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RECORD OF REVISIONS

Rev	Date	Description	POC	RM
0	10/1/09	Initial issue. Supersedes Volume 1, GWS 1-11.	Kelly Bingham, <i>ES-DE</i>	Larry Goen, <i>CENG-OFF</i>
1	11/21/13	Added J2 to vision requirements	David Bingham, <i>ES-EPD</i>	Larry Goen, <i>ES-DO</i>

Contact the Welding Standards POC for upkeep, interpretation, and variance issues.

WIGN 6-01	Welding POC and Committee
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This document is online at <http://engstandards.lanl.gov>

WIGN 6-01 WELDING INSPECTOR QUALIFICATION

1.0 PURPOSE AND SCOPE

- A. The purpose of this procedure is to establish the qualification and certification requirements for personnel performing visual welding (VT) inspections of welding in support of the LANL Welding Program.
- B. The scope of this procedure applies to personnel conducting VT under the LANL Welding Program, including subcontractor personnel when invoked by specification or contract.

2.0 REFERENCES

1. LANL [P330-8](#), Inspection and Test for Acceptance
2. GWS 1-01, Introduction and Scope
3. GWS 1-02, Administrative Control of Welding & Brazing
4. ESM Chapter 16, IBC Program, Section IBC-TIA
5. Applicable codes and standards as specified in the LANL Engineering Standards Manual (ESM) and Master Specifications or other specified programmatic requirements, including NDE procedures (e.g., ITM-1306-NDE series)

3.0 ACRONYMS AND DEFINITIONS

Acronym / Term	Description
CM-CE	Construction Management – Construction Engineering
ET	Eddy current
ES	Engineering Services Division
GWS	General Welding Standards
MT	Magnetic particle
NDE	Non-destructive examinations; an examination process conducted to detect internal or surface defects in materials using techniques that do not damage or destroy the item being tested. The most common types of NDE are RT, UT, MT, PT, and ET methods. Depending on the applicable code, VT may also require control as an NDE process in accordance with this procedure.
PT	Liquid penetrant
RT	Radiography
UT	Ultrasonic
VT	Visual Examination
WPA	Welding Program Administrator (LANL)

4.0 GENERAL

4.1 Responsibilities

- A. The **LANL Welding Program Administrator (WPA)** is responsible for certification and/or approval of welding inspection personnel at LANL in accordance with procedure.
- B. The **LANL Project / Program Managers and facility managers** are responsible for coordination of welding inspections conducted in support of assigned projects, in accordance with the Administrative Control of Welding section (GWS 1-02) of this program.
- C. **Subcontractor welding inspection personnel** must be qualified and certified in accordance with this procedure or an equivalent procedure approved by the LANL WPA when invoked by specification or contract, and in accordance with Reference 1 & 2.
- D. **Welding inspection personnel** must be independent of production (i.e., they shall not have direct responsibility for performance or supervision of the work they are assigned to inspect/examine) and shall be certified or approved by LANL WPA or his designee.
- E. **Welding inspection personnel** must perform inspections using procedures approved by LANL WPA; approved LANL procedures are posted on the Volume 6 website.
- F. **Welding inspection personnel** must document inspections performed. See GWS 1-02 (*Paras. 5.6 and 5.8*) and Attachment 3, *Weld Inspection Record*.
- G. **Personnel performing welding** at LANL shall be qualified and certified in accordance with GWS 1-05, *Welder Performance Qualification and Certification* unless excluded or exempt in accordance with GWS 1-01 *Introduction & Scope* Para. 5.2 & or 5.3.

NOTE: This procedure is not applicable to welders conducting in-process inspection or visual examination of their own work.

- H. *The LANL IBC Program (ref. 4) uses this qualification procedure/process to maintain LANL Building Official-approved welding inspection agencies and inspection personnel.*

5.0 PROCEDURE

5.1 Vision Requirements

- A. Inspection personnel shall undergo an annual vision examination by LANL Occupational Medicine. Results of this examination shall be recorded on Attachment 1, or an equivalent form, for all vision examinations.
- B. Vision examinations shall assure natural or corrected near distance visual acuity such that the individual can read J1 & J2 letters on a standard Jaeger chart, or equivalent, in at least one eye. The ability to perceive an Ortho-Rater minimum of 8 or equivalent shall be considered an acceptable Jaeger equivalent.
- C. Natural or corrected far distance visual acuity shall be verified at 20/30 or better in at least one eye using the Snellen scale or equivalent.
- D. A color test shall be administered upon initial certification to confirm that each individual can recognize four basic colors (red, yellow, blue and green). The color test need not be repeated unless there is reason to believe the individual has experienced a change in color vision.

- E. Individuals not passing the near or far distance vision test requirements shall obtain the necessary correction prior to certification. Personnel who fail to identify the minimum number of color plates shall be required to demonstrate the capability of distinguishing and differentiating contrast between colors. This may be accomplished by practical demonstration (e.g., yarn test). The WPA responsible shall review such tests for impact during certification.
- F. *Guidance: Elimination of the need for corrective lenses due to surgery (e.g., laser vision correction) should be noted on the annual re-certification.*

5.2 Qualification and Certification

- A. Personnel who perform welding inspections for acceptance shall:
1. be certified or approved by LANL WPA or their designee and
 2. hold a current AWS-CWI, AWS-SCWI, or AWS-CAWI under the direct supervision of an AWS-CWI, an ASNT-SNT-TC-1A Level II or Level III in visual method, or:
- B. Alternately, they may apply for a LANL WPA-approved equivalent certification and be considered qualified provided they meet the following:
- A high school diploma or equivalent and a minimum of five (5) years experience in design, fabrication, welding, installation, and inspection of related industrial or nuclear construction; or
 - A related technical school diploma and a minimum of two (2) years experience in design, fabrication, welding, installation, or inspection of related industrial or nuclear construction, or
 - Demonstrate to WPA a working knowledge of the welding discipline through a combination of interviews, ability demonstrations, and/or written or verbally administered examinations.
- C. When engineering specifications and fabrication/construction codes do not mandate formal certification for visual welding inspectors, the qualification requirements of paragraph 5.2.B may be applied to individual welders or craft/technician supervision.
- D. Attachment 2, *Inspector Certification* or equivalent shall be completed for individuals meeting the criteria for certification.
- E. LANL WPA shall maintain a file of qualification records for LANL welding inspectors. The certification files may be stored in the form of an electronic database.

Access internal listing via Ch. 13 webpage [here](#).

5.3 Owners Inspector

When applicable Codes or Standards specify that work be inspected by an owners representative:

Guidance Note: Several codes and standards require two levels of inspection, one by the contractor/fabricator and the other by an owner's inspector.

See GWS 1-02 Para. 5.8 Owner Inspector requirements and GWS 1-02 Attachment 4 for a list of codes and standards that require two levels of inspection.

- A. Owner Inspector personnel shall be qualified & approved by Construction Management Construction Inspection group (CM-CE).
- B. Inspections shall be performed and documented as required by CM-CE.
- C. At LANL’s discretion, LANL inspectors may serve as both the manufacturer/fabricator examiner and owners inspector. *Guidance Note: Some Codes (example AWS D1.1) require that if this is exercised it must be invoked by contract with the manufacture/fabricator.*

6.0 ATTACHMENTS

Attachment 1: Visual Acuity Record

Attachment 2: Inspector Certification