When facilities change ownership, the critical documentation about the facility: including the process and instrumentation diagrams, hazardous area classification drawings and documentation, plot plants, and material balance information for the processes is often given low priority.

Promoting a common sense approach to conducting hazardous area classifications

One of the big issues regarding managing aging plants that people tend to overlook is the transfer of data as it relates to process safety information. OSHA 1910.119 came into existence in the early 1990s with fourteen (14) elements of process safety information that have to be maintained and, in the US, it's federal law that every facility must comply with OSHA. Managing Aging Plants spoke with James (Jim) E. Johnston, P.E., Principal Process/Safety Engineer at Bath Process Safety Management, on this subject, on which he also presented at the last MAP USA conference in Houston.

By Jolanda Heunen and Gillian Gane

Mr. Johnston tells us that what often happens to plants as they age is that they go through ownership transitions. "I see this all the time," he says, "and when this happens, one thing that tends to get overlooked is the documentation. The critical documentation about the facility including the process and instrumentation diagrams, hazardous area classification drawings and documentation, plot plants, material balance information for the process – all of that is quite often completely forgotten about and the new owners don't have documents that they can refer to and edit so they end up having to start from scratch."

Bath Process Safety Management Company was created in 2012 to more effectively market the common sense approach to conducting hazardous area classifications (electrical area classifications) developed by Mr. Johnston.

He explains how the company operates: "Typically we will get a call from a company when they need help with various aspects of process safety. The first thing I ask for is information, the process safety data documentation information. Quite often, however, we start off with almost nothing which means I will need to visit the facility to begin building the documentation from the ground up. This includes a full survey of the plant to locate all the process equipment and map the entire facility from which we can then develop drawings. Next we begin looking at the process information and linking all of the process safety information together which includes the heat material balance information of every stream that's processed inside the facility." This, says Mr. Johnston, involves all the process data in terms of pressures, flows and temperatures. Having gathered all the information the next step is to develop the P&IDs – the process instrumentation diagrams. Either Bath Process Safety Management, or a consultant employed by them will recreate the necessary process piping and instrumentation diagrams using various available programs. These drawings and documents can then be updated as the plant evolves and changes, as process equipment is added or replaced. But Mr. Johnston says it can be difficult getting people to understand they need to invest in getting the data and all the necessary documentation.

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"At the end of the day, it can be expensive to get someone in to recreate the lost documentation but, when it's done, they have a really good base map of their facility."

Managing change

Mr. Johnston is passionate about maintaining documentation. He has been in the business for well over 25 years and is still trying to get the message across as to the importance of having the documentation maintained as "Evergreen".

"Once the correct documentation is in place, a facility can then use their MOC process to incorporate changes that must be reflected in the documentation, which must constantly be updated. It's great if the documentation is able to be accessed and edited but, if not, it can be scanned," he says. "There are companies now who specialize in this and can even go to a facility and carry out laser scanning to produce equipment drawings which can then be stored on a computer. The technology is out there but it's not something however we've got into yet. The software is available but, in some cases, some of the work products we have seen are a bit questionable and the end users haven't yet developed their skill sets fully. It's vital to record everything and keep it updated, including the structure that holds the equipment, the electrical infrastructure that provides the power to the motors and instrumentation that controls the process and so on. Because it is so specialized, however, we would rather call in a third party to do this and we do have some local companies that we work with. Don't forget, OSHA has the right to enter a facility unannounced to carry out an audit. I can't stress enough the importance of keeping information up to date also taking into account growth and aging," adds Mr. Johnston. "Follow the change processes required by OSHA law and invest in it. I see a lot of facilities that don't have the internal resources available as staff reductions have been made so there is no one in the company who can take on the responsibility of updating these records. We do this work for several of our clients."

"What often happens to plants as they age is that they go through ownership transitions. "I see this all the time," he says, "and when this happens, one thing that tends to get overlooked is the documentation."

Process electrical safety

We asked Mr. Johnston what his day to day role entails and he tells us: "I get very heavily involved in process electri-

Technology has helped enormously over the last thirty years. Nowadays almost everything is computerized.

cal safety. Once a facility has been mapped and we have all the process data we need, then we do what we call hazardous area classification mapping where we actually overlay information onto a site's plot plan and this information becomes the guideline for the installation of electrical equipment throughout the entire facility."

Mr. Johnston continues by explaining that, once all the documents have been created, the client will often ask if there is anything else they might need to do to make the facility safe, or if areas have been found that are not in compliance with the National Electrical Code NFPA70.

What also often happens is that a client will call Bath requesting a visit for an assessment of whether existing electrical equipment has been installed correctly, if the installation practice is safe and the equipment is in compliance with the National Electrical Code. "If we then find out at that visit," Mr. Johnston adds, "that the client doesn't have the necessary hazardous area classification documentation, then we have to go back to the beginning and start from scratch to build the documentation. Only when that has been done are we able to confirm the answers to their questions."

"At the end of the day, it can be expensive to get someone in to recreate the lost documentation but, when it's done, they have a really good base map of their facility."

Complacency can kill: the human factor

Mr. Johnston says that another big issue affecting the way in which facilities operate is that a mass exodus of people appears to be taking place, people who know a facility inside-out are suddenly gone.

"The human factor greatly affects the managing of aging plants and, without a doubt, this will at some point come home to roost unless great care is taken to ensure that the knowledge and the safety culture are passed on and preserved."

Technology has helped enormously over the last thirty years, according to Mr. Johnston who tells us: "It's incredible. When I first came into this industry I was involved in instrumentation systems and control system design at ground level. Nothing at that time was computerized – the technology hadn't yet evolved. There's no question, however, that going away from what we call the old single loop process controller, where you had a transmitter, a control valve and a controller all in one physical loop, each one having its own independent control, has to be an advantage. The new distributive control systems, that came into being in the 1980s, has revolutionized things and you can now make changes to process control systems on the fly both configuration and setpoints.

Mr. Johnston concludes: "All the process data leads us into another factor that I get involved in occasionally and that is safety instrumented systems and safety integrity level. It all becomes a part of what we do. But in summary, I reiterate that the backbone of everything is the information. If this is wrong, everything else is wrong. At the end of the day, it comes down to three words: Information, Interpretation and Execution."

Contact information

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