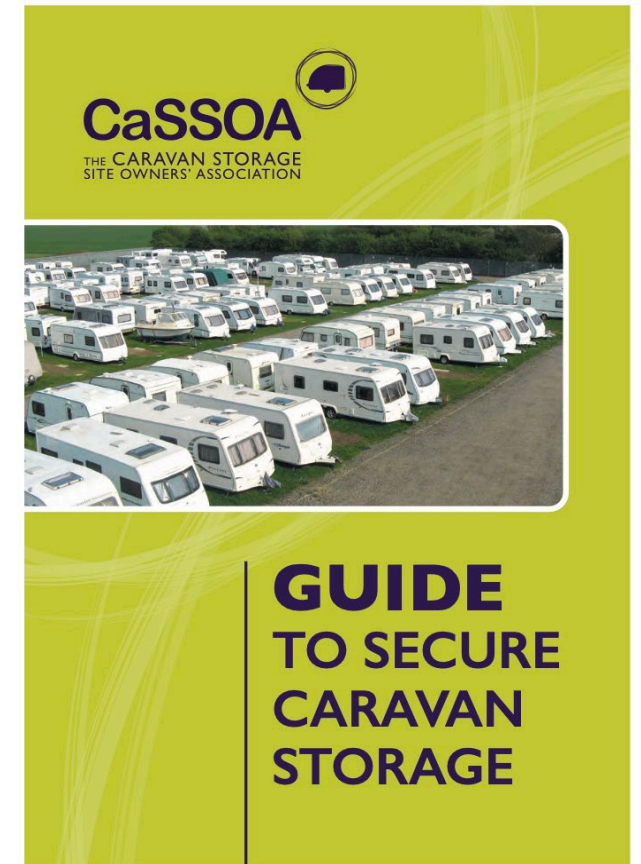
1. The CASSOA guidance predates the proliferation of lithium-ion batteries in the industry.
2. **The Regulatory Reform (Fire Safety) Order 2005 applies to caravan storage sites and stipulates that a fire risk assessment be carried out.** Current advice to members requires updating to reflect changes to fire safety law w.e.f - 1st October 2023. Main changes are that :
 - Responsible Persons **must record their completed fire risk assessment, and in full** (where previously only specific information was required to be recorded)
 - Responsible Persons **must record the identity of the individual (their name), and their organisation (name) engaged by them to undertake/review any or all of the fire risk assessment**
 - Responsible Persons **must record their fire safety arrangements (demonstrate how fire safety is managed in your premises).**

Responding to these changes could be expensive unless common sense prevails.

Managing the risk FRAs

This new risk requires a different level of awareness when undertaking the FRA. To support members, it is recommended that

- ✓ **CASSOA Guidance to be amended to reflect changes as discussed (FRA's, separation distance, risk of lithium-ion batteries and need for vigilance).**
- ✓ **Enhanced training and awareness.** Increasing knowledge and awareness in staff who are responsible for managing the risk at both a strategic and day to day level. This training should make staff aware of the risk, and to understand the early signs and symptoms of thermal runaway. **It is recommended that the industry adopt level 1 training for all staff involved in storage site management. – cost £20 (ex VAT).**
- ✓ **Additional “goodwill” guidance on Fire Risk Assessment provided based on zero2five20**



Members must include the dangers of lithium-ion batteries in their fire safety analysis:

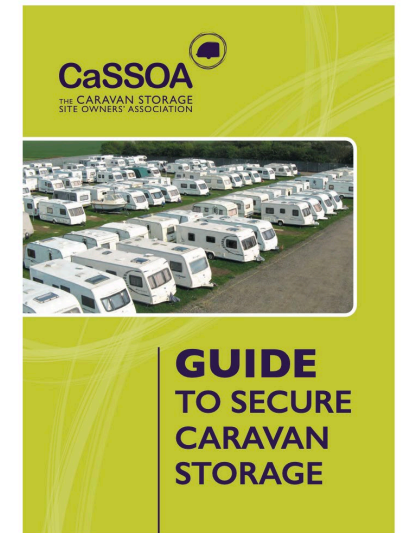
- **Identify Fire Hazards** - Sources of ignition. Sources of fuel. Sources of oxygen.
- **Evaluate the risk of a fire starting.** Evaluate the risk to people from a fire. Remove or reduce the hazard. Remove or reduce the risks to people from a fire.
- **Protect people by providing fire precautions.** Record, plan, inform, instruct, and train. Record any major findings and action you have taken. Discuss and work with other responsible people. Prepare an emergency plan. Inform and instruct relevant people. Provide training
- **Fire separation.** Each stored caravan should be allocated around 30 square metres of space, with the respective caravan jockey wheels set at a distance of at least 3 metre centres.

Changes required *

- **Guidance on back-to-back parking (1-metre-wide corridor between the rows to act as a firebreak) makes no sense.**
- Wherever possible the respective owners should remove the gas bottles from caravans. If it is not reasonably practicable to remove the gas bottles they should be turned off and disconnected from the internal appliances – **they should be covered with a suitable textile**
- **Provide suitable firefighting equipment – think about new technology of multipurpose fire extinguisher – not firestick!**
- **Include lithium battery risk in the review – members should be trained to understand the risk**


Managing the risk FRAs

1. The storage site owner reads the zero2five20 goodwill advice note and completes the tick box questionnaire. **This is a great first step to meeting the FRA duties.**
 2. The owner reflects on the answers to the questions and decides if
 1. They are happy that they have undertaken a suitable and sufficient assessment and have a clear understanding and a clear plan to reduce risk. **They do not need any further assistance.**
 2. They think they have a good understanding but would like to discuss the outcome with someone with a strong firefighting background . **They feel they need some professional support to benchmark their findings. A one-hour consultation can be provided through PackAttack**
 3. They are concerned that the site is quite complex, and **they need a competent and registered fire risk assessor to undertake the FRA on their behalf.** This can also be procured through Packattack or directly by the site owner.
- **Enhanced training and awareness.** Increasing knowledge and awareness for staff who are responsible for managing the risk at both a strategic and day to day level. This training should make staff aware of the risk, and to understand the early signs and symptoms of thermal runaway. **It is recommended that the industry promote training for all staff involved in storage site management.**
 - **Early detection.** Reception procedures should include questions about lithium batteries present in the vehicle. Where CCTV is fitted, the potential for thermal scanning should be considered. Where a site has onsite security staff, they should be trained in identifying early signs of thermal runaway. **These measures are covered in amended guidance.**
 - **Early intervention.** Onsite fire equipment might include fire canisters, small (personal) fire extinguishers and suitable fire blankets (lithium) .
 - **Solar panels should be isolated whilst in storage to mitigate batteries being charged. Use of light blocking films or bags should be encouraged.**





CaSSOA
THE CARAVAN STORAGE
SITE OWNERS' ASSOCIATION



**GUIDE
TO SECURE
CARAVAN
STORAGE**

CaSSOA – Thank you