REPORTS:
2015 Annual Autumn and General Meeting
Fire Conference at Hampton Court Palace
QI Training Day in West Yorkshire
Spire Repairs at St Mary’s, Clapham

FEATURES:
St Peter’s, Pirton, Worcestershire
St Nicholas’, Radford Semele, Warwickshire

TECHNICAL:
Fire Engineering in Heritage Buildings
This conference organised by the EASA on 8-9 October 2015 was to some extent an experimental venture: a 2-day meeting held in the Autumn. The attendance was lower than expected (members too busy to devote two working days in the Autumn to CPC perhaps), but the content was timely and excellent. By the end of the conference the list of historic buildings damaged or destroyed in recent fires was etched in our brains: Hampton Court (1996), Uppark (1998), Windsor Castle (1992), Cumming Museum, Southwark (2013), Glasgow School of Art (2014), Battersea Art Gallery (2015) and Cladon Park (2015). The first day addressed risk assessment, prevention and mitigation strategies, and culminated in a tour of some of the Palace. A great deal of what we learnt sounded like common sense, but the strategy had to be fully understood, effective and maintained. David Parkinson, in charge of Risk Management, EAG assessed the risks from an insurer’s point of view: stop it happening, know it happened, restrict its spread, extinguish it, and manage the consequences.

Fire alarm systems could be hard-wired or wireless (an advantage in historic buildings) using various methods: detecting beams, aspirating systems and thermo cables (for example in ductwork). Aspirating systems use capillary tubes and are unobtrusive. Maintenance is key and systems should be tested weekly. The issue of voids was mentioned several times during the conference: large roof voids need detection; and small (usually unknown) voids greatly increase the risk of fire spread. Solving one problem could sometimes cause another. We learnt that one property had an issue with gutters freezing, so trace heating was installed. An electrical fault set fire to a bird’s nest, which then ignited the roof timbers.

Under the heading of ‘exiguishing it’, all the following issues would need to be considered and regularly reviewed: is there access for the fire appliance, with bridges strong enough or archways high or wide enough? Is there hard standing area and access to all sides? Are fire hydrants pressure tested? Is the pressure constant? When did the Fire Brigade last come to site? Has the Fire Brigade personnel changed? Once the fire is out, the owners need to gain control of the building and embark on the following: protect the structure, provide scaffold support, provide information on possible asbestos or other contaminants, arrange a clean-up, and create an effective business plan.

Restoration of a historic building takes time. Spending money on prevention and detection is money well spent. The second speaker, Andrew Nicholson had some 18 years’ experience in the field and in 2011 set up The Fire Surgery – a consultancy specialising in fire engineering design, especially to historic buildings. He had worked on a number of important and unusual buildings and was perhaps most well-known for enabling the Sam Wanamaker Playhouse (a timber re-creation of Shakespeare’s Globe) to present performances lit by candlelight. His modus operandi is to go back to first principles and seek answers. From this information he creates a Fire Safety Plan for a building, with which he can show that it is safe to modify standard solutions, whilst still providing the necessary levels of protection to users and the building contents. For instance, if there is a stairwell in every room you do not need fire signs; and call points can be painted to match the walls. He used Croome Court as a worked example for this process in action, and has contributed a detailed article about this elsewhere in the Journal.

We then heard about Fire Safety Plans from the view point of a custodian: Steve Emery, a National Fire Advisor for Historic England. The main causes of fire, he said, are electrical, arson, hot works and cooking. He noted that the incoming electrical supply never gets tested, being the responsibility of the supplier, and there have been an alarming number of fires in churches attributed to failure of the electric main. Architects have been aware of the dangers of hot working since the fire at Uppark: it is safest to avoid it by prefabricating off site, but if that is impossible, it must be executed under highly controlled conditions following a risk assessment and method statement. He reminded us that there are other dangerous heat sources like angle grinders, heat guns and halogen lights. We learnt that whilst the ignition temperature of different materials was around 450°C, the flashpoint (when vapour ignites) can be as low as 180°C. This explains why a fire spreads so quickly once some furnishings and fabrics are alight.

The fourth talk of the day was about Hampton Court Palace by Terry Crowdy, Fire and Emergency Planning Advisor for the Historic Royal Palaces (HRP). The 1996 fire was a tragedy, but nothing changed. It was not until the fire at Windsor Castle that the government looked at fire precautions, resulting in the Bailey report (1993). The main recommendations were: Fire risk assessments, automatic fire detection (APD) to L1/L1P standards, better fire compartmentation, improved means of escape, salvage priority plans and trained salvage teams. This strategy remains valid today.

The fire in 1986 burnt for 6 hours before detection, and at that time there was only basic compartmentation. Voids in historic buildings are particularly problematic, and will require likely areas, e.g. behind panelling, to be opened up and plugged with fire stopping. Voids that remain need to be monitored, with ‘detection in every area larger than a cubic meter’ being the guiding principle. Adding fire protection in an historic environment requires careful and creative thinking; in the painted ceiling above the King’s Grand Staircase, an aspirating detector has been inserted in a peacock’s eye! We were challenged to spot it on the tour.

Given the treasures contained within the Royal Palace, we heard about the precautions taken to ensure their survival. Salvage priorities have been identified and the HRP have four teams of salvage volunteers, who practice handling and moving objects. The Abrahams tapestries are a rare set of 10 and are hung on wooden tabs which can be detached by a quick pull of a string. However, it still takes about 12 people to roll up a tapestry.

This is but a taste of the wealth of information we heard during the day, which ended with the guided tour – led for the Red Group by a former Head Warden, who provided more personal anecdotes.

For some, the next day began with a spectacular walk through Bushy Park on a glorious early autumn morning. The stags were already parading and conditioning themselves for the rut to come. The approach to the majestic Hampton Court Palace was viewed through mist in front of a rising sun: no one can fail to appreciate the importance of such a national treasure.

Our first speaker was Wayne Brown, Deputy Assistant Commissioner in the London Fire Brigade (LFB). He shared and expressed with enthusiasm his passion for London and our national treasures: some 40,000 listed buildings and heritage sites. With 24 years experience...
he was all too well aware of the destruction that fire causes. He discussed the causes, consequences and strategies deployed at various high profile sites and spoke of the effort being spent to improve ways in which safety can be maintained and damage to national treasures avoided.

Wayne illustrated his talk with a number of case studies: the Turing Museum Southwark (March 2015), Hampton Court Kings Apartments (took 6 years to repair & E330m to restore), and fires at Buckingham Palace, Windsor Castle and the Cutty Sark. These events represent a significant loss to the nation and in each case lessons are learnt and the programme for fire fighting in listed buildings reviewed. Wayne referred to the Fire and Rescue Service Act (2004) Operational Guidance National Coordination and Advisory Framework which underpins and seeks to bring consistency across the sector (National Guidance is primarily to protect life, to have an awareness for the safety of fire fighters and to reduce the risk of loss. Collaboration between the LRFB and other fire brigades and business partners including the National Trust, has seen a single strategy widely adopted.

Using the experience of previous fires, the challenge is to recognize features in a building which increase the danger of loss. These include voids, the layout of the building, its age, and the location of a water source. The danger of structural collapse by fire fighters is often due to decay and lack of maintenance. Old furniture is often toxic and can aid in the spread of fires. A plan for evacuation and staff responsibilities cannot be over stated. Fires often start of business hours, and an information pack needs to be available to the first responders on site. The fire brigade must be familiar with each site and have quick access to essential up-to-date information. Once the first priority to protect life has been dealt with, a salvage operation can be put in place.

Prevention and planning ahead is key. Fire risk assessments, audits, and the employment of a fire assessor with experience of Historic buildings, are vital. A staff member needs to be designated and trained as the fire site manager, and emergency procedures rehearsed on a regular basis with clear, simple salvage priority lists which are kept up to date. Then after an incident, the fire investigation units will follow to examine the behaviour of the fire, sometimes using trained dogs kitted out with protective coats and boots.

In the next talk on the structural effects of fire in historic buildings, Clive Dawson of Hockley and Dawson, consulting engineers, began by describing different forms of structures: mass gravity such as earth structures and solid stone walls, or more sophisticated engineered structures such as bonded masonry and timber or steel framing, where the loss of a component may remove the structural stability. The integrity of the engineered structure can fail if joints are affected by decay and major deflections will occur during the cooling process after a fire. Illustrating his talk with case studies, he emphasised the importance of early prosing after a fire for stability and weather protection, before safe access can be provided for analysis. The design of structural scaffolds is then critical: they should be independent, free standing and able to resist wind loads. The concept of a ‘temporary scaffold’ should be entirely discounted. They could be there for a long time. They need to be designed and specified in detail to the standard of a permanent structure to suit the needs of later repair works. He discussed the options for weather protection, issues particular to tall buildings such as the Monument in the City, and how to keep historic buildings open to the public whilst works are in progress.

Clive attended the fire at Windsor Castle, where the massive damage included the loss of structural elements including a medieval timber roof and steel frame, and extensive water damage. Demolition commenced, carefully picking the buildings apart with rigorous monitoring and assessment by engineers, and stabilising of walls. A vast scaffolding and roof were erected to protect the exposed site.

At Jordans: Friends Meeting House in Buckinghamshire, listed Grade 1, as much as possible was preserved in place, for careful recording and restoration. Over in Kingston, Jamaica, we were shown how fire spread rapidly through the light weight timber framing used to construct the C18 Moreton Barrett House. At Tewkesbury Abbey, the effects of a major fire in 1178 are still being experienced in the pattern of weathering and spalling of the stonework.

Our last speaker was Andrew Brown, Church and Heritage Director at the Ecclesiastical Insurance Group, who took us through his tasks when dealing with a major fire incident. Essentially, he explained the whole claim process, with attention in particular to a client's expectations. When the phone call comes through, his first priority was to check the fire and meet the client on site, usually the same day. He immediately asks for the Asbestos Register, and contacts the Loss Adjuster to arrange a site meeting as soon as possible. He has access to contractors able to bring resources fast to site, and will authorise other expenditure on specialists in drying, salvaging and cleaning fire damaged buildings and contents. The key objective is to keep things moving swiftly and efficiently, so he facilitates early discussions on managing essential and continuing activities, such as church services; and he liaises with HSE or Cadw to ensure that there is agreement and compliance with their requirements for recording and preserving damaged fabric.

The two days were spent in the 'Garden Room', a pleasant conference facility tucked away near the old kitchen gardens. Members could enjoy their refreshments out on the terrace in the warm October sunshine. Of additional interest for us were two trade stands representing Compo Fire Systems and Siemens plc. At the Compo stand Douglas Cullen entertainingly demonstrated various detectors under real fire conditions.

Bob talked about the complexities involved for an organization such as the National Trust (NT). The variety of buildings owned and accessed in different ways by members of the public (some complex, some simple, some World Heritage sites) all require Plans which, by law, need to be regularly reviewed and updated against constantly changing requirements. The NT is seeking to bring a common standard across England, Wales and Northern Ireland through collaborative Primary Authority Partnerships. The fire regulations for chimneys are: the services are being cut out, and no longer automatically offer an appliance on the scene within 4 minutes. Speaking with bitter experience, he brought us back to the reality of the extreme damage fire can cause. The National Trust lost Grant Park House in 2015. At the time of the fire Bob was abroad in Iceland, and he talked of the issues arising from the social media and the spread of unofficial information (including film from private drones) before he could get back and begin investigations. The building was gutted in the fire, but fortunately with no loss of life. Early analysis showed that although there were systems in place, these were not resilient. There were issues with security, command strategies and critical response data. Most of controlling the social media and the outflow of information. Further analysis has shown that the compartmentation failed due to poor design, defective electrics, and a lack of maintenance. Badly lessons from Liddick, 20 years earlier, had not been learnt.

Richard Pediad

After lunch, we listened to Bob Bantock, a fire specialist with the National Trust. Referring again to the recent devastating fires at the Turing Museum, Southwark (2015), the Glasgow School of Art (2014) and Eastbourne Pier (2014), he explained that fire protection procedures installed in full accordance with guidance and regulations can fail where Fire Safety Plans have not been modelled, tested and updated.

Richard Pediad

Bob Bantock.

John Radice