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Barry Browning, ex Fire Chief at Fawley Refinery, reports on a training exercise that used critical equipment he helped to source and install.

Foam concentrate supply with Williams foam induction equipment. Top: foam streams over the top of the storage tank.

Testing the big guns at Fawley Refinery

It is universally accepted that to fight a full surface storage tank fire successfully large amounts of water, foam concentrate and the hardware capable of projecting firefighting foam onto the burning surface area must be available simultaneously for a minimum of 60 minutes.

How this can be achieved must be addressed site by site, clearly highlighting the need for close liaison between petrochemical plant and the municipal fire and rescue services.

The wakeup call came in 1983 with the full surface fire of a 75-metre diameter floating roof tank containing crude oil in south Wales that presented many problems to the fire response crews over a prolonged period, culminating in the "boil-over" phenomenon.

As the Fire Chief at the Fawley Refinery – and having attended this incident – it became very clear to me how vulnerable the refinery was with respect to its then capability of fighting a full surface tank fire, with the knowledge that there was a major deficit in water supplies, foam concentrate storage and lack of large capacity foam monitors onsite or indeed

available within the UK during this period.

Responding to this situation, meetings were held with management and senior officers of the local fire brigade to determine what action should be taken to improve the fire fighting capability.

As Fire Chief, proposals were put forward with priority on replacing two aged fire trucks pump capacity of 4,000 lpm with fire trucks of 8,000 lpm pumping capability, double foam concentrate stock, purchase of a number of Slim Jet and Titan portable foam monitors (the largest available on the home market) and develop plans to seriously improve water supplies. A number of flow tests conducted in tank farm areas had shown a major deficiency in certain areas eg 8,000 lpm available where the demand would be 53,000 lpm or more.

Over a period of time these proposals were actioned, and agreement reached to provide additional water supplies with a plan developed to

tap into the major cooling water supply lines, ie 48"/36"/24" diameter above ground, salt water mains high volume low pressure, with the provision of 8" manifolds providing 6: (150mm) and 2.5" (70mm) outlets on each manifold strategically installed in selected areas around the site clearly identified for the use of emergency services only.

In addition, one mile of 6" (150mm) hose was purchased plus two purpose-designed hose trailers – sufficient hose to provide fire water half a mile from each tank farm.

In Fawley's case, it was established that two miles of 6" hose would be required to provide sufficient volume of water to feed two large capacity foam monitors (24,000 lpm per monitor).

Over recent years there has been a change in philosophy for extinguishing full surface tank fires with minimum risk to firefighters, utilising high volume monitors that can be sited well away from the tank involved, thus avoiding the necessity of siting smaller capacity portable monitors inside the dike area, and exposing firefighters to unnecessary risk.

With this in mind, and to further improve tank firefighting capability, a major project was developed to purchase an additional mile of 6" (150mm) hose with associated ancillary equipment, two large volume foam cannons (Angus Colossus), although following extensive tests this was changed to two Williams Six Guns, and modification to two of the refinery foam trucks to provide one 6" (150mm) valved Storz delivery on each truck plus the purchase of one 6000 GPM (24,000 lpm) towable diesel fire pump providing flexibility for fire water availability.

With equipment now onsite and changes made, ongoing training continues being conducted both with refinery fire and response group and – most importantly – jointly with the municipal fire and rescue service. This culminated in November 2007 with a major tank fire exercise involving five counties, where crews from Hampshire, Dorset, Berkshire, Surrey and the Isle of Wight joined Fawley's fire and response group.

Without doubt Buncefield oil terminal incident focussed both petrochemical companies and municipal fire response groups alike, and with close



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An 8" manifold and high volume pump a quarter of a mile from the tank.
Below: refinery fire truck and 24,000 lpm diesel pump in action.

"Over recent years there has been a change in philosophy for extinguishing full surface tank fires with minimum risk to firefighters, utilising high volume monitors that can be sited well away from the tank involved."



Silvani launches centre of excellence for monitors

A new, innovative range of fixed monitors has come about as a result of cross-regional collaboration between UTC Fire & Security's fire safety EMEA companies. Production of the new monitors was launched in January 2008 and has led to the creation of a new manufacturing Centre of Excellence at the Silvani plant in Como, Italy.

When UTC Fire & Security bought firefighting equipment manufacturer Kidde Plc in 2005, it inherited more than 12 manufacturing sites across Europe, Africa and Australia. Kidde was considered a valuable acquisition because of its reputation for excellent customer service, but product line development was identified as an area of opportunity.

One of the main challenges lay in the production of firefighting monitors, large bronze or stainless steel nozzles, used for fixed petrochemical and other high hazard fire fighting. Five different Kidde plants in the Europe, Middle East and Africa region all made monitors using a wide variety of designs, which limited product innovation.

Recognising the need for an overall product development strategy, Michael Mills, Product Manager at Angus Fire, one of UTC Fire & Security's Fire Safety EMEA companies, began analysing all of the existing monitor designs.

"While some of the monitors were limited in application, expensive to make and out of date," Mills said, "others were essential to the business, customer-specific or served niche markets and could not be discontinued without putting sales of other product lines at risk."

After much research and analysis, Mills and his team were able to incorporate the most advanced designs from each of the existing monitor lines into one single product line.

"This approach significantly streamlined our product portfolio while also ensuring that each EMEA company had access to improved features," Mills said. "Also, nearly all of the models produced in the new Como factory are at a lower cost - in some cases as much as 50 per cent."

Mills' team also recognised at an early stage that efficient execution was critical to successfully producing the new line. As a result, all monitor production was moved to the new Silvani plant, which is the largest manufacturer of monitors in the EMEA region.

By transferring all of the design and development expertise to this new Centre of Excellence, the EMEA team was able to achieve greater production volume and significant cost savings. Improved technical support was another key benefit. Mills' team and Silvani were recognised for the project in January when delegates from all of the EMEA sites and guests from UTCFS companies in Australia, Brazil, Argentina, Russia and Eastern Europe attended the product launch at the newly-coined Centre of Excellence in Northern Milan.

The new product range breaks new ground in technology and commercial competitiveness. The changes also allow all EMEA companies to use their own brand name when marketing the new product line.

liaison the incident was handled professionally by all involved.

The exercise was a massive logistical project with responding crews providing the required pumping capacity utilising their recently acquired HVPs (high volume pumps) under a new government scheme. These pumps are capable of delivering around 8,000 lpm connected into the 8" manifolds. In addition the two refinery 8,000 lpm fire trucks were utilised feeding one six gun, with the 24,000 lpm diesel pump supplying the second six gun.

With all the units operating and operational pressure of 9 bar achieved, foam concentrate was introduced to both monitors sited on the roadway adjacent to an empty 45 metre diameter FR tank with both foam streams meeting easily the trajectory required. For the first time an RAF (Royal Air Force) Chinook helicopter was used to transport one of the HVP units into the refinery, lowering it alongside a fresh water reservoir.

This was clearly a successful exercise, objectives achieved, demonstrating how critical it is for pre-planning and to understand the logistics involved dealing with a storage tank full surface fire, underlining once more the importance of liaison between industry/municipal fire response crews. ■

