Importance of Welding Procedure Software

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Welding is an ocean of substance, a technique without which joining the metals stand nowhere. This technique is the backbone of petrochemical, oil & gas, refinery and other many industries, when it comes to assemble, construct, fabricate, erect and repair the metal through joining. Be it a new installation or an operating unit, welding stands as a core of most of the activities. Currently, around the world, as an estimate, 70% of the major project installations depend upon welding activities controlling the project timelines, project planning and inspection activities. Quality control and assurance personnel spend most of their time checking the welding works, their progress, inspection and final approvals. To summarize, when we talk about joining of metals and to build something meaningful, welding gives us the power to do that and depend on this wonderful technique.

Welders, welding supervisors, inspectors, maintenance engineers and inspection engineers cannot move forward with welding of any pressurized or non-pressurized part of any component till they have a welding procedure duly qualified with qualification records available and a welding performance qualification for the welder, the guy to do the job. These two important documents complete the documentation requirement to proceed with any welding activity. There is no third required if these two are valid, up to date, certified or signed-off by the concerned inspection engineer /authority in place.

Fig. 1: Two components of welding documentation

In most of the companies at all levels, the requirement of this documentation is known. Welding procedures are written then they are qualified as per acceptable codes be it ASME, API, AWS or any

other. Qualified welding procedure, its qualification records are then kept for future use and reference. Similarly, an exercise is done with the welders as well. There are sessions conducted when welders are called upon to testify their skills. That documentation is also kept for each welder and is referenced frequently to make sure the welding is being done by the right welder.

Referencing an approved and qualified welding procedure or welding performance record is the main objective of this article. How frequent these documents are referred and by which means. First looking at the number of welding procedures and the welding performance records would tell us that how referencing can be managed. Few welding procedures can be just placed in hard copies in a file as well as in soft copies over a link and can be referred easily. However, taking the case of an operating plant having piping metallurgies ranging from carbon steel, low alloys, corrosion-resistant alloys (CRAs) including stainless steel, nickel alloys, titanium and special alloys would make referencing a little complex where in all these major groups, different material classes and grades are also being used. Any petrochemical plant can easily have all these materials. Their each process system can have multiple metallurgies to deal with the process conditions. Carbon steel will serve well with condensate, low pressure steam but as the temperature and pressure goes up even the steam needs certain low alloys.

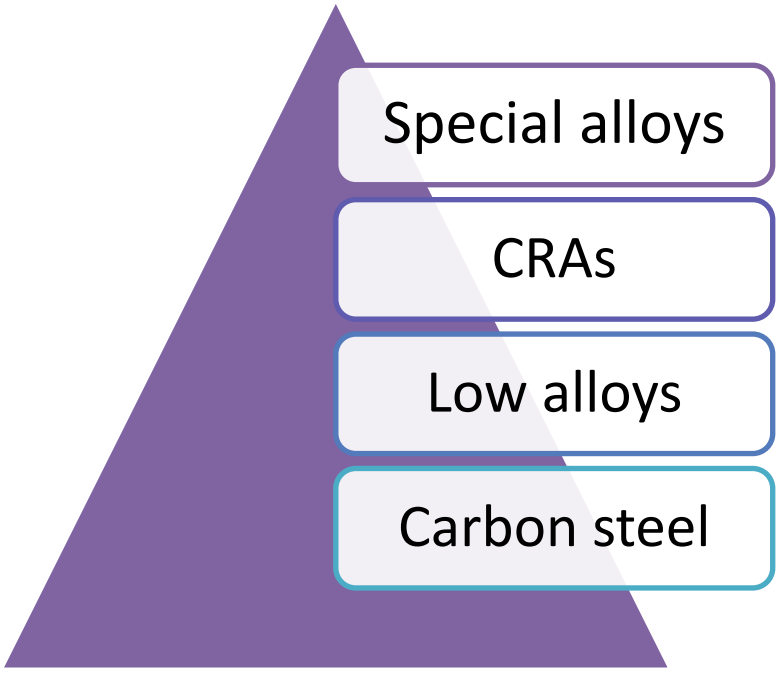

Fig. 2: Pyramid of metallurgies

Now any leakage in these piping systems with variety of metallurgies would require welding being the temporary repair sometimes and permanent repair as well. As of now, this technique hasn't any alternate especially for high pressure, high temperature process piping repairs. Now a welding procedure, welder and other associated hardware is required to address the leakage through welding repair. Welders can be arranged on a single call, Operations will be handing over the line as soon as possible to address the loss of containment through positive isolation. All set, ready! Where is the welding procedure and the welder who is ready to do the weld is qualified? These are must to have questions first by maintenance team themselves and then the Inspection team involved in suggesting the repair methodology. Getting the right records out and use them accordingly would have this repair a smooth sailing. But where to get the records, files, intranet etc.

Here comes the need of a welding procedure software which upon providing the materials to be joined, welding technique should come up with the approved and qualified welding procedure and records of associated welders available with the company qualified to use this welding procedure and do the welding. Finish! Through this, Maintenance and Inspection personnel would be at ease

in getting the right records out, within time and providing the welder with all the set parameters in performing the welding, finishing the job and proceeding for inspection and testing of the weld joint.

There are multiple welding procedure software available in the market which helps you with many good things. In my opinion the basic requirements from a welding procedure software should be the following:

Containing a database of material
Containing a database of fillers /electrodes as per most frequently used codes
A mechanism to check if a written welding procedure complies the given code requirements
Storing of qualified welding procedure
Storing of qualified welding performance records for welders
Providing user with the suggested welding fillers for certain combination of materials to be welded
Providing user with the suggested other essential variable as per code requirements

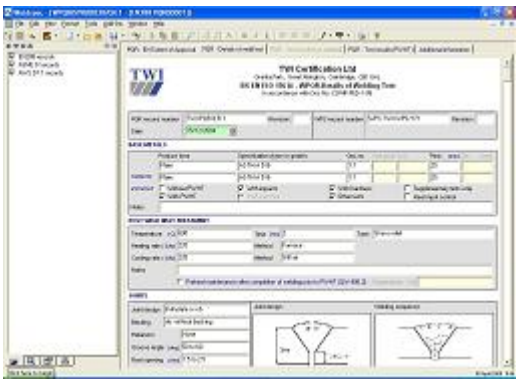

Fig. 3: A sample welding procedure software

These seven requirements would make any welding procedure software a success and a big time saver through management of welding procedures especially in industries where engineers and personnel are dealing with a pyramid of metallurgies. Data and time management would provide financial benefits as well which are of primary concerns when implementing a new system in place.

Welding software can eliminate following risks involved during a welding process:

Referring to a wrong welding procedure
Appointing a unqualified welder for a welding job
Not following the right parameters during welding

Conclusively, in this modern World and with so much possible with technology, having a welding software containing above mentioned seven qualities at your desk would provide you a boom in your day-to-day welding activities be you a welding supervisor, maintenance supervisor, inspector or an inspection engineer.

Bio of Author

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Working as an Inspection Engineer with ADNOC Gas Processing, Ashfaq has got 13 years of experience in inspection, corrosion, material selection for pressure equipment and piping in Ammonia-Urea, petrochemical and gas processing complexes. He can be contacted at his email address ashfaqanwer@gmail.com