

ADMINISTRATIVE PROCEDURE

FACILITIES WELDING AND BRAZING

APPLICATION

To ensure appropriate controls are identified and maintained to guarantee that welder qualification, welding, and welding inspection activities meet applicable codes and standards. In addition, to ensure that appropriate documentation is generated and maintained in order to demonstrate that these codes and standards have been met.

This Procedure Applies to Facilities Plant Operations, Small Projects, and Capital Projects, for all persons performing welding on LBNL property.

WORK CONTROL PROCESSES

The Facilities Division controls work through Small Projects, Capital Projects, and Plant Operations.

Plant Operations utilizes the Computerized Maintenance Management System (CMMS) Maximo to process and control issuing of work orders for work requests large and small. The work orders can be issued by the Work Request Center or the Supervisor. The work order is processed within the craft shop by the supervisor and/or the lead. A Task Hazard Analysis (THA) or personal protective equipment (PPE) pre-start checklist form is completed prior to executing the work. This is to plan and provide identification of areas that require controls in place, both routine and special. In accordance with Integrated Safety Management (ISM) procedure, the welding activities provided by Plant Operations are non-certified welding and brazing. The welding activities provided by Small Projects' Scheduled Work Center are non-certified welding/brazing and certified orbital welding.

Small Projects and Capital Projects utilize Project Management, Licensed Engineers, and Certified Inspectors (subcontract) to control work processes for welding activities, as defined by the Facilities Department Project and Design Manual. This manual requires all Facilities construction contracts to include building plans, drawings, and specifications. The subcontract welders are required to follow the LBNL Facilities Master Specifications for Structural Steel, Section M05120 Aluminum, Section M05130, and Plumbing Piping, Section M15410. The specifications detail welding parameters, joint configuration, type of weld, and filler materials. They include engineering specifications, approvals, certifications, and inspection/testing according to the appropriate governing codes.

SPECIAL INSTRUCTIONS

Facilities Division management determines the type of welding and the need for subcontract welders. Certified welding shall be performed by certified welders. The certified welding is for structural, and/or for plumbing/piping pressure boundaries on construction projects. The documents established for welding activities are contracts through Small Projects and Capital Projects with subcontractors and work orders in Plant Operations.

The LBNL Facilities Plant Operations, Small Projects, and Capital Projects do not perform or subcontract welding and brazing on Safety Class (SC), Safety Significant (SS), or Vital Safety Systems (VSS), Structures, Systems and Components (SSC), as identified by current Quality Assurance Programs (ref. 10 CFR 830 Subpart A and DOE Orders 414.1B, Quality Assurance).

It is vital to evaluate the work space for hazards; to identify required work conditions and equipment; to verify that required training has been completed; and to define the personnel, scope, and schedule of work to be performed.

Facilities staff follows the permitting requirements for digging activities, hot work, and confined spaces. In the event that the work performed requires certified welding, the LBNL Facilities Master Specifications for Structural Steel Section 05120, Aluminum Section M05130, and Plumbing Piping Section 05140 will apply.

REQUIREMENTS

All LBNL Facilities construction contracts may include building plans, drawings, and specifications as applicable to the contracted work. The subcontract welders are required to follow the LBNL Facilities Master Specifications for Structural Steel Section M05120, Aluminum Section M05130, and Plumbing Piping Section M15410 as attached to the contract documents. The specifications detail welding parameters, joint configuration, type of weld, and filler materials. They include engineering specifications, approvals, certifications, and inspection/testing requirements according to the appropriate governing codes.

QUALITY ASSURANCE

- 10 CFR 830 Subpart A, *Quality Assurance Requirements*
- DOE Orders 414.1B, *Quality Assurance*
- Facilities, *Quality Assurance*

INSPECTION

The LBNL Facilities Master Specifications for Structural Steel Section 01520, Aluminum Section M05130, and Plumbing Piping Section 15410 require inspection and testing according to the appropriate governing codes: American Institute of Steel Construction, American Welding Society, California Building Code, Federal Emergency Management Agency 353, American Society for Testing and Materials, American Society for Mechanical Engineers, and the National Fire Protection Association.

In accordance with the job specifications, contract construction jobs require subcontractors to submit welding procedure specifications and welder certifications prior to performing work. These specifications are reviewed by LBNL for conformance with the project specifications. As work is performed, an LBNL-contracted certified welding inspector performs daily weld inspections. Inspectors also check welder certifications at the job site.

LBNL's EH&S Division conducts hazard evaluations of jobs that involve welding, brazing, and cutting performed by subcontractors and Facilities Division staff, to determine appropriate engineering and administrative controls, Personal Protective Equipment (PPE), and permits. For construction projects, project specific specifications are developed for welding activities and are incorporated into the contract documents as applicable. The documentation that the inspections generate is reviewed by the Engineer of record and retained in the project files. Facilities Division welding activities are evaluated on a case-by-case basis. Welding tasks are classified and addressed by similar exposure groups (SEGs).

CERTIFICATION

All subcontract welders are required to have current certification in accordance with the latest applicable AWS standards. This requirement follows the LBNL Facilities Master Specifications for Structural Steel Section 05120, Aluminum Section M05130, and Plumbing Piping Section 15410. As required by the subcontracted work, each welder must provide evidence of current certification to appropriate Facilities Division management prior to arriving on site. For instances in which a subcontractor sends welders not pre-approved by Facilities Division management, subcontract welders must provide proper certifications upon arrival.

QUALIFICATIONS

All LBNL Facilities Plant Operations employees who are approved by management to perform non-certified and/or certified welding are qualified welders upon hire, based on prior verification of welding experience and training, or by certificate documentation. No formal training program is provided for performing welding. A formalized documentation (PQR – Procedure Qualification Record, WPS – Welding Procedure Specification, WQR – Welder Qualification Record) of welder qualification is used to validate welder competence per the welding requirement.

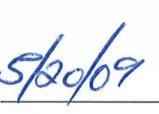
In the rare instance that emergency plumbing repairs are required, the 2001 California Plumbing Code (based on the 2000 Uniform Plumbing Code) addresses welding certification(s), repairs and alterations: "In existing buildings or premises in which plumbing installations are to be altered, repaired, or renovated, deviations from the provisions of this Code are permitted, provided such deviations are found to be necessary and are first approved by the Administrative Authority" (Facilities Director or designee).

REFERENCES

- PUB-3000, Chapter 12, *Fire Prevention and Protection*;
- EHS0535, *Hot Work Permits*;
- 29 CFR 1910.252, *Welding, Cutting, and Brazing*;
- 8 California Code of Regulations (CCR) Article 90, *Electrical Welding, Cutting, and Heating*;
- DOE Order 420.1, *Facility Safety*;
- DOE Order 440.1, *Worker Protection Management for DOE Federal and Contractor Employees*;
- NFPA Standard 51B, *Fire Prevention in Use of Cutting and Welding Processes*;
- American National Standards Institute (ANSI) Standards Z49.1, *Safety in Welding, Cutting, and Allied Processes*;
- Implementation Guide to DOE Orders 420.1 and 440.1, *Fire Safety Program*;
- Energy Facility Contractors Group Contactor Alert on Potential Welding Program Issues;
- American Society of Mechanical Engineers (ASME);
- American Welding Society (AWS);
- American Institute for Steel Construction (AISC);
- American Petroleum Institute (API);
- American Water Works Association (AWWA);
- LBNL Master Specifications for Structural Steel Section M05120;
- LBNL Master Specifications for Plumbing Piping Section M15410;
- California Plumbing Code.

RESPONSIBILITIES AND CONTROLS

Provide signature lines as follows:

REV NO.	SME/Title	REV/Title	APPROVED/Title	DATE	EFFECTIVE DATE
6	 Frederick T. Angliss Facilities Chief Civil Structural Engineer	 William Mattson 5/18/09 Facilities Scheduled Work Center Mechanical Services Supervisor	 Dennis Nielsen Facilities Small Projects Department Head	 5/20/09	MAY 20 2009
	 Michael C. Dong Facilities Operations Utility Manager				