

# Introducing Large Atmospheric Storage Tank Fires (LASTFire)

The Large Atmospheric Storage Tank Fires (LASTFire) group has become the leading international forum related to developing best practice guidance on all aspects of storage tank fire hazard management.

LASTFire is a consortium of 16 international oil and storage companies who review the risks associated with fires in storage tanks. The team develop best industry practices to mitigate the risks based on extensive research, academic studies and experience.

The LASTFire project was launched in the late 1990s to review the risks associated with large diameter (greater than 40m) open top floating roof storage tanks. The project was initiated due to the oil and petrochemical industries recognition that the fire hazards associated with large diameter, open top floating roof tanks were insufficiently understood to be able to develop fully justified site-specific fire response and risk reduction policies.



Original Study 1993-1997

A true fire hazard management (FHM) approach to reducing the fire associated risk to as low as is reasonably practicable, was adopted during the project. This is in line with current regulatory trends towards preparation of 'safety cases' whereby

all aspects of risk mitigation including incident prevention are reviewed.

LASTFire was founded by international industry expert, Niall Ramsden, who has 40-plus years of experience working with fire fighting foam. More specifically he has:

- Worked with foam manufacturers in technical, engineering and research roles
- Been an Independent consultant since 1990, working in more than 90 countries
- NFPA 11 Foam Systems committee member for more than 30 years
- EN13565 Part 2 Foam Systems committee member
- Etank fire Project involvement: reviewing foam application to water soluble fuels
- Energy Institute Process Safety committee member
- Extensive experience of running fire performance tests and demonstrations.
- LASTFire coordinator: leading research in testing in fluorine free foam





- Adviser at Buncefield Terminal multi tank fire event

Under the direction of a project coordinator, a working group including Shell and BP Research personnel worked closely with the project sponsors to investigate these risks and to disseminate the findings of the review in the form of a comprehensive 300 page document including:

- incident frequency survey
- review of incident escalation mechanisms
- risk reduction options
- review of foam properties
- risk workbook
- lightning issues review
- foam performance test for storage tank fires

The LASTFire Project provided an independent and comprehensive assessment of fire related risk in large, open top floating roof storage tanks resulting in a methodology by which site specific fire hazard management policies can be developed and implemented. It therefore represents a major advance in the knowledge of this risk.

Recent follow up work has included the development of the LASTFire Risk Workbook into a fully computerised analysis tool,

the delivery of a Storage Tank Fire fighting Workshop for RPI's clients worldwide and the development of a foam performance test exclusively for storage tank application.

### What are the LASTFire deliverables?

- An Incident Database establishing, in a rigorous way, incident frequency statistics related to fires in open top floating roof storage tanks. This has been updated at regular intervals since the initial study.
- A Risk Reduction Options (RRO) document, which discusses the various options available to an operator to reduce risk through both prevention and mitigation based not only on manufacturers data but also feedback from field experience of members. Again, this has been updated on a regular basis to include new technologies and operational experience.
- A Risk Workbook that allows an operator to develop site specific risk based FHM policies.
- A Test Protocol for the evaluation of a fire fighting foam and its performance related to the specific requirements of a storage tank fire
- Test reports on the evaluation of fluorine free fire fighting foams, including small and large scale testing and testing on different

fuels including crude oil.

- Training material and practical workshops developed by fire fighters for fire fighters, describing the strategies and tactics for responding to tank fires.

LASTFire develops best practice guidance based on testing and field experience. Typical subjects have included:

- Linear heat detection systems
- Boilover issues
- Foam position paper
- Internal floating roofs
- Foam assurance
- Test witnessing

As recognised experts in the field of storage tank fire hazard management, the LASTFire Group, on an independent expert basis, witness performance-based testing of systems and innovations.

### Typical research work

Previous concentration has been a focus on boilover studies with an aim to providing responders with better information on time to boilover, boilover consequences and fire fighting foam application strategies.

Two member companies have shared theoretical models with the rest of the Group and the experimental data is being used for validation purposes.

New research proposals include research into improved protection methods for internal floating roof tanks and vapour measurements under geodesic domes. Research is also proposed to study bund fires, including understanding foam travel rates, foam application rates and a comparison of foams.

“Over recent years, we have carried out a number of significant research projects thanks to group funding through the membership fee. The results have had a significant impact on our understanding of critical issues such as boilovers, vapour suppression, foam performance testing and of course the transition to fluorine free fire fighting foams”, said Ramsden.

Member companies can benefit from:

- Membership of and influence within an internationally recognised industry body specifically related to storage tank fires
- Networking with fellow professionals
- Immediate access to latest incident databases, risk reduction practices and guidance notes
- Access and influence on practical research work
- Benchmarking with other relevant organisations
- Knowledge sharing in the form of webinars, seminars and workshops.

Representatives from each operating member company make up a steering panel. At regular meetings the Panel make decisions on research topics and conduct reviews of deliverable updates. These decisions and reviews are then put into practice and distributed to the rest of the members.

Suppliers are not allowed to join the steering panel and so there is no commercial influence whatsoever on the decisions made.

LASTFire has established itself as the recognised international industry forum related to storage tank fires. It now continues on an ongoing basis with updates



of deliverables, dissemination of knowledge and development of best practice guidance based on risk-based understanding.

The Group is keen to expand membership and so widen the networking and research aspects to advance storage tank fire hazard management knowledge.

If you need any further information on the work of the Group or the membership structure, please contact the project coordinator on [info@lastfire.org](mailto:info@lastfire.org).

Further articles will be featured in Fire and Rescue International magazine, with some exciting footage of testing! 