Task 38.1—Perform Visual Inspection of Pipe and Pipe Components Prior to Installation

1.0 Task Description

This task involves the visual inspection of pipe and components at the site of, and just prior to installation on, the pipeline system. The task does not include an assessment of damage and any determination of the measures that should be taken to mitigate the damage found during an inspection.

This task begins with visually inspecting pipe and components. This task ends with communicating the results.

2.0 Knowledge Component

The purpose of the inspection is to ensure that the pipe and components are not visibly damaged in a manner that could impair their strength or reduce their serviceability and to ensure that the pipe and components are rated for intended service.

An individual performing this task must have knowledge of the following.

— Coating defects that can be visually identified such as cuts, scratches, or other defects characterized by a visually determined loss of coating (holiday).

— Each length of pipe with a nominal outside diameter of 4¼ in. (114.3 mm) or more must be marked on the pipe or pipe coating with the specification to which it was made, the specified minimum yield strength or grade, and the pipe size. The marking must be applied in a manner that does not damage the pipe or pipe coating and must remain visible until the pipe is installed.

— Each valve must be marked on the body or the nameplate with at least the following:

  — manufacturer's name or trademark;

  — class designation or the maximum working pressure to which the valve may be subjected;

  — body material designation (the end connection material, if more than one type is used);

  — nominal valve size;

  — monogram license.

— Butt-welding type fittings must meet the marking and end preparation required by the operator’s specification.

Terms applicable to this task are as follows.

buckled or wrinkled bends
Bends must have a smooth contour. Buckles and wrinkles are physical defects that are characterized by bulging or warping of the pipe.

component
Any part of a pipeline that may be subjected to pump pressure, including but not limited to, pipe, valves, elbows, tees, flanges, and closures.

corrosion
Surface rust or pitting are examples of conditions that may be identified during a visual inspection.
crack
A surface flaw or defect characterized by a break without complete separation.

dent
A depression in the surface that has been created by external forces on the pipe or component with no visual evidence of metal loss.

gouge
A surface flaw characterized by the removal of steel from the pipe or component.

maximum operating pressure (MOP)

MOP
The maximum pressure at which a pipeline or segment of a pipeline or a component may be normally operated. Inspection shall include assurance that the pipe and/or component is compatible with MOP for the system in which it is to be installed.

mechanical defects
Buckles, dents, cracks, gouges, out-of-round pipe, or other defects that might reduce the strength of the pipe or pipe component. A crack is a surface flaw or defect characterized by break without complete separation. A gouge is a surface flaw characterized by the removal of steel from the pipe or component.

AOCs associated with the performance of this task include the following.

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3.0 Skill Component
To demonstrate proficiency of this task, an individual must perform the following steps.

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<th>Step</th>
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| 1    | Visually inspect pipe and components for:  
— corrosion;  
— defects such as cracks, grooves, gouges, dents, or out-of-round pipe;  
— coating damage;  
— bends inspect for buckles and/or wrinkles in bends. | This inspection occurs at the installation location just prior to installation.  
NOTE  This inspection does not include an assessment of damage and a determination of the measures necessary to mitigate the damage. |
| 2    | Ensure component is rated for intended service. | Inspector must know the design MOP for the system and ensure through visual verification of the markings on the pipe and components that the pipe or component is compatible.  
Confirm that the markings on the pipe and components are compatible with the MOP for the system. |
| 3    | Communicate the inspection results. | A satisfactory outcome of the inspection must be achieved. If not, the condition must be noted and resolved. |
1.0 Task Description

This task involves visually inspecting welds to ensure that they are in accordance with the latest DOT-approved edition of API 1104 and the applicable qualified welding procedure, and identifying any defects that may affect the integrity of a pipeline tie-in or component replacement.

This task begins with identifying any conditions that do not meet the qualified welding procedure or the latest DOT-approved edition of API 1104. This task ends with communicating the results.

This task does not include but may lead to the performance of other covered tasks such as:

— Perform NDT—Liquid Penetrant Testing (reference Task 38.5)
— Perform NDT—Magnetic Particle Testing (reference Task 38.6);
— Perform NDT—Radiographic Testing (reference Task 38.4)
— Perform NDT—Ultrasonic Testing (reference Task 38.7)

2.0 Knowledge Component

The purpose of the inspection is to ensure that the welds were produced with the correct welding procedure and to identify any defects that may affect the integrity of a pipeline tie-in or component replacement.

An individual performing this task must have knowledge of the following.

— This inspection of welds and identification of conditions as defined by the latest DOT edition of API 1104 and the operator’s applicable written welding procedure are limited to conditions that can be identified visually and include the following terms.

Terms applicable to this task are as follows.

arc burns
Occur on the internal or external surface of the pipe as a result of inadvertent arc strikes or improper grounding. They generally appear as a pit or cavity visible to the eye or as a dense area on the radiograph. The cavity may be surrounded by a hard heat-affected zone that may be of lower toughness than the base material or the weld deposit.

crack
A surface flaw or defect characterized by a break without complete separation.

external undercut (EU)
EU
A groove melted into the parent material adjacent to the toe or root of the weld and left unfilled by weld metal.

individual or scattered porosity
Gas trapped by solidifying weld metal before the gas has a chance to rise to the surface of the molten puddle and escape. Porosity is generally spherical but may be elongated or irregular in shape, such as piping (wormhole) porosity. When the size of the radiographic indication produced by a pore is measured, the maximum dimension of the indication shall apply to the criteria given in API 1104.
slag inclusions
A nonmetallic solid entrapped in the weld metal or between the weld metal and the parent material. Elongated slag inclusions (ESIs)—e.g. continuous or broken slag lines or wagon tracks—are usually found at the fusion zone. Isolated slag inclusions (ISIs) are irregularly shaped and may be located anywhere in the weld. For evaluation purposes, when the size of a radiographic indication of slag is measured, the indication’s maximum dimension shall be considered its length.

weld (cap) height
The distance the completed weld extends beyond the height of the parent material. The weld dimensions, including the weld height, are determined by the written welding procedure.

Qualified Welding Procedure
The Qualified Welding Procedure is a tested and proven detailed method by which sound welds with suitable mechanical properties can be produced. The procedure shall be written, and records shall include the results of qualifying tests. An individual performing this task must be knowledgeable of the operator’s applicable written welding procedure.

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### 3.0 Skill Component

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| 1    | Identify any conditions that do not meet the qualified welding procedure or the latest DOT-approved edition of API 1104. Conditions may include the following:  
  — arc burn,  
  — cracks,  
  — external undercut (EU),  
  — pinhole/porosity,  
  — slag,  
  — weld (cap) height—inaadequate or excessive. |  
  — Arc burns and cracks are not acceptable and must be repaired.  
  — The depth of EU adjacent to the final bead on the outside of the pipe shall not be more than $\frac{1}{32}$ in. or 12.5% of the pipe wall thickness (whichever is smaller). There shall not be more than 2 in. of EU in any continuous 12 in. length of weld.  
  — Surface pinholes are an indication of porosity.  
  — Slag and weld splatter can mask surface imperfections.  
  — Acceptable weld dimensions, including the minimum and maximum weld height, are determined by the applicable qualified welding procedure. |
| 2    | Communicate the inspection results. | A satisfactory outcome must be achieved. If a satisfactory outcome is not achieved, make appropriate notifications per the operator’s procedures; the condition must be noted and resolved. |
Task 38.4—Perform NDT—Radiographic Testing

1.0 Task Description

This task involves verifying that welds meet the specifications of the latest DOT-approved edition of API 1104 utilizing radiography and identifying any indications and imperfections that may affect the integrity of a pipeline tie-in, component installation/replacement, or pipeline repair.

This task begins with evaluating welds utilizing radiography to ensure they meet the requirements of the latest DOT-approved edition of API 1104. This task ends with communicating the results.

This task does not include but may lead to the performance of other covered tasks such as:

— Perform Visual Inspection of Welds (reference Task 38.3).

2.0 Knowledge Component

An individual performing this task must have knowledge of the following.

— The inspection of welds and identification of conditions as defined by the latest DOT edition of API 1104 and the operator’s applicable written welding procedure are limited to conditions that can be identified visually and include the following terms.

— An individual performing this task must provide documentation of certification through ASNT Recommended Practice No. SNT-TC-1A, ACCP certification for radiography, or any other recognized national certification program that shall be acceptable to the operator for the test method used.

AOCs associated with the performance of this task include the following.

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3.0 Skill Component

The certificate demonstrates task performance proficiency. No other steps are required for OQ qualification.

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<tbody>
<tr>
<td>1</td>
<td>Evaluate completed welds utilizing radiography to ensure they meet the requirements of the latest DOT-approved edition of API 1104.</td>
<td>Certification required to Level II or III in accordance with the recommendations of ASNT Recommended Practice No. SNT-TC-1A, ACCP for radiography, or any other recognized national certification program that shall be acceptable to the operator for the test method used.</td>
</tr>
<tr>
<td>2</td>
<td>Communicate the inspection results.</td>
<td>A satisfactory outcome must be achieved. If a satisfactory outcome is not achieved, make appropriate notifications per the operator’s procedures.</td>
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1.0 Task Description

This task involves verifying that welds meet the specifications of the latest DOT-approved edition of API 1104 utilizing liquid penetrant testing and identifying indications and imperfections that may affect the integrity of a pipeline tie-in, component installation/replacement, or pipeline repair.

This task begins with evaluating welds utilizing liquid penetrant testing to ensure they meet the requirements of the latest DOT-approved edition of API 1104. This task ends with communicating the results.

This task does not include but may lead to the performance of other covered tasks such as:

— Perform Visual Inspection of Welds (reference Task 38.3).

2.0 Knowledge Component

An individual performing this task must have knowledge of the following.

— The inspection of welds and identification of conditions as defined by the latest DOT edition of API 1104 and the operator’s applicable written welding procedure are limited to conditions that can be identified visually and include the following terms.

— An individual performing this task must provide documentation of certification through ASNT Recommended Practice No. SNT-TC-1A, ACCP certification for liquid penetrant testing, or any other recognized national certification program that shall be acceptable to the operators for the test method used.

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<tbody>
<tr>
<td>1</td>
<td>Evaluate completed welds utilizing liquid penetrant testing to ensure they meet the standards of the latest DOT-approved edition of API 1104.</td>
<td>Certification required to Level II or III in accordance with the recommendations of ASNT Recommended Practice No. SNT-TC-1A, ACCP for liquid penetrant testing, or any other recognized national certification program that shall be acceptable to the operators for the test method used.</td>
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Task 38.6—Perform NDT—Magnetic Particle Testing

1.0 Task Description

This task involves verifying that welds meet the specifications of the latest DOT-approved edition of API 1104 utilizing magnetic particle testing and to identifying any indications or perfections that may affect the integrity of a pipeline tie-in, component installation/replacement, or pipeline repair.

This task begins with evaluating welds utilizing magnetic particle testing to ensure they meet the requirements of the latest DOT-approved edition of API 1104. This task ends with communicating the results.

This task does not include but may lead to the performance of other covered tasks such as:

— Perform Visual Inspection of Welds (reference Task 38.3).

2.0 Knowledge Component

An individual performing this task must have knowledge of the following.

— The inspection of welds and identification of conditions as defined by the latest DOT edition of API 1104 and the operator’s applicable written welding procedure are limited to conditions that can be identified visually and include the following terms.

— An individual performing this task must provide documentation of certification through ASNT Recommended Practice No. SNT-TC-1A, ACCP certification for magnetic particle testing, or any other recognized national certification program that shall be acceptable to the operator for the test method used.

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<td>1</td>
<td>Evaluate completed welds through magnetic particle testing to ensure they meet the requirements of the latest DOT-approved edition of API 1104.</td>
<td>Certification required to Level II or III in accordance with the recommendations of ASNT Recommended Practice No. SNT-TC-1A, ACCP for magnetic particle testing, or any other recognized national certification program that shall be acceptable to the operator for the test method used.</td>
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<td>Communicate the inspection results.</td>
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Task 38.7—Perform NDT—Ultrasonic Testing

1.0 Task Description

This task involves verifying that welds meet the specifications of the latest DOT-approved edition of API 1104 utilizing ultrasonic testing and identifying any indications and imperfections that may affect the integrity of a pipeline tie-in, component installation/replacement, or pipeline repair.

This task begins with evaluating welds utilizing ultrasonic testing to ensure they meet the requirements of the latest DOT-approved edition of API 1104. This task ends with communicating the results.

This task does not include but may lead to the performance of other covered tasks such as:

— Perform Visual Inspection of Welds (reference Task 38.3).

2.0 Knowledge Component

An individual performing this task must have knowledge of the following.

— The inspection of welds and identification of conditions as defined by the latest DOT edition of API 1104 and the operator’s applicable written welding procedure are limited to conditions that can be identified visually and include the following terms.

— An individual performing this task must provide documentation of certification through ASNT Recommended Practice No. SNT-TC-1A, ACCP certification for ultrasonic testing, or any other recognized national certification program that shall be acceptable to the operator for the test method used.

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<tbody>
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<td>1</td>
<td>Evaluate completed welds utilizing ultrasonic testing to ensure they meet the requirements of the latest DOT-approved edition of API 1104.</td>
<td>Certification required to Level II or III in accordance with the recommendations of ASNT Recommended Practice No. SNT-TC-1A, ACCP for ultrasonic testing, or any other recognized national certification program that shall be acceptable to the operator for the test method used.</td>
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<td>2</td>
<td>Communicate the inspection results.</td>
<td>A satisfactory outcome must be achieved. If a satisfactory outcome is not achieved, make appropriate notifications per the operator’s procedures.</td>
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