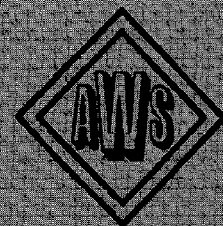


CHAPTER 12:**INSPECTION REPORTS****Introduction**

Reporting observations and decisions is the final step for a welding inspector. Many people are waiting for them. The welding inspector may feel that he/she is only responsible to his/her employer, but the employer has responsibilities to many related organizations, be they the customer, fabricator or erector.

Report Contents

A good report begins with good record keeping. Good records not only protect the welding inspector; they also help him/her follow a policy of uniform standards.

The inspection report must be clear and concise so that others will have no difficulty understanding the decisions reached, even months later. Though concise, it must be complete enough to be clear to a reader unfamiliar with the product inspected.

The report must be complete, accurate and have the appropriate signatures. All formal reports and data forms required by the governing standard or code should be completed in ink. Again, it should be noted that erasures are not permitted in these legal documents. Errors are to be crossed through with a single line and not erased. When such corrections are made, they should be accompanied by the inspector's initials and the date of the change. In that way, there will be no question as to who made the change and when it occurred.

Reports must include references to the many other reports that the welding inspector sees and uses as

tools in his own inspection process. Among those more commonly used are the following:

- Surveillance Reports
- Certified Material Test Reports
- Quality Reports
- Qualification Records
- Progress Reports
- Production Schedules

The welding inspector of any category should keep a set of records for each contract under surveillance, detailing every inspection made and every joint in the vessel or assembly. For a small job, these records may be contained in a single file, while larger jobs may require that the records be separated into various files. This selection is often a matter of personal preference; however, some codes will stipulate how this information should be organized and maintained. The important feature is to assure that the system used is easily understood by all appropriate individuals, not just the inspector.

Report Format

The inspector, working in accordance with a national code or standard, monitors the quality assurance program of the fabrication through his review of quality reports, qualification records, certificates of compliance, and records of examinations and tests. The inspector for the fabricator is part of the quality control organization and thus assists directly in preparing reports required by the quality assurance program. The governing code or standard will suggest a format for an inspection report.

Structural Welding Code (AWS D1.1)

Suggested forms for an in-house inspector's reports are printed in the Appendix E of AWS D1.1, *Structural Welding Code- Steel*. Copies of these forms are included in the Appendix. They include forms for recording procedure qualifications and welder and welding operator qualifications. Also included are laboratory report forms for three categories of nondestructive examination data.

Variations in the suggested forms are permissible, as long as all of the necessary information is provided. The AWS procedure qualification forms include versions for prequalified welding procedures, welding procedures qualified by actual testing and welding procedures for electroslag and electrogas welding.

ASME Boiler and Pressure Vessel Code

The ASME Boiler and Pressure Vessel Code contains a number of Data Report Forms required of the designer, the owner, the manufacturer, and the fabricator of any vessel covered by this code. Under this code, each of these parties must have a quality assurance program (documented in a Quality Assurance Manual) that details manufacturing processes, job titles and responsibilities for inspection. The designated inspector may be expected to complete the Data Report Forms for his employer, but he will not be able to sign them unless authorized.

The ASME Code places all responsibility on the manufacturer or installer. Only the Authorized Inspector may place his signature or initials and date on check lists of items he has witnessed and Data Reports. In practice, however, the in-house inspector assembles all of these reports and verifies compliance by the manufacturer.

Form N-1 for nuclear vessels is a typical ASME report. It lists the names of the manufacturer and the purchaser; the type and kind of vessel; dimensions of shell, seams, heads, jacket closure, tube sheets, and tubes; dimensions of any inner chambers (shells, seams, heads); the design

pressure of jackets and inner chambers, with test data on impact resistance and pressure tests; data, when applicable, on safety valve outlets, nozzles, inspection manholes, other openings and supports; remarks-, and a certification of design covering the design specifications and stress analysis report (each certified by a professional engineer). The Certificate of Field Inspection (or Field Assembly Inspection) completes this form.

In addition to these data report forms, the welding inspector will also be asked to review and verify information contained on the various forms related to welding procedure and welder qualification. These include: the Welding Procedure Specification (WPS), the Procedure Qualification Record (PQR) and the Performance Qualification Record.

API Report Forms

A typical API form for reporting qualification of procedures or welders for pipeline welding can be found in the Appendix. Although different than those for AWS or ASME, much of the information required is similar, if not identical.

Multiple Inspection: One inspector's reports may well duplicate reports by some of the other inspectors, but that is the nature of the surveillance of major weldments. An illustrative example is the multiple reporting given to the radiograph of a weld.

Many radiographs are evaluated by up to five different people, each of whom makes a record of his contribution to the inspection. The report form for radiographic examination might well be used by each of them. Those individuals who might become involved in the radiographic evaluation for a typical scenario are listed below:

- 1) The *technician* exposes the film and develops it, and records the identification of the weld and the exposure details.

- 2) The *examiner* or *technician Level I* or *II* in the radiographic department examines the film and reports his interpretation.
- 3) The *SNT-TC-1A examiner* for the contractor reviews the film for acceptance.
- 4) The *customer's welding inspector* examines the film and makes his own evaluation.
- 5) The *ASME Authorized Inspector* (in the employ of one of the insurance companies, or a jurisdiction such as a state) reviews the film and the report for concurrence and acceptance.

Unstructured Reports

Up to now the major emphasis has been on the more formal reports required by the code, standard or specification. However, unstructured reports will be often required of a welding inspector. This is especially true of workmanship opinions. Comments on the visual examination and repair of plate cut edges, on shrinkage and distortion, on dimensional tolerances such as straightness and flatness, camber, warpage and tilt, on the fit and straightness of intermediate stiffeners and bearing stiffeners, on weld profiles, and on the repair of unacceptable welds and difficulties that occurred - all require individual reporting. Such notes are not readily tabulated unless you keep accurate and complete records.

The formality of an unstructured report will vary with the welding inspector's responsibility. An inspector in a small company will be more informal in his reports than will a state inspector. Copies of the reports and attached records should go to all who are entitled to receive them. The inspector should keep a copy for his own files. Even while performing inspections on non-code work, an inspector should keep a proper record of his work. At a minimum, this could be in the form of a complete set of notes.

Report Check List

- After writing the report, the following questions should be asked as a check on the quality of the report:
- Are all the report data forms required by the governing code, standard or specification complete? Accurate? Signed?
- Are all supporting forms, reports and data included or properly referenced?
- Are the facts stated clearly and concisely?
- Can the reader reach the same logical conclusions or make sound decisions from the facts and data in the report today. In two months? In six months?
- Does the overall organization of the report present a total picture to the reader?
- Does the report maintain a logical sequence? For example, does it follow the fabrication process? Procedure inspection? Acceptance process?
- Have the purpose and objectives of the reports been attained?

Conclusion

One should be commended for undertaking a career in the field of inspection. Welding inspection is an important field. It is exciting and demanding. It takes a special kind of person to select this kind of work. Good luck in these future activities.

REVIEW**CHAPTER 12
INSPECTION REPORTS**

- Q12-1** Once inspections are completed, what important aspect of the inspector's job must be accomplished?
- a. tell the foreman that the weld is acceptable
 - b. tell his supervisor that the inspection is complete
 - c. fill out an inspection report detailing his findings
 - d. all of the above
 - e. none of the above
- Q12-2** Which of the following is not normally required of inspection reports?
- a. inspector's signature
 - b. an indication of only those parts which were acceptable
 - c. they should be clear and concise
 - d. they should be filled out in ink
 - e. none of the above
- Q12-3** What authorship is attached to inspection report forms?
- a. the inspector's signature
 - b. the welder's signature
 - c. the welding supervisor's signature
 - d. Forms are anonymously presented.
 - e. Forms are not signed.
- Q12-4** What handy report forms are available from AWS?
- a. Appendix E of AWS D1.1
 - b. Appendix I of AWS D1.1
 - c. Appendix O of AWS D1.1
 - d. AWS QC 1
 - e. ASME N-1 Form

- Q12-5** You have made a numerical mistake on a report form. How should it be corrected?
- a. An experienced inspector will use a pencil so such errors can be erased and corrected.
 - b. As an inspector-in-training, such errors need not be corrected.
 - c. To keep the report legal and credible, the error should be crossed out and the correction added adjacent to the error and noted complete with initials and date of correction.
 - d. The report must be completely rewritten.
 - e. none of the above
- Q12-6** How are errors in writing corrected in written reports?
- a. crossed out
 - b. erased with an ink eraser
 - c. Entire page must be rewritten.
 - d. crossed out, corrected, initialed, and dated
 - e. none of the above
- Q12-7** Who is authorized to sign off ASME data report forms?
- a. the authorized inspector who performed inspection
 - b. an authorized keeper of the code stamp
 - c. an officer or manager of the company
 - d. any of the above
 - e. both a and b above
- Q12-8** How are opinions on workmanship or suggestions for repair usually reported'?
- a. Comments are written in chalk on the work.
 - b. by unstructured reports
 - c. Provisions for such comments are contained in structured reports.
 - d. Inspectors are forbidden to offer such comments.
 - e. none of the above