



## **BODYCOTE discovers IP video is a valuable management tool for industrial production environments.**

**“We started down the path of wanting to monitor for better security around the plant and the doors to the building. Once we got the surveillance system installed and running, we realized that not only does it serve that purpose, but for our particular application it's even more beneficial for watching production, the movement of materials in and out, to protect the expense of those materials for our customers, and the safety of our personnel in the production environment. We have realized the benefits of adding more cameras in strategic places to see all of this, too.”** - Henry Peterson, Group Engineer at Bodycote in Camas, Washington.



**Challenges:** This 30,000 square foot plant performs heat treatment of hi-tech alloy components for the aerospace, military and medical industries. It is in operation round the clock but with smaller shifts at night and on weekends when there were problems with theft of its scrap metals behind the building.

**Solution:** Since February 2006, Bodycote has been using Milestone XProtect Professional IP video to manage Sony network cameras. The solution is installed and serviced by IP Pro Tech, a certified Milestone partner.

**Advantages:** Perimeter security was the original motivation for buying the system but they quickly realized its value for tracking the status of work in progress, managing resource utilization, resolving customer claims, and improving personnel safety. The flexibility and scalability of IP network video allows them to respond to special needs quickly. The excellence of the security system has even become a selling point for important customers who demand strict tracking on their product deliveries: Bodycote has full visualization of all parts while on their site.

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Bodycote, with headquarters in the UK, is an international company with heat treatment facilities across the USA and overseas, processing such things as jet engine components, platinum ingots, and aluminium parts. In the US, four plants do Hot Isostatic Pressing (HIP) and another 50 perform heat treatments for tempering or aging materials to strengthen them.

In this plant near Portland, Oregon, Bodycote does the HIP process that consolidates or densifies castings. In the pouring of liquid metal there is an air pocket trapped in the middle of the material that can get locked into it before it can rise out of the material. These would be weak points under pressure that could fall apart eventually. These are called voids, and Bodycote works with them in a pressurized process that moves these defects to be external instead of internal, which can be fixed in the castings in a machinery operation without having to grind or re-weld. Bodycote puts the parts under extremely high-pressure, with a furnace that has temperatures up to 30,000 PSI in gas pressure that exceeds the yield strength of the material to squeeze the wall and push the air pocket



defects to the outside of the part wall. Usually the parts manufacturers in the foundries leave a little extra on the outside to deal with this.

This Bodycote location has about 70 employees, working year-round 24/7 to keep up with the parts foundries, whose castings get processed here to remove defects. It is a demanding production environment.

"We originally went after the surveillance to monitor some theft we had in the back of the building of scrap metals. However, this surveillance system actually has a better benefit for us as a tool for monitoring our production process control than for security!" explains Henry Peterson, HIP Group Engineer at Bodycote in Camas, Washington.

### Cameras replace humans in unsafe situations

Henry Peterson remarks that there are safety or risk issues with all the equipment, heavy materials, forklifts, and furnaces, which they now can monitor more easily with the IP video surveillance. "I think the second day after we got the system installed, someone tripped on a pallet and fell, breaking their finger."

Bodycote works with Argon gas that is inert, colorless and odorless and does not support life. It is heavier than air so if there is a hole in the ground, it flows into it, but if a person gets in there they would die.

"So we have a lot of holes in our plant floor where the equipment goes in with that gas," says Henry. "That risk is something we need to monitor closely along with other dangers in our production environment. **It's a huge benefit to be able to put a camera where you don't want to have a person.** We're planning to put even more cameras in places to monitor the safety of our personnel."

### IP video in 'The Pit'

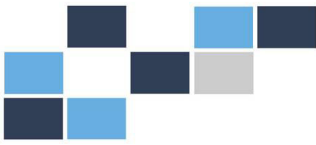
"What really convinced me of the Milestone system's flexibility is illustrated by this event: I needed to see inside a huge HIP furnace where we cannot put a person – it weighs about two tons – to watch when units get put inside. It has to get plugged in to the bottom of the furnace properly, but we did not want a person in danger – trapped inside there," insists Henry. "Our surveillance partner, Roger Finger at IP Pro Tech, knew how to set it up right away: it only took him about a half hour. He got a camera plugged in down there and a laptop with Milestone to watch that function to see inside where the furnace dropped down over the item. "



*(Roger has a VIDEO AVI made of this!)*

Roger describes it: "Imagine a pit 24 feet deep and 5 feet in diameter with a crane overhead that lowers a 2-ton heat treatment vessel made of metal several inches thick. I was asked to put a couple of cameras down there to monitor the alignment with the electrical contacts at the bottom for the parts going into the unit - where no one can see it from above. With all this weight and size, the alignment has to occur within a very fine limit so as not to damage the electrical components. I put two cameras there because one can see movement in the XY direction and the other in the Z direction, with one of them also a Pan/Tilt/Zoom to be able to watch the cylinder descend. The operator watches with Milestone on the screen and is able to ensure as it comes close to the contact points that it lines up – it worked with the first try! No humans were exposed to danger."





With lighting the chief consideration in this location - the pit is deep and dark – Roger chose a Sony P1 network camera and the SNC30 model. “These worked out very nicely. The SNC 30 is a real work horse - that camera does it all: it's more expensive but it's worth every penny because the optics and light performance are so good. I was pleasantly surprised with the P1: it's an inexpensive camera with a plastic casing that's not as rugged for an industrial site, but the low light performance is quite good and they also do audio which has proved useful in a number of situations.”

Bodycote bought two extra cameras after this so anytime they need to use them for a particular environment like that, they have them available to plug in, adding them quickly to the network, to use right away extemporaneously.

“Another Bodycote location in the country has an analog system and we can see how much harder it is for them to expand or change anything - they don't have our flexibility and scalability. Nor do they have the remote access capability that we do with Milestone IP video,” adds Henry.

**Surveillance system manages theft and more**

There are tools and equipment on the floor that are expensive, in an environment with round-the-clock shifts, doors open especially in hot weather in such production plants, and such attractive items as platinum wiring for the furnaces.

“Some other Bodycote facilities had theft of these repeatedly, and I wasn't going to let it happen here. We started to see theft of the scrap metals from our area out back, and some vandalism, which instigated my investigations into getting surveillance,” recalls Henry. “Corporate approved the acquisition to address these loss risks, and we thought it would be more of a background system in place in case we needed it, but we soon realized what a benefit it is to us as an active management tool to run our business better and safer.”



Roger helped Bodycote figure out how to rationalize their system performance for best use of the hard drives. “We'll improve the storage capacity to be able to keep video archived up to 45 days, instead of the 20 they started out with,” he comments. “Milestone XProtect also takes advantage of compression technology to get better performance.”

Roger showed Bodycote how easy it is to make an evidence file to share with the police, if necessary, or to keep it archived separately before it gets removed from the database when new recordings are archived over it in time.



**Control Room overview of the plant**

Bodycote already had the network in place, so when they realized they could use the system for monitoring production and safety issues instead of just for security matters, all they had to do was simply buy another PC to install the Milestone for the control room to use it, too.

Three managers use the system in addition to the operations managers in the control room who can watch the plant all the time to see what is going on.

“Because they are running the equipment from up there, they can't

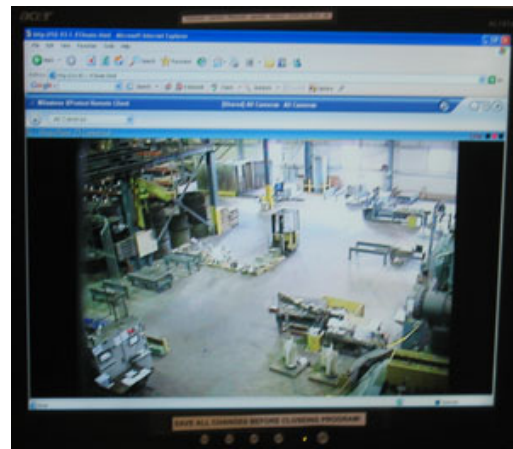




leave that room, so it's great for them to be able to see everything that is going on. It's been very helpful to them – they were previously confined to that room and not able to know what was happening all the time on the floor. Especially in the evening or weekend shifts when the crew is smaller, he can see his buddies when he's left alone in the control room, and if someone drives in and out, deliveries, etc. During the day there are probably 4 times as many people in the plant," says Henry.

**Video as a procedures training tool**

"Sometimes our people accidentally get something wrong in a load, so we like to watch everything that goes into the HIP unit. 24 hours later if something goes awry, we can go back in the system to see what happened where and when, by whom. We need to find out who made the mistake so we can train him, so we don't have to train everybody in the whole group all over again. This will help cut down on both training needs, our time resources, and improve safety," affirms Henry.



Daniel Swagger, Production Manager continues: "Furnaces at times can have millions of dollars of industrial equipment and parts in it. Our part mix is so extreme that we never have two loads that are the same. The system helps us see the loading techniques to monitor and improve procedures, also if you see someone doing something unsafe."

With the safety matters under control, Bodycote is primarily using the system now to track down what has happened when dealing with customer claims.

"The densification process often distorts (bends) when the voids crush and heal, so some customers may complain about something that is a natural part of the process and not our fault. Or if an inferior or damaged delivery arrives, like parts in special containers, we can show their quality upon arrival before we even work with them," explains Swagger.

"It's nice to be able to resolve those. With the time system in Milestone, and the fact that it only records based on motion detection, we can very quickly search and find anything," states Henry.

**Improved value for the customer**

"With the Milestone software archiving historical data on our production, it's good if any issues come up with customers on the delivery process," he continues. "We can see the exact stage in the production or logistics of their materials and any claims can be resolved. We can investigate if a customer claims someone dropped a casting and put a dent in it, by reviewing the video to resolve what happened. We can quickly run back through the video by date or time, when we knew their orders were in production – most parts are only here for 2-3 days for our process. We've got the cameras set up so we can see the staging areas where they pick up the product and move it, put it inside the heating units, on the docks, everything. We can follow them all the way through our facility."

They have one customer who brings in some very important parts, which they want Bodycote to track the entire time they are in custody, keep them locked up and be able to tell them when and where they are moved, leaving the trucks and back to the trucks again for final delivery. They are improving their own quality process and tracking systems, and came to audit Bodycote's facility as part of that.





“We do the recording of deliveries especially for this customer with strict tracking audits – they are really big business for us – and they require a security system like this,” states Swagger.

“All we had to do was buy one more camera to ensure the coverage they required!” smiles Henry. “We didn’t have to get a new system for this – the Milestone scalability was a big advantage. It was so easy to just add another camera; we already had the system in place that we needed. It’s been a good system with a lot more value to it than I originally anticipated.”

### Challenges of plant installations

“IP Pro Tech reviewed our facility and came up with the specifications for this Milestone-Sony IP video solution. I compared to other systems, including analog that were less expensive, but it was clear that it’s easier to expand with IP video. The scalability future-proofs our investment,” attests Henry.

This Bodycote plant is quite large at 30,000 square feet, with very high ceilings. The steel girders in the building structure proved to be a special challenge for IP Pro Tech when installing the surveillance cameras.

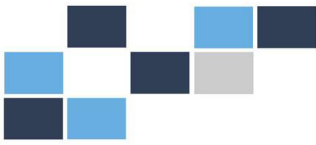
“The girders are difficult to drill into so we made some jigs, I guess you’d call them, to be clamped onto the girders for holding the cameras. Actually, we fabricated them here at Bodycote with their help and facilities. That was a great solution for how to deal with the super structure of the plant building,” explains Roger.

“The Sony DF 70 is a good camera for Bodycote because it is a ruggedized dome that’s included with the camera optics and electronics. You can seal it up and it will never come unsealed – it’s just a really good package,” he confirms. “We’re concerned about dust primarily here, but also moisture, humidity, anything that would interfere with the optics. The furnaces are all pretty well cooled by the time they open them up after use, so heat’s not a problem here.”



“We use the Sony SNC 20 camera whenever we have a location for longer shots. With the auto focus, the customer can determine their level zoom; we do not have to go up there and tinker with the lens. We hang it up once and seal up the enclosure and everything else can be done from the ground,” explains Roger. “At Bodycote, we have one of these outside in the back and two inside doing overview shots. They are excellent performance day/night cameras with optical zoom, very well worth their price. Fixed cameras are great for limited area views but these are what you need for variable coverage of large scenes.”

This PTZ camera on the back dock doors of the building starts its patrolling schedule over in the shipping area where trucks come and go, then cycles over to the scrap metal area as a secondary camera (with the fixed camera also set up to watch that area). It then follows the roadway around the building there all the way to where it branches into the main street. It is set to record on motion, so if anyone is driving in here - which they shouldn’t be at night – the camera will stop patrolling and check out what’s happening. Milestone can also send an alert.



### IP video's extra benefits

Production Manager Joe Dyer says: "The surveillance system works for all kinds of things you wouldn't think of: we had an argument between our paperwork and the number of castings for one delivery and could just go back in the video system to count what the actual production was and resolve that issue. We also had one employee who was so lazy he'd breathe through his toenails and not work if he could! I saw him on camera and realized what a drag he was on the team, which affects morale. He also tore up one of our forklifts with his carelessness, and I could show him the evidence in the system - we had to replace the entire rack and cross-beams there. The time and labor, taking all the parts out of that section for the repair, took a couple of days, not to mention the financial costs. That employee is working somewhere else now! We also got very good pictures of several people coming around back to steal the scrap metal. We shared those with the police. One guy got about 1500 pounds of metal in his van! Now we keep our scrap in another yard, locked up."



Daniel Swagger, the Production Manager who uses the Milestone system, adds: "It has been nice to have the system - especially that it applies to other things we didn't think of at first. It's like parking a cop car on the corner then people no longer drive through stop signs without stopping, or slow down to drive the speed limit: the surveillance works preventively just from people knowing it is there. Initially some employees squealed a little bit about the cameras being set up, thinking we were going to put them up in the bathrooms, which of course we didn't. The novelty wore off after a few days and they learned to work with it."

One employee moves his car to park it where it's not supposed to be after Daniel leaves work, and he brought him in to see it and explain that it gets in the way of the delivery trucks.

"Another one likes to complain how hard he has been working on the night shift, and all I have to do is check the system to see when his car came in. We laugh when I call him on his exaggerations, and he'll respond that he must have been thinking of the night before!" laughs Daniel.

He relates a charming story about their IT department that has one fellow who enjoys the surveillance in a less serious way. He really likes the secretary out in the front reception, so every time he calls her on the phone, he also pulls up the camera view on that room so he can see her pretty face and watch her laugh when he jokes with her!

"What a blessing this system has been," concludes Dyer. "In the first few weeks, everyone had it on their screen all the time, playing around with it, because it was exciting and fun, but now we've calmed down and use it as a valuable management tool to improve our business on a daily basis."

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#### About IP Pro Tech Inc.

*IP Pro Tech provides custom IP based CCTV solutions using the latest IP network video technology. The company offers comprehensive data and network design, installation and upgrade services, needs assessment, infrastructure design, and pre-budgeting. IP Pro Tech is a Certified Milestone Partner, qualified through special certification training to implement the top-of-the-line IP video surveillance software from Milestone Systems.*  
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#### About Milestone

*Milestone Systems is the leading developer of open platform IP video management software, according to IMS Research. The XProtect™ products provide support with the widest choice in network video hardware and allow integration with other systems and devices. Milestone solutions are robust and reliable, proven in operation at more than 24,500 customer installations globally, across all industry sectors, and are sold through a qualified channel of partners in 60 countries.* [www.milestonesys.com](http://www.milestonesys.com)

