Yokogawa RAP Best Practices

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We have been implementing our Control of Work software for over 20 years in a variety of industries and in that time, we have encountered many different types of organizations and many different ways of controlling work safely.

From all of the companies that we've seen implement RAP, we have identified a number of best practices. We are calling them RAP Insights and we will be highlighting these at various points during the series. They are not intended to give you cause to fundamentally redesign your entire Control of Work processes. Rather they are aimed at highlighting the small changes that can be made; changes that we believe will dramatically improve the efficiency and safety of your processes.

However, even before we start examining the Control of Work processes in detail, it is fair to say that one practice stands out above all others in all Control of Work elements. That is risk assessment. By this, we mean not just the one-off formal process that we all do

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– important as it is - but when it is applied across the entire Control of Work process. We are not suggesting that identifying risk as you carry out each of the elements will replace the formal process of risk assessment. Far from it, we see this as a fundamental part of the entire process. What is true however, is that identifying risks as each element is encountered in the Control of Work workflow, greatly enhances and augments the entire process leading to much safer results. So therefore, this is our
RAP Insights # 1 – 'always have an eye for risk'.

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It's not for nothing that RAP stands for the Risk Assessment Process, it is our ethos and our motivation and we have made this practice the fundamental principle that underpins all of the products and services we deliver. Over the course of these discussion documents, we will see how these RAP Insights reinforce our central tenets and greatly enhance your performance.

The following article concerns the importance of correctly planning. We consider this as the first step of Control of Work and it could be said that this is the most important - decisions taken here will cascade down into the rest of the process and influence later controls. The other articles in the series are: Risk Assessment, Establishing Controls, Preparation, Issue of Safety Documentation (the Permit to Work), Carrying out the Work and Completion (including status communication and reporting). The final piece will be on the one thing that underpins all of these – People.

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Planning for Safety

The Control of Work may typically start with the planning process, or at least the recognition that a piece of work needs to be done. There are many tools available for planning and scheduling the work. These, quite rightly concern themselves with the logistics of ensuring that the equipment can be worked on, that the materials required for repair are available and that there is sufficient resource available to do it. This article is concerned with how we might build on that plan in order to identify potential risks well up front, so that suitable adjustment may mitigate against or even remove them.

There are a number of elements that the planner can consider up-front, which can greatly improve the chances of accident-free maintenance work being carried out later. Most of these are common sense, but are worth highlighting insofar as taken collectively, they can impart a good sense of what an ideal workplace/environment should look like.

Other Activities

It is obvious that the busier a work site is, then the more chance there is of accident or incident occurring through the sheer pressure of activity. It makes sense therefore to try and ensure that not too many activities are scheduled to take place in any one area over any one particular time period. The planner should consider the types and descriptions of work that they have programmed. They should endeavour to try and understand the nature of them so that mutually exclusive or conflicting pieces of work are not planned at the same time. Such exclusivity could involve, say insulation being stripped off pipe work in an overhead pipe rack (which has a high potential for material to fall), whilst another job is in progress below. Similarly, it is not advisable to carry out spray-painting or grit blasting, for example, whilst sensitive equipment is being taken apart near-by.

In RAP, the potential for activities to clash is identified not at the post-planning stage but during risk assessment. However, it is none-the-less effective in identifying these issues before the work commences. Take for example the icons shown below. RAP classifies all tasks in terms of these icons and collectively, they represent 100% of the maintenance workplace. Therefore, if two icons are selected, on the same task or on adjacent tasks, then RAP can be configured to have the icons 'clash'. In the instance shown below, someone is welding in or near someone working in a confined space. This asks all sorts of questions about potential conflicts; from the storage of gas bottles, to the potential presence of inert atmospheres through to the potential for fume to be present. These can be brought to the attention of the planner at the planning stage and any potential conflict completely ruled out

rather than leaving it for the Permit Issue stage. workforce and the environment, there are additionally some simple pragmatic choices to take into account. One is that an organization will be at a disadvantage in selling its products if its reputation is poor. Also, recruiting and retaining the employees will be difficult if they fear for their safety and sometimes even their lives. In addition to this, the costs involved in resolving situations and legal action, and the time consumed in doing so are now astronomical. Take for instance the Deepwater Horizon oil spill of 2010, when 11 people were killed, 17 injured in arguably the largest marine oil spill in the history of the petroleum industry. BP agreed to pay $18.7 billion in fines with many more claims outstanding - the largest corporate settlement in US history.

Of course, this is not limited to these particular tools and activities. Breaking Containment, radiography and spray painting are ones that immediately come to mind – all icons in RAP can be made to 'Clash' or warn. Mitigating the negative effect of other planned work is
RAP Insights # 2 – 'watch what the other guy's doing'

Timing

Timing is important for a number of reasons, not just in avoiding conflicting work and not just for economic reasons The planner should always try and ensure that the work is conducted in as quick and efficient manner as possible. The longer a job takes, the more people working in the area are exposed to potentially unsafe circumstances and the more potential there is for something to go wrong. The use of timers on the work certificates should therefore be considered.

Scope of Work

It is important to make sure that the scope of work is clear and concise and that it covers all activities and tools to be used as well as the conditions that will pertain. It is also important to breakdown the work into its component parts so that the status of the job execution is clear at all times and that all are aware of when their role starts and finishes. This not only makes for a safer job but dramatically improves efficiencies as well.

Example of an inadequate job breakdown

A large heat exchanger was to be refurbished. It involved the removal of the ends and pulling of the tube bundle, inspection, cleaning, further inspection and subsequent repairs. The planner however, being naturally concerned about the 'nuts and bolts' of the job, only identified the mechanical tasks and omitted the inspections from the plan. These involved entry into the tube shell and all of the necessary risk assessment that this involved. Since they had not been planned, all of this was carried out at the last minute, severely delaying both the cleaning and the repairs and incurring significantly greater cost as crews were kept idle.

Not Enough control

An oil tanker was in a 'dry-dock' for repairs. The ship had been emptied of oil, a cursory inspection had revealed some minor corrosion in the holds and repairs were needed to be carried out. The Engineer in charge of the maintenance work arranged for specialist cleaners to remove flammable oil residues from the holds, and also a team of welders to carry out the necessary repairs. Three permits were written. One 'entry' permit allowing personnel into the vessel's holds, a cleaning permit, and a 'hot work' permit for the welding. The cleaners were instructed to carry out the cleaning on day 1 of the repair and the welders were then to commence on day 2. Unfortunately, not all the cleaning could be carried out on the first day and the cleaners had to keep working on day 2. They were still there when the welding crew arrived for their maintenance work. They had been in the hold for only 20 minutes when an explosion occurred. Seven people were killed. Although the job had been broken down into its component parts, not enough control was placed on the order in which the work was done - resulting in 2 mutually exclusive tasks being carried out at the same time. A terrible tragedy therefore unfolded – one that could have been avoided by better control of work groups and a linking of permits such that RAP offers (where permits can be made to be done in series i.e. one permit signed off before the next one is issued).

Over-Burdening the Specialists

Another aspect to look at is that of similar types of work taking place at the same time, especially if they are of 'high hazard'. A frequent example is for work involving entry into a confined space. In almost all high-hazard industries nowadays, such work would involve the preparation of an emergency rescue plan before the work could commence. This plan would feature the use of special equipment, perhaps including breathing apparatus, and would involve personnel from specialist organizations such as the Fire Department. It makes good sense therefore not to initiate so much of this type of work at the one time. The overall commitment of these specialists would be overwhelmed if the worst case was to happen, and they were required to perform many rescues at once. In a similar way, the situation arising as above is true for work involving road closures. Let us suppose that a large mobile crane is being positioned for carrying out a complex lift over working equipment, and that this involves closing a road because the crane is blocking the access. You would still want to be sure that emergency access is available to the rescue service should things go wrong. In addition, other work should be planned away from the area so that the chances of the emergency access being required was minimised.

Planning Turnarounds

In Turnarounds it is entirely possible that some hazards may be exacerbated (the busy period and the over-burdening from before) but others may be diminished (battery limit isolations, gas free etc.). This will be the topic for a separate discussion.

In conclusion, it is well worth establishing that a well-planned job is a great step in the direction of having a safe job. Although you may get away with poor planning for some of the time, you are running greater risks if you don't plan well. Also, when carrying out your planning, make sure that at least some part of the process is carried out in conjunction with Operations personnel; make sure all necessary tasks are considered and that important hazards are identified early on.

In Conclusion

It is well worth establishing that a well-planned job is a great step in the direction of having a safe job. Although you may get away with poor planning for some of the time, you are running greater risks if you don't plan well. Also, when carrying out your planning, make sure that at least some part of the process is carried out in conjunction with Operations personnel; make sure all necessary tasks are considered and that important hazards are identified early on.

Linking your RAP electronic permit to your planning/scheduling tool will ensure that you anticipate likely hazards before the event, that you can put in place controls to avoid/mitigate them and that the job progresses smoothly and efficiently.