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In response to a Government drive to improve arson attack conviction rates, Hampshire Fire and Rescue Service set up - as did other Fire Services around the UK - an Arson Task Force, working in conjunction with Hampshire Constabulary. Established in 2007 this partnership continues to operate. As part of this joint approach where the cause of any fire is doubtful, or if there has been a fatality, the Arson Task Force goes to work, with the Fire Service Investigators working alongside their police CSI colleagues. The Fire Investigators produce the evidence that the police need to prosecute or for a coroner to determine cause of death. As part of this the Fire Investigators are now recognised as expert witnesses in court.

#### **'We Make Life Safer'**

Since the Task Force was formed arrest rates (55%) and conviction rates (68%) have both risen significantly, in simple terms meaning that they are identifying arsonists and getting them off the streets. The Hampshire Arson Task Force & Fire Investigation Unit is recognised as one of the best in the UK and is a busy one: at time of writing it had 12 cases going to court, nine cases for which reports are being produced, plus several Coroner Courts on-going. Around 30 cases of arson go to court annually in the county.

The Unit is using iSTAR to help them understand fires that are not cases of arson but still require investigation to establish what has happened, and iSTAR is also proving to be an invaluable addition to help tackle more routine incidents, plus essential work aimed at improving the safety of fire crews and the public. The organisation's strapline is 'We make life safer' and Station Manager Damian Watts explains some of the ways in which iSTAR is rapidly becoming an indispensable part of their equipment.

## **CASE STUDY: Using iSTAR -Hampshire Fire and Rescue Service**

"We read a magazine called 'In Attendance', a tri-service publication which is distributed to Fire, Police and Ambulance stations across the country highlighting good working practices. It carried an article about West Midlands police who used iSTAR in a murder case, showing detailed 3D images of the crime scene to the jury, judge and legal teams without the need for them to leave the courtroom. This got us interested in iSTAR.

"We take photographs with ordinary digital cameras as part of the evidential package, sometimes as many as 200, but they don't really put the scene in context - it's a 2D flat image of, say, a door with some burn patterns on it. Having a 3D image of the room shows where the door fits into the fire scene and how it interacts with that fire scene. This additional level of information helps us for both criminal investigations and organisational learning.

#### **Easy Transmission of Images Back to Base**

"Through our Arson Task Force police colleagues we do have access to a 3D laser scanner but that takes a long time to gather the information and when working in a normal domestic room it often isn't worth the time it takes to set it up. Having iSTAR, which is quick and simple to use, allows us to easily transmit images back to base or show to others, with minimal software implications. It's ideal.

"So, having read the article we approached NCTech and Rob Jones came to give us, and several other departments in Hampshire Fire and Rescue Service, a demonstration. This led to us taking an



iSTAR camera on a trial basis to see what it could do at real fire incidents and evaluate its use in real life situations.

"The key benefit is that it enables you to put the whole scene in context, to be able to see - and show other people who are not fire investigators - how specific items interact with everything else. While it appears as a 2D image on your screen the 360 panoramic capabilities gives it a virtual 3D effect."

#### **Improving the Understanding of Fire Risks**

"Amongst those we have shown iSTAR images to are, for example, the Safeguarding Board which comprises safeguarding professionals from the whole of the county, including adult mental health professionals, nurses, and staff who look after the socially vulnerable. We had a meeting with them on the same day we had attended a fire in a residential care unit. An elderly gentleman had dropped a cigarette into his chair where it smouldered and then ignited. Being able to show the images we had taken to that group of professionals showed how the gentleman was living in his flat, the dangers he had been exposed to and also the dangers our firefighters had been exposed to. That allowed the safeguarding professionals to go away with a better understanding of the whole situation and how it affected the resident. They will be

putting in interventions to help him once he gets out of hospital.

"It will also help them avoid similar situations in other care facilities and it highlighted one of the problems we face in the fire service - falling cables. This is where there is a secondary fit of electrical cables which are put inside plastic trunking and fixed to ceilings and walls. In a fire the trunking melts and the cables fall free and can entangle those trying to escape or our firefighters entering to rescue them and/or put out the fire. This happened in the care home. Fortunately the cables caught up on a door, but by using iSTAR images we could easily show the risk this represents and those on the Board are now aware of the problem.

"It's been a very good addition to our kit. We had it on a two week trial and then bought it. I think we are the first Fire Service to use it and I've put details onto the Chief Fire Officers Association (CFOA) forum on how it has helped us clarify our thinking towards fire investigation and I know this has led to some other Fire Services contacting NCTech.

"iSTAR is easy to use - just like a 'point and click' camera. It does what it says on the box! The thing I like about it is its very good low light capability, especially in the HDR mode. A lot of the work we do happens at night and it picks up good quality images with minimal lighting. That, plus the portability, confined space capability and the ruggedness of it really helps in the environments we work in.

#### **Hot Spotting Tags Bring Up Essential Information on the Image**

"NCTech is doing more development work on the camera, some of which we have asked for. Things like 'hot spotting' where you can bring up different information from an image. A tag is put into an image and, when you click on it, it will bring up a

separate image or a piece of information. For example, I could click on a gas boiler in an iSTAR image and it would bring up all the risk information about that boiler unit.

"Something we think we will use it for in the future is for SSRI - Site Specific Risk Information - work on high risk buildings. It's also known as a 11D visit - section 1 paragraph 1 subsection D of the Fire Services Act. This is about gathering advance information on a building so that we are best informed should there be a fire - what the risks are and how to tackle a fire there. Part of that is that I can go and take 360 degree images in the building using iSTAR and we can get a detailed 'walk through' of the whole building

We could then click on, say, the computer room and 'hot spotting' will bring up all the firefighting equipment in there and what the risks are in the room. In historic buildings, of which we do a fair number, we could click on the image of a room and then the tag will tell us what needs to be salvaged first, for example, a particularly valuable painting, or what can be left. This type of information informs our tactical plan. On the fireground, incident commanders can look at the images and prioritise what they need to do. Being able to gather and then easily access this sort of visual information in real time is invaluable.

"As I said, its portability is great. We can get it set up in a couple of minutes and get real time info, rather than wait 15 or 20 minutes while a laser scanner does its work. iSTAR's almost instant. I can take an image as soon as I get there, then another every, say, five minutes, and get a picture of the incident progresses.

#### **Delivering Tactical Management Information to Incident Commander**

"During the trial, any Level 2 fire that occurred we took the camera along and

one of these instances was a ten-pump fire in Portsmouth. We got there when it was only at two pumps, took images, processed them on the ground and showed them to the Incident Commander. Once an incident gets to ten pumps he needs to stay back and deliver tactical management from a nearby remote location. Because we went there so early we were able to take him those images and show him his fireground and where his resources were, so he was able to make some real informed decisions about the tactics to tackle that fire.

"We've also used it on a couple of RTCs - Road Traffic Collisions - which are purely investigated by the Police, who use the 3D laser scanner for serious accidents. They have been interested in what iSTAR can do because if they can gather the essential information faster and get the road open quicker, then it's a real plus.

"It's also gone along to a large animal rescue, a bull stuck in some mud. We used the images from that for debriefing the crews. We can use the images to jog their memories and put the scene in context - where they were positioned, what they were doing and what we could have done better. So, ideal for training purposes, too.

"There are operational implications we need to address in that if we only have one iSTAR unit I need to work out how we keep it in use 24/7. Last thing we want is it sitting on a desk not in use.

"NCTech have been very interactive. Rob Jones gave my investigators a lot of time, showing how to set it up, use it, and they are doing work on the software side for us, like the 'hot-spotting' on images we supplied. The support we have had is allowing us to use that camera to the best of our ability."

*Photographs highlighting the iStar camera's use courtesy of Hampshire Fire and Rescue Service.*

