

# Best Practice # 191

Dated 6\_16\_16

**Best Practice Title:** On-Site Review and Assessment of Subcontractor Welding Programs, Facilities and Operations

**Facility:** Multiple

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**Brief Description of Best Practice:** This Best Practice is related to Best Practice #162, *Improving the Quality of Subcontractor Welding*; these two practices are complimentary and should be used in conjunction with each other.

Provided herein are specific guidance and actions that can / should be taken for on-site review and assessment of Subcontractor (or Vendor) welding programs, facilities, and operations. These activities are to be performed by welding engineers and welding specialists (WE/S); those with specific experience and knowledge related to the welding services and / or the welded fabrications being procured. Assessment results shall be reviewed and coordinated (by the WE/S) with Procurement personnel to ensure the successful evaluation of the potential Subcontractor.

## **Recommended Practice:**

- 1) Prior to on-site assessment, the WE/S shall review details associated with the Subcontractor scope of work, to include:
  - a) Description of welding services, fabrications, equipment, etc.
  - b) Governing welding codes and standards
  - c) Design welding requirements and criteria
  - d) Unique procurement expectations / requirements, e.g., regulatory criteria, cost, schedule, etc.
  - e) Prior performance or history with the Subcontractor
- 2) Documentation to be generated as a result of the assessment:
  - a) Document results of the assessment on Attachment 1, *Subcontractor Welding Program Review and Assessment Checklist*
    - The goal is to document sufficient information to provide recommendation, and technical basis, regarding suitability of the Subcontractor and its welding program for the specified procurement

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- 3) On-Site Reviewer conduct and behavior:
  - a) The WE/S shall maintain a professional approach to the review and assessment activities including all communications with Subcontractor management, staff and welding personnel
  - b) The WE/S shall not direct Subcontractor employees / personnel work – issues or concerns shall be taken up with Subcontractor management
- 4) Subcontractor Personnel and Organization:
  - a) At the start of the on-site assessment, an Entrance Meeting shall be held with key Subcontractor personnel. The following, at a minimum, should be part of the meeting agenda:
    - Introductions
    - Purpose and scope of the assessment
    - Safety while in the Subcontractor’s facility
    - Subcontractor organization including personnel roles and responsibilities
    - Record names of key Subcontractor personnel, roles and responsibilities and other notable information on the Attachment 1 form
- 5) Points of assessment:
  - a) Subcontractor procedures shall be reviewed either prior to or at the start of the assessment. Procedures or documents may include but are not limited to the following:
    - Welding Manual
    - Welding Procedure specifications
    - Procedure Qualification records
    - Welder / Welding Operator Performance Qualification records
    - Filler Material Control procedures
    - Inspection and NDE procedures
    - Quality records related to welding (travelers)
    - Other standards and practices related to welding fabrication as required
  - b) General information on the capabilities and capacities of the shop should be assessed. This may include, but not limited to the following:
    - Square footage of shop and related facilities
    - Number of welders and fitters

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- Welding equipment
  - Welding machines
  - Welding processes / types
  - Crane capacities and numbers
  - Positioner capacities
  - Cutting tables
  - Other notable equipment
- c) Specific review of skills and capabilities to successfully perform the work should be conducted. This can be accomplished by review of workmanship such as:
- Witness of actual welding performed on a saddle-on tee joint, miter joint, circumferential butt joint, etc.
  - Evaluation of purge and purging techniques when required for materials such as stainless steels and nickel alloys – pre-weld, during welding, and post welding
  - Evaluation of techniques / methods used to minimize distortion – jigs, fixtures, welding / heating techniques, etc.

## 6) Reporting:

- a) At conclusion of the assessment, discuss any significant findings (positive and negative) with the Subcontractor at the Exit Meeting
- b) Prepare a report that summarizes findings and provides information on the items outlined above. The report should be completed as soon as practicable upon conclusion of the assessment.
- c) The report should include a recommendation / assessment as to whether or not the Subcontractor will be able to successfully complete the welding activities in accordance with specified requirements and criteria. The report should be submitted to and reviewed with appropriate Procurement personnel for final evaluation.

**Why the Best Practice is used:** Issues with Subcontractor supplied welded fabrications have been experienced throughout the DOE Complex and are not uncommon within industry, especially where the overall level of welding expertise (procedures, practices and/or qualifications) may be lacking. Performing due diligence through proper vetting of Subcontractor welding capability (welding program), prior to start of work, can significantly improve the quality and acceptability of the procured, welded fabrications. It is essential that WE/S personnel be involved in the upfront, on-site review and assessment of Subcontractor welding programs, facilities, and operations.

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**What are the benefits of the Best Practice:** The benefits of performing the activities defined herein can lead to:

- Improved Subcontractor safety performance,
- Increased technical accuracy,
- Improved quality and scope control,
- Elimination or reduction of weld rework,
- Intended quality delivered the first time,
- Cost and schedule compliance, and
- A positive public image and performance reputation relative to overall quality.

**What problems/issues were associated with the Best Practice:** Procurement of welded fabrications that fail to meet quality requirements for use at DOE Sites and Facilities can often be attributed to poor or inadequate Subcontractor welding programs and operations. Unacceptable weld quality usually requires rework, which leads to additional cost, lost schedule and added exposure to safety risk. Engaging WE/S resources in upfront review and assessment of Subcontractor Welding Programs will increase the odds of successful procurement and lead to the benefits noted above.

**How the success of the Best Practice was measured:** The following does not rely on study data to quantify the relationship between Subcontractor weld quality and welding program status; but rather, on significant anecdotal evidence that such a correlation exists. Welding Engineers and Specialists are routinely invited to help solve Subcontractor welding problems. The vast majority of issues arise from Subcontractors that either do not have a “welding program”, or if they do, it is inadequate. Subcontractors with good programs and personnel generally produce acceptable welded fabrications – good weld quality.

**Description of process experience using the Best Practice:** This best practice is based on feedback and lessons learned from members of the DOE EFCOG Welding Subgroup. Subgroup members include Site Welding Program managers, Welding Engineers and Specialists; the recommendations provided herein represent their collective experience with Subcontractor welding activities throughout the DOE Complex.

Proper review and assessment (vetting) of potential Subcontractor welding programs, by appropriate WE/S personnel, is critical to the successful procurement of welded fabrications for DOE Complex use.

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## Attachment: Subcontractor Welding Program Review and Assessment Checklist

Scope of Services:	_____	Review Team:	_____
Procurement Title:	_____		_____
Procurement Location:	_____		_____
Governing Code(s):	_____		_____
Design Requirements:	_____	Review Location:	_____
	_____		_____

Project Principals:		Discipline Principals:	
<u>Name</u>	<u>Function</u>	<u>Name</u>	<u>Function</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Entrance Mtg Date:	_____	Exit Mtg Date:	_____
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Entrance Meeting Attendees:		Exit Meeting Attendees:	
<u>Name</u>	<u>Function</u>	<u>Name</u>	<u>Function</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Interview List			
<u>Name</u>	<u>Function</u>	<u>Name</u>	<u>Function</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**Review Summary / Additional Comments**

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