Inspector Responsibilities

CWIs must understand their role in the assignments they undertake before diligently performing those duties

BY NEAL CHAPMAN

You've passed the test. You've received your certificate, wallet card, and stamp. You're now officially an AWS Certified Welding Inspector (CWI). But, as such, what is your primary responsibility?

The **CWI** is accountable **to the public for performing visual weld inspections**.

The above statement can be accurately made by inserting a few words gleaned from the AWS standards into the online Encarta Dictionary's first definition of "responsibility," which reads as follows:

- Accountability: the state, fact, or position of being accountable to somebody or for something

However, there's a second part to that definition of responsibility as well:

- Blame: the blame for something that has happened.

The first meaning — accountability — is easily related to a CWI's responsibilities and duties. And if those responsibilities and duties are carried out in their entirety and performed competently, the CWI should avoid the latter.

What the AWS Standards Have to Say

What can we learn about a welding inspector's responsibilities from the AWS standards?

AWS QC1, *Standard for AWS Certification of Welding Inspectors*, Paragraph 11.2 in part states:

"**Responsibility to the Public.** The SCWI, CWI, and CAWI shall act to preserve the health and well being of the public by performing duties required of welding inspection in a conscientious and impartial manner to the full extent of the inspector(s) moral and civic responsibility and qualification."

AWS B5.1, *Specification for the Qualification of Welding Inspectors*, states in paragraph 4.1 that the **employer** is responsible for defining the welding inspector's duties. In addition, the standard provides a detailed listing of inspection tasks relevant to each level of certification in Table 1.

AWS B5.1, Table 1, is a thorough job analysis providing a brief description of each task required and the associated level of qualification needed to do it. The entire document is available free of charge at *www.aws.org/w/a/certification/CWI*. The table, which is included here, should be consulted as you determine what attributes are required during an examination and which level of certification is appropriate for each task.

Levels of Qualification

It is the responsibility of all CWIs to first understand their role in the assignments they undertake and then to diligently perform their assigned duties with strict attention to detail.

Welding literally holds our modern world together by providing structural integrity. Buildings and bridges are obvious examples of this. Transportation vehicles of all sorts, from bicycles to bullet trains, as well as systems that generate, store, and transport fuel and energy of all types depend on sound welds. These applications all require welds to provide structural integrity so the components meet their intended design function, and visual inspection is the most common method of examination performed to ensure that they do. Some of these welded applications are part of complex assemblies that may require the services of several inspectors and involve numerous welds.

The lead inspector, who may be an AWS Senior Certified Welding Inspector (SCWI), might not perform any examinations on a large project but instead set up the drawings that ensure all welds are inspected using the specified code acceptance criteria and that any nonconformance(s) noted by other inspectors are reviewed and accepted by the design engineer or are corrected.

On such a job, several CWIs may be assigned to various tasks and one CWI might only be asked to perform examinations of quality and sizing. If that assigned CWI does only a limited task, his or her reports should clearly state those limitations. In many projects the inspection reports and associated documents are provided as part of the initial planning. In such a case where a limited inspection is being performed after the work is complete, the CWI may not have had the opportunity to witness all the work before the assignment and therefore might not have seen what electrodes were used or observed the weather conditions that existed during fabrication. In this specific instance, a report could be annotated to state something like "only dimensional and quality examinations were performed this date." In such cases where inspection duties are

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This article is intended to be a discussion of the general theme of "responsibilities" and certain aspects stated are the author's opinion only.

Table 1 — Welding Inspection Capabilities Based on Qualification Level

Knowledge and Skills	AWI	WI	SWI
(1) prepare reports	X	X	X
(2) communicate effectively orally and written	X	X	X
(3) understand the fundamentals of SMAW, SAW, OFW, RW, GTAW, FCAW, GMAW, PAW, SW, ESW and thermal spraying, soldering, mechanical cutting, thermal cutting/gouging, brazing/braze welding	X	X	X
(4) understand the fundamentals of VT, MT, AET, UT, PT, ET, RT, LT, quality procedures and quality audits/surveillance	X	X	X
(5) understand the fundamentals of welding metallurgy		X	X
(6) understand welding symbols and drawings	X	X	X
(7) interpret drawings		X	X
Standards	AWI	WI	SWI
(1) verify base material compliance	X	X	X
(2) verify filler metal compliance	X	X	X
(3) verify filler metal storage/handling compliance	X	X	X
(4) verify inspection records compliance	X	X	X
(5) verify proper documentation compliance	X	X	X
(6) verify base material and filler metal compatibility		X	X
(7) certify documented results compliance		X	X
(8) verify procedure qualification records compliance		X	X
(9) verify welding procedure compliance		X	X
(10) verify NDE procedures compliance		X	X
Procedure Qualification	AWI	WI	SWI
(1) verify welding equipment appropriateness	X	X	X
(2) verify edge preparation compliance	X	X	X
(3) verify joint geometry compliance	X	X	X
(4) witness procedure qualification		X	X
(5) verify welding procedure qualification compliance		X	X
(6) review and approve welding procedures		X	X
(7) develop welding procedures			X
Performance Qualification	AWI	WI	SWI
(1) witness welder performance qualification		X	X
(2) verify welder qualification compliance		X	X
(3) verify welder qualification records compliance		X	X
(4) request welder performance requalification		X	X
Production	AWI	WI	SWI
(1) verify welder qualification appropriateness		X	X
(2) verify production welding compliance		X	X
(3) verify personnel qualifications		X	X
Inspection	AWI	WI	SWI
(1) perform visual examinations	X	X	X
(2) verify examination procedure compliance		X	X
(3) review examination results compliance		X	X
(4) develop visual inspection procedures (before, during, and after welding		X	X
(5) provide NDE inspection planning and scheduling (before, during, and after a project)		X	X
(6) review welding inspection reports		X	X
(7) verify implementation of nondestructive and destructive evaluation methods		X	X
(8) prepare visual inspection requirements			X
(9) prepare NDE requirements			X
(10) report investigation results of quality inspection disputes			X
(11) prepare destructive testing requirements			X
Safety	AWI	WI	SWI
(1) verify safety requirements compliance	X	X	X
(2) develop safety procedures and policies			X
Quality Assurance	AWI	WI	SWI
(1) perform audits and surveillance		X	X
(2) develop quality assurance plans			X
(3) prepare base material control requirements			X
(4) prepare weld consumable control requirements			X
(5) prepare audit and surveillance plans			X
(6) prepare documentation control requirements			X
Project Management	AWI	WI	SWI
(1) review contract requirements		X	X
(2) review vendor proposal compliance		X	X
(3) prepare weld inspection bid specifications			X
(4) prepare purchase specifications			X
(5) determine vendor capacity and capability			X
(6) select vendor			X
Training	AWI	WI	SWI
(1) develop and provide a training program for the AWI		X	X
(2) develop visual inspection training		X	X
(3) verify implementation of visual inspection training		X	X
(4) develop and provide a training program for the WI			X
(5) provide technical leadership for welding inspectors			X
(6) develop quality assurance training program			X
(7) verify implementation of quality assurance training			X
(8) provide guidance and direction to inspectors for maintaining and upgrading their individual qualifications			X
Evaluation	AWI	WI	SWI
(1) evaluate AWIs performance		X	X
(2) evaluate WIs performance			X
(3) perform inspection results trend analysis			X

split up, it is important to accurately report such limiting descriptions on the examination documents. Understanding how the examinations you are performing and documenting fit into the overall project is an important attribute for which the inspector is responsible.

The role of an AWS Certified Associate Welding Inspector (CAWI) is limited and those individuals may only perform inspections under the direct supervision of a CWI or SCWI. This direct supervision is clearly defined in both AWS QC1 and B5.1. In the scenario above, a CAWI may perform inspections and record the results when a supervising CWI is present with visual and verbal contact.

A Real-Life Example

At a nuclear power plant, all employees are trained from day one that if any personnel or nuclear safety concerns are observed it is their responsibility — not their option — to report those concerns up through the company chain of command. Employees also have the option of reporting their concerns to the U.S. Nuclear Regulatory Commission or Occupational Safety and Health Administration.

This responsiblity is similar to the military requirement that it is a soldier's responsibility to report infractions of regulations. If soldiers are found to have known about but did not report the infractions, they are viewed as being as guilty as those who actually committed the infractions. It is understood that this may sound like a *Pollyanna* perspective, but it is grounded in the same basic concept that following these rules protects the public.

The following example is loosely based on a real case and is meant to illustrate the "protect the public" doctrine and how important it is. Remember as you read this that as CWIs we are accountable to the following:

1. The public, who ride the elevators, drive over the bridges, and live near the plants we inspect;

2. Our employers, who pay us to examine the welds;

3. Our peers, who count on us to keep our profession respected by the public and our employers.

A large prefabricated piping job was specified to meet ASME B31.1. By contract, all welds required visual examinations to be performed in accordance with ASME B31.1 by individuals who were current AWS CWIs.

Two CWIs employed by the power plant were assigned to perform preliminary reviews and inspections as the owner's representatives. If they determined that the fabricator was performing satisfactorily to the contract requirements, then they would release the job for completion. The owner representative's CWIs reviewed the production and inspection plans, welder qualifications, fabricator CWI's certifications, WPSs and PQRs, and general welding standards, and ensured the filler metal control processes were in place.

Once these reviews were completed satisfactorily, the contract was allowed to proceed. The owner representative's CWIs stayed and inspected the first 5% of welds. No discrepancies were noted and detailed inspection reports were generated by those CWIs documenting which elements of the fabricator's program were reviewed and which welds were inspected.

The owner representative's CWIs returned to their plant with a good feeling that the job would be fabricated correctly. This was based on their initial findings and the fact that the contractor had two employees who were CWIs.

That feeling was upset a few months later when the owner's warehouse personnel notified the CWIs to hurry and look at some just-received pipe. Indeed, the majority of welds in those pipes were visually "unsatisfactory" even to the untrained eyes of the truck driver. The owner representative's CWIs inspected the welds upon receipt and documented that unsatisfactory conditions existed in nearly all the welds except in the 5% that had been previously inspected.

Okay, so who was responsible — the owner CWIs, fabricator CWIs, fabricator, or owner?

The fabricator, the employer of the CWIs, was responsible. The welds were repaired and reexamined, and all costs were charged to the fabricator's account.

The owner's representative asked that the fabricator pursue actions with the AWS against what were considered unethical acts by both of the CWIs employed by the fabricator. The fabricator refused to place sanctions against the inspectors within their own company and chose not to report the unauthorized practice to AWS.

It is the author's opinion that all responsible CWIs should report unethical acts by other CWIs of which we have firsthand knowledge. It must be noted that this is a personal opinion that is not specifically detailed in either AWS standard noted in this article. This statement should not be misconstrued to mean that all disagreements amongst CWIs should lead to an ethics allegation. If one inspector sees $\frac{3}{16}$ in. on a scale and another $\frac{1}{4}$ in., that is not an unauthorized practice. However, if an inspector signs for work that was never inspected, that is an unauthorized practice. That type of unauthorized practice can result in failures that could lead to the public being harmed. Any CWI observed committing an unauthorized practice such as that must be identified and dealt with appropriately.

The contention with regard to this scenario is that the fabricator CWIs assigned to the job either did not perform the inspections and signed off that they did or were unfamiliar with piping welds and should not have accepted the assignment. The first is most likely as the welds were grossly unacceptable, but in either case an unauthorized practice was identified in accordance with QC1 Section 11. This particular case was well documented with photographs and independent inspections and resulted in action by AWS against the fabricator's CWIs in accordance with AWS QC9, *Administrative Procedures for Alleged Violations of AWS Certification Programs*.

There was no joy then, and there is none now, in telling this story. The only good that came from this situation is that the detailed inspection reports protected the owner company, and the public was protected because the American Welding Society acted appropriately when provided with credible evidence regarding CWI personnel who had violated the Code of Ethics.

Conclusion

All Certified Welding Inspectors are challenged to review each new job with a questioning attitude and ask themselves the following questions.

1. What I am responsible for on this job, and how will I document that I met those responsibilities?

2. Who am I accountable to and for what?

No one can tell you the answers to question 1, but a review of the second paragraph of this article will give you the answer to question 2.❖