Approved additions and revisions to guide material under §§192.273, 192.281, 192.283 and GMA-G-192-1. Ready for 2nd LB.

PRIMARY: 192.281, 192.287
PURPOSE: 1) Review GM 192.281 section 3.2 (g) to address NTSB report for Gas explosion and subsequent fire, New York City, New York concludes that plastic pipe fusion needs cleaned. This would be in accordance to ASTM F2620-12 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
2) Review 192.287 to incorporate GM recommendations for inspecting heat fusion of plastic pipe joints.
ORIGIN/RATIONALE: 2016 – March 15 Damage Prevention/Emergency Response Task Group minutes
NTSB recommendation from PAR 15-01 report for Gas explosion and subsequent fire, New York City, NY.
RESPONSIBLE GROUP: Plastics Task Group

Letter Ballot Note: Changes from LB1-2018 are shown in yellow highlight.

Section 192.273

1 JOINT CAPABILITY
2 JOINT CLASSIFICATION
3 WRITTEN PROCEDURES FOR JOINING
4 BOLTING
5 THREADED JOINTS
6 MECHANICAL JOINTS IN METALLIC PIPELINES
7 INSPECTION OF JOINTS

Each step in the joining process must be followed to make acceptable joints (§192.273(b)). The joint must be visually inspected during and after the assembly or joining process per §§192.273(c) and 192.285(b) to ensure that the requirements are met. The inspector must be qualified in accordance with §192.287. Photos, examples, or diagrams for visual reference of the types of joints (pipe-to-pipe and pipe-to-fitting) should be available to the person inspecting the joint. In accordance with §192.273(c), each joint must be inspected to ensure that the requirements to make gas-tight joints are met. Consider providing visual references such as photos, examples, or diagrams of the joint types (pipe-to-pipe and pipe-to-fitting) to the person inspecting the joint. If the joint does not appear similar to the acceptable visual references, it should be removed.

Section 192.281

1 INTRODUCTION (Plastic-to-plastic and plastic-to-metal)
2 GENERAL (Plastic-to-plastic)
3 FIELD JOINING (Plastic-to-plastic and plastic-to-metal)
3.1 Solvent cement for repairing PVC piping only. (Plastic-to-plastic)
3.2 Heat fusion for PA-to-PA and PE-to-PE only by externally applied heat. (Plastic-to-plastic)

(g) Other recommendations for making heat-fusion joints may be found in ASTM F2620, “Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings,” ASTM D2657.

3.3 Heat fusion by electrofusion. (Plastic-to-plastic)
(a) Sections 192.273 and 192.283 require that procedures for making joints other than by welding be written and qualified. Each electrofusion equipment manufacturer is a source of appropriate procedures for their respective system. The operator should check state requirements on the use of electrofusion. Generally each procedure should contain some or all of the following elements:
1. Couplings.
(i) The pipe should be cut at a square angle.
(ii) The pipe should be marked with the proper stab depth for the fitting.
(iii) The mating surfaces should be clean, dry, and free of material that might be detrimental to the joint.
(iv) Surface oxidation should be removed from the area of the pipe to be fused, up to the stab-depth marks, using the tool specified in the qualified procedure.
(v) One end of the pipe should be secured in an appropriate clamping device, the fitting slid onto pipe, the second piece of pipe placed into clamp, and the fitting slid to final position onto each pipe so it is properly aligned. Insertion up to the stab-depth marks should be ensured.
(vi) The control box should be tested for proper function.
(vii) The fitting should be connected to the fusion control box and the cycle activated. The fitting should be left in the clamp until cooling has been completed.
(viii) The joint should be inspected in accordance with §192.273.

(2) Sidewall fittings.
(i) Determine the pipe area where the fitting is to be fused.
(ii) The mating surfaces should be clean, dry, and free of material that might be detrimental to the joint.
(iii) All surface oxidation should be removed from the pipe in the area to be fused using the tool specified in the qualified procedure.
(iv) The fitting should be positioned and clamped in the cleaned area.
(v) The fitting should be connected to the fusion control box and the cycle activated. The fitting should be left in the clamp until cooling has been completed.
(vi) The joint should be inspected in accordance with §192.273.

(b) ASTM F1055 (see §192.7) and ASTM F1290, ...

3.4 Adhesive for thermosetting pipe only. (Plastic-to-plastic)
3.5 Mechanical joints for all plastic piping. (Plastic-to-plastic and plastic-to-metal)

Section 192.283

1 WRITTEN PROCEDURES
2 PROCEDURE QUALIFICATION (Plastic-to-plastic and plastic-to-metal)

2.1 Procedure and qualification for joints and permanent repairs. (Plastic-to-plastic and plastic-to-metal)

(a) Solvent cement, heat fusion, and adhesive. (Plastic-to-plastic)

(1) Procedure. A separate procedure should be established for each plastic compound type and for each method of joining. The procedure specification should include at least the following.

(i) Plastic compound or compounds type (e.g., PE, PVC, PA).
(ii) Joint design.
(iii) Size and thickness range.
(iv) Method of joining.
(v) Pipe and fitting preparation (e.g., scraping, peeling, facing, abrading).
(vi) Cleaning requirements.
(vii) Curing or set-up time.
(viii) Temperature limits.
(ix) Temperature of the heating tool.
(x) Proper end finishing.
(xi) Cooling time.
(xii) Tools and equipment.
(xiii) Joining or repair technique. See 3 of the guide material under §192.281.

(2) Qualification. …

(b) Mechanical. (Plastic-to-plastic and plastic-to-metal)
2.2 Test requirements. (Plastic-to-plastic and plastic-to-metal)

3 UNLIKE PE COMPONENT QUALIFICATION

Guide Material Appendix G-192-1

Make the following revisions to Section 1.11 PLASTIC RELATED:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
<th>Section</th>
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</thead>
<tbody>
<tr>
<td>ASTM D2657</td>
<td>Heat Fusion Joining of Polyolefin Pipe and Fittings</td>
<td>§192.281</td>
</tr>
<tr>
<td>ASTM F2620</td>
<td>Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings</td>
<td>§192.281</td>
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