Task 27.1—Perform Routine Inspection of Breakout Tanks (API 653 Monthly or DOT Annual)

1.0 Task Description

This task involves performing routine tank inspections in accordance with the latest DOT-adopted edition of API 653. Individuals performing routine inspections do not need to be an authorized inspector as defined in API 653 or API 510.

This task begins with the visual inspection of the tank. The task ends when the documentation is complete.

The performance of this covered task may require the performance of other covered tasks such as:

— Perform API 653 Inspection of In-service Breakout Tanks (Reference Task 27.2).

— Perform API 510 Inspection of In-service Breakout Tanks (Reference Task 27.3).

2.0 Knowledge Component

The purpose of this task is to evaluate the condition of a breakout tank by visually determining the condition of the tank and its components.

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

— The three primary types of atmospheric steel aboveground breakout tanks.

1) External/Open Top Floating Roof Tanks—An open-topped cylindrical aboveground steel shell equipped with a roof that floats on the surface of the stored liquid. The roof rises and falls with the liquid level in the tank. There is a rim seal system between the tank shell and roof to reduce rim evaporation.

   The roof has support legs hanging down into the liquid. At low liquid levels, the roof eventually lands, and a vapor space forms between the liquid surface and the roof, similar to a fixed roof tank. The support legs are usually retractable to increase the working volume of the tank.

2) Fixed/Cone Roof Tank—A closed-top cylindrical aboveground steel shell with a cone roof supported principally either by rafters on girders and columns or by rafters on trusses with or without columns, a self-supporting cone roof that is supported only at its periphery, or a self-supporting dome roof formed to approximately a spherical surface that is supported only at its periphery.

3) Internal Floating Roof Tanks—These tanks are cone roof tanks with a floating roof inside that travels up and down along with the liquid level.

— The three primary types of secondary containment systems:

- Steel
- Concrete
- Earthen (e.g., soil, dirt, rocks)

Terms applicable to this task:

bottom projection plate (chime ring)
The outside edge of the tank bottom that extends past the weld of the tank shell.

reinforcing plate/pad/repad
Steel reinforcement plates installed around appurtenances to provide added strength to the structure.

roof

The top external surface of the tank.

secondary containment
An impoundment, such as a dike, that could contain spilled product on site. The impoundment may be constructed of concrete, earth, steel, or solid masonry and is designed to be liquid tight.

shell
The vertical, cylindrical walls of a tank.

shell appurtenances
Manways, reinforcement plates, nozzles, sampling ports, temperature probes, mixers, and auto-gauge systems.

tank foundation/ring wall
Provides support for the tank. The foundation/ring wall may be made from concrete, earth, or other supportive materials.

telltale/weep hole
A threaded penetration of the reinforcing plate that is used to determine if the shell has developed a leak in the area where the reinforcing plate covers the shell.

Abnormal operating conditions (AOC) associated with the performance of this task:

AOC Recognition	AOC Reaction
Unexpected release or discharge of product.	Notify the appropriate personnel to take actions as required.
Mechanical or corrosion damage is observed.	Make appropriate notifications according to Operator's procedures.
Secondary containment system damage	Make appropriate notifications according to Operator's procedures.

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Visually inspect for settlement around the perimeter of the tank and the condition of the foundation: - check that rainwater runoff from the shell drains away from tank, - inspect for broken concrete and cracks, - inspect for cavities under the foundation and vegetation against the bottom of the tank, - sheen on water or product on ground in containment area.	Visual inspection of the foundation is performed to identify conditions such as settlement or lack of support under the tank shell/floor. Surface water should be kept away from the tank to prevent corrosion or erosion of the foundation. If a sheen on water or product on ground is observed, make appropriate notifications according to Operator's procedures.

2	Visually inspect the following items for evidence of leaks, corrosion, pitting, and distortion, as applicable: - mixer seals, - flanges, - manways/nozzles, - bottom projection plate, - welds/rivets, - telltales/weep holes on reinforcing pads, - reinforcement plate/padding around appurtenances, - inspect for shell distortions—look for deflection or deformation of the shell, - insulation condition - tank grounding system components	Visual inspection of the shell is performed to identify coating condition, areas of pitting, or corrosion and distortions. Leaks indicate an integrity issue, and immediate response according to operator's policies is required. Response actions may include stopping operation and securing equipment, if safe to do so, immediately notifying the Operator, and executing applicable emergency procedures.
3	Visually inspect the secondary containment system for impoundment integrity.	The tank dike wall must be maintained so that the containment area capacity remains as designed. Dikes compromised by erosion, excavations, or excessive vegetation need to be addressed per Operator's procedures.
4	Visually inspect the tank roof for the following, if applicable: - coating condition, holes, pitting, and corrosion. - standing or pooling water or product. - floating roof out of level. - roof supports.	Large standing water areas on a floating roof indicate inadequate drainage design. Nonlevel roof indicates possible leaking pontoons. Floating roofs can sink and possibly impact the integrity of the tank floor if excessive weight from water/product on top of the roof is not removed. Significant sagging of a fixed roof deck indicates potential rafter failure.
5	Document the findings of the inspection.	Submit a completed inspection form according to Operator's procedures.

Task 32—Observe Excavation Activities

1.0 Task Description

This task is intended for the individual that is responsible for the observation of, and taking action to prevent, excavation activities from damaging buried pipeline facilities. This task does not apply to horizontal/directional drilling but does apply to all vertical drilling (e.g., soil sampling) when pipelines are known to be in the area of the excavation activity.

This task begins with verifying that the pipeline(s) has been properly located and marked. This task ends with the completion of the required documentation after all intended earth removal has been accomplished.

The performance of this covered task may require the performance of other covered tasks such as:

- Locate Line (Reference Task 14.1).
- Install, Inspect, and Maintain Temporary Marker (Reference Task 14.5).

2.0 Knowledge Component

This activity is performed to prevent damage to submerged or buried pipelines during excavation activities. An individual performing this task must have knowledge of:

- Operator Damage Prevention Program, including the requirement for compliance with the One-Call system and the required on-site temporary markings of facilities within the area of excavation.
- Allowable positioning of equipment, materials, or supplies at the excavation site as not to produce unacceptable stress loads on buried structures or excavations.
- Operator procedures, specifications, or methodology for excavation criteria or process, which may include but is not limited to:
  - tolerance zones,
  - hand excavations requirements,
  - pothole requirements for facility identification,
  - soft excavation requirements (e.g. vacuum or water jet excavation).
- Damage and injury prevention requirements for an unattended excavation site.
- Types of equipment or tools that are appropriate for the excavation, which can include:
  - heavy excavation equipment,
  - jackhammer,
  - vacuum excavator,
  - shovels and hand tools.

Terms applicable to this task:

excavation
Any operation using nonmechanical or mechanized equipment, demolition, or explosives in the movement of earth, rock, or other material below existing grade.

tolerance zone
The space in which a line or facility is located and in which hand digging or other noninvasive excavation methods may be necessary.

Abnormal operating conditions (AOC) associated with the performance of this task include:

AOC Recognition	AOC Reaction
Pipeline is hit during the excavation.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Unplanned or preexisting release of hazardous liquid or gas.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Discovery of damage to an underground pipeline facility, including but not limited to: - coating, - casing, - conduits, - any communication or protection device.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Discovery of an unexpected foreign structure in the area of excavation.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Insufficient support for the pipeline during excavation.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Verify that the pipeline has been located and marked.	Markings may be paint, flag, or other standard indicators of pipeline location.
2	Ensure that notification has been made to the control center or local operations at the beginning of work.	Operations personnel should closely monitor pipeline pressure and flow during excavation activities.
3	Identify an appropriate location for excavated material	The spoil should not be placed in a location that could affect the integrity of the pipeline. Provide adequate distance from the excavation to ensure the integrity of the excavation, prevent excessive stress on the pipeline, and prevent pipeline damage because of collapse.
4	Identify the hazards surrounding the excavation site.	Observes for irregularities. Ensures hazards are avoided and prevents damage to the line or any appurtenances. Hazards may be marked, unmarked, or underground.
5	Determine and communicate to excavator the required tolerance zone and any site-specific Operator requirements.	Adherence to tolerance zones reduces the probability that the pipeline will be hit. Site-specific Operator requirements may include, but are not limited to, the use of a flat bar, spotter, or equipment preparation.
6	Ensure that the tolerance zone is maintained during excavation. Require hand digging or other noninvasive excavation methods of the remaining soil within the tolerance zone.	Use of hand tools, vacuum excavation, or other noninvasive methods minimizes the probability of damage when excavating near the pipe.

7	Confirm that the pipe is supported as necessary during and after excavation.	Proper pipe support helps prevent pipe sag or other conditions that could affect the integrity of the pipe.
8	Notify control center or local operations at the completion of work.	Ensure the line is monitored during and after excavation activities.
9	Document the excavation per Operator procedures.	Documentation about the excavation may include, but is not limited to, the following: - date; - location (line segment, mile post, etc.); - name of excavator; - purpose of excavation; - scope of excavation (size, extent, etc.); - One-Call information, if required; - depth of cover.

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

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:

- Coating defects that can be visually identified such as cuts, scratches, or other defects characterized by a visually determined loss of coating (also known as a “holiday”).
- Each length of pipe with a nominal outside diameter of $4^1/_2$ 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:

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
The maximum pressure at which a pipeline or segment of a pipeline or a component may be normally operated.

Abnormal operating conditions (AOC) associated with the performance of this task include:

AOC Recognition	AOC Reaction
Mechanical, corrosion, or coating damage is present on component.	Make appropriate notifications according to Operator's procedures.

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Visually inspect pipe and components for: corrosion; - defects such as cracks, grooves, gouges, dents, or out-of-round pipe; - coating damage; - buckles 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.	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. Complete all required documentation and notifications according to Operator procedures.

Task 38.3—Perform Visual Inspection of Welds

1.0 Task Description

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

This task begins with identifying any conditions that do not meet the qualified welding procedure or the 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—Radiographic Testing (Reference Task 38.4).
- Perform NDT—Liquid Penetrant Testing (Reference Task 38.5).
- Perform NDT—Magnetic Particle Testing (Reference Task 38.6).
- 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 inspection of welds and identification of conditions as defined by the DOT-approved edition of API 1104 and the Operator's applicable written welding procedure(s) are limited to conditions that can be identified visually.

Terms applicable to this task:

arc burns
These 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. 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
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.

qualified welding procedure
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.

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.

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.

Abnormal operating conditions (AOC) associated with the performance of this task include:

AOC Recognition	AOC Reaction
Mechanical, corrosion, or coating damage is present on component.	Make appropriate notifications according to Operator's procedures.

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Identify any conditions that do not meet the qualified welding procedure or the DOT-approved edition of API 1104. Conditions may include the following: - arc burn, - cracks, - external undercut (EU), - pinhole/porosity, - slag, - weld (cap) height—inadequate or excessive.	Arc burns and cracks are not acceptable and must be repaired. 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.

Task 27.1—Perform Routine Inspection of Breakout Tanks (API 653 Monthly or DOT Annual)

1.0 Task Description

This task involves performing routine tank inspections in accordance with the latest DOT-adopted edition of API 653. Individuals performing routine inspections do not need to be an authorized inspector as defined in API 653 or API 510.

This task begins with the visual inspection of the tank. The task ends when the documentation is complete.

The performance of this covered task may require the performance of other covered tasks such as ~~the following.~~:

— Perform API 653 Inspection of In-service Breakout Tanks (~~reference~~ Reference Task 27.2).

— Perform API 510 Inspection of In-service Breakout Tanks (~~reference~~ Reference Task 27.3).

2.0 Knowledge Component

The purpose of this task is to evaluate the condition of a breakout tank by visually determining the condition of the tank and its components.

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

— The three primary types of atmospheric steel aboveground breakout tanks.

1) External/Open Top Floating Roof Tanks—An open-topped cylindrical aboveground steel shell equipped with a roof that floats on the surface of the stored liquid. The roof rises and falls with the liquid level in the tank. There is a rim seal system between the tank shell and roof to reduce rim evaporation.

   The roof has support legs hanging down into the liquid. At low liquid levels, the roof eventually lands, and a vapor space forms between the liquid surface and the roof, similar to a fixed roof tank. The support legs are usually retractable to increase the working volume of the tank.

2) Fixed/Cone Roof Tank—A closed-top cylindrical aboveground steel shell with a cone roof supported principally either by rafters on girders and columns or by rafters on trusses with or without columns, a self-supporting cone roof that is supported only at its periphery, or a self-supporting dome roof formed to approximately a spherical surface that is supported only at its periphery.

3) Internal Floating Roof Tanks—These tanks are cone roof tanks with a floating roof inside that travels up and down along with the liquid level.

— The three primary types of secondary containment systems:

- Steel
- Concrete
- Earthen (e.g., soil, dirt, rocks)

Terms applicable to this task ~~are as follows.~~:

bottom projection plate (chime ring)
The outside edge of the tank bottom that extends past the weld of the tank shell.

reinforcing plate/pad/repad
Steel reinforcement plates installed around appurtenances to provide added strength to the structure.

roof
The top external surface of the tank.

secondary containment
An impoundment, such as a dike, that could contain spilled product on site. The impoundment may be constructed of concrete, earth, steel, or solid masonry and is designed to be liquid tight.

shell
The vertical, cylindrical walls of a tank.

shell appurtenances
Manways, reinforcement plates, nozzles, sampling ports, temperature probes, mixers, and auto-gauge systems.

tank foundation/ring wall
Provides support for the tank. The foundation/ring wall may be made from concrete, earth, or other supportive materials.

telltale/weep hole
A threaded penetration of the reinforcing plate that is used to determine if the shell has developed a leak in the area where the reinforcing plate covers the shell.

Abnormal operating conditions (AOC) ~~AOCs~~ associated with the performance of this task ~~include the following.~~:

AOC Recognition	AOC Reaction
Unexpected release or discharge of product.	Notify the appropriate personnel to take actions as required.
Mechanical or corrosion damage is observed.	Make appropriate notifications according to Operator's procedures.
Secondary containment system damage	Make appropriate notifications according to Operator's procedures.
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3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps~~.~~:

Step	Action	Explanation
1	Visually inspect for settlement around the perimeter of the tank and the condition of the foundation: - check that rainwater runoff from the shell drains away from tank, - inspect for broken concrete and cracks, - inspect for cavities under the foundation and vegetation against the bottom of the tank, - sheen on water or product on ground in containment area.	Visual inspection of the foundation is performed to identify conditions such as settlement or lack of support under the tank shell/floor. Surface water should be kept away from the tank to prevent corrosion or erosion of the foundation. If a sheen on water or product on ground is observed, make appropriate notifications according to Operator's procedures.

2	Visually inspect the following items for evidence of leaks, corrosion, pitting, and distortion, as applicable: - mixer seals, - flanges, - manways/nozzles, - bottom projection plate, - welds/rivets, - telltales/weep holes on reinforcing pads, - reinforcement plate/padding around appurtenances, - inspect for shell distortions—look for deflection or deformation of the shell, - insulation condition - tank grounding system components -	Visual inspection of the shell is performed to identify coating condition, areas of pitting, or corrosion and distortions. Leaks indicate an integrity issue, and immediate response according to operator's policies is required. Response actions may include stopping operation and securing equipment, if safe to do so, immediately notifying the ~~operator~~Operator, and executing applicable emergency procedures.
3	Visually inspect the secondary containment system for impoundment integrity.	The tank dike wall must be maintained so that the containment area capacity remains as designed. Dikes compromised by erosion, excavations, or excessive vegetation need to be addressed per ~~operator's~~ Operator's procedures.
4	Visually inspect the tank roof for the following, if applicable: - coating condition, holes, pitting, and corrosion. - standing or pooling water or product. - floating roof out of level. - roof supports.	Large standing water areas on a floating roof indicate inadequate drainage design. Nonlevel roof indicates possible leaking pontoons. Floating roofs can sink and possibly impact the integrity of the tank floor if excessive weight from water/product on top of the roof is not removed. Significant sagging of a fixed roof deck indicates potential rafter failure.
5	Document the findings of the inspection.	Submit a completed inspection form according to ~~operator's~~ Operator's procedures.

Task 32—Observe Excavation Activities

1.0 Task Description

This task is intended for the individual that is responsible for the observation of, and taking action to prevent, excavation activities from damaging buried pipeline facilities. This task does not apply to horizontal/directional drilling but does apply to all vertical drilling (e.g., soil sampling) when pipelines are known to be in the area of the excavation activity.

This task begins with verifying that the pipeline(s) has been properly located and marked. This task and ends with the completion of the required documentation after all intended earth removal has been accomplished.

The performance of this covered task may require the performance of other covered tasks such as the following.:

- Locate Line (reference Reference Task 14.1).
- Install, Inspect, and Maintain Temporary Marker (reference Reference Task 14.5).

2.0 Knowledge Component

This activity is performed to prevent damage to submerged or buried pipelines during excavation activities. An individual performing this task must have knowledge of the following.:

- Operator Damage Prevention Program, including the requirement for compliance with the One-Call system and the required on-site temporary markings of facilities within the area of excavation.
- Allowable positioning of equipment, materials, and/or supplies at the excavation site as not to produce unacceptable stress loads on buried structures or excavations.
- Operator procedures, specifications, or methodology for excavation criteria or process, which may include but is not limited to:
  - tolerance zones,
  - hand excavations requirements,
  - pothole requirements for facility identification,
  - soft excavation requirements (e.g. vacuum or water jet excavation).
- Damage and injury prevention requirements for an unattended excavation site.
- Types of equipment and/or tools that are appropriate for the excavation, which may can include but is not limited to:
  - heavy excavation equipment,
  - jackhammer,
  - vacuum excavator,
  - shovels and hand tools.

Terms applicable to this task are as follows.:

excavation
Any operation using nonmechanical or mechanized equipment, demolition, or explosives in the movement of earth, rock, or other material below existing grade.

tolerance zone
The space in which a line or facility is located and in which hand digging or other noninvasive excavation

methods may be necessary~~special care is to be given~~.

Abnormal operating conditions (AOC)~~s~~ associated with the performance of this task include~~ the following.~~:

AOC Recognition	AOC Reaction
Pipeline is hit during the excavation.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Unplanned or preexisting release of hazardous liquid or gas.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Discovery of damage to an underground pipeline facility, including but not limited to: - coating, - casing, - conduits, - any communication or protection device.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Discovery of an unexpected foreign structure in the area of excavation.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.
Insufficient support for the pipeline during excavation.	Stop task activities, move to a safe distance, and notify appropriate pipeline personnel.

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps~~.~~:

Step	Action	Explanation
1	Verify that the pipeline has been located and marked.	Markings may be paint, flag, or other standard indicators of pipeline location.
2	Ensure that notification has been made to the control center or local operations at the beginning of work.	Operations personnel should closely monitor pipeline pressure and flow during excavation activities.
3	Identify an appropriate location for excavated material ~~(soil) to ensure that it is not placed in a location that could affect the integrity of the pipeline.~~	The spoil should not be placed in a location that could affect the integrity of the pipeline. Provide adequate distance from the excavation to ensure the integrity of the excavation, prevent excessive stress on the pipeline, and prevent pipeline damage because of collapse.
4	Identify the ~~marked and potentially unmarked~~ hazards surrounding the excavation site~~ (including underground hazards)~~.	Observes for irregularities. Ensures hazards are avoided and prevents damage to the line or any appurtenances. Hazards may be marked, unmarked, or underground.
5	Determine and communicate to excavator the required tolerance zone and any site-specific ~~operator~~ Operator requirements.	Adherence to tolerance zones reduces the probability that the pipeline will be hit. Site-specific ~~operator~~ Operator requirements may include, but are not limited to, the use of a flat bar, spotter, ~~and/~~or equipment preparation.

6	Ensure that the tolerance zone is maintained during excavation. Require hand digging or other noninvasive excavation methods of the remaining soil within the tolerance zone.	Use of hand tools, vacuum excavation, or other noninvasive methods minimizes the probability of damage when excavating near the pipe.
7	Confirm that the pipe is supported as necessary during and after excavation.	Proper pipe support helps prevent pipe sag or other conditions that could affect the integrity of the pipe.
~~7~~8	Notify control center or local operations at the completion of work.	Ensure the line is monitored during and after excavation activities.
~~8~~9	Document the excavation per ~~operator~~ Operator procedures.	Documentation about the excavation may include, but is not limited to, the following: - date; - location (line segment, mile post, etc.); - name of excavator; - purpose of excavation; - scope of excavation (size, extent, etc.); - One-Call information, if required; - depth of cover.

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

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 (also known as a “holiday”).
- Each length of pipe with a nominal outside diameter of $4^1/_2$ 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
The maximum pressure at which a pipeline or segment of a pipeline or a component may be normally operated.

Abnormal operating conditions (AOC) ~~AOCs~~ associated with the performance of this task include ~~the following.~~:

AOC Recognition	AOC Reaction
Mechanical, corrosion, or coating damage is present on component.	Make appropriate notifications according to Operator's procedures.
~~*This section intentionally left blank.*~~	~~*This section intentionally left blank.*~~

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps~~.~~:

Step	Action	Explanation
1	Visually inspect pipe and components for: corrosion; —- defects such as cracks, grooves, gouges, dents, or out-of-round pipe; —- coating damage; —- 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.	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. Complete all required documentation and notifications according to Operator procedures.

Task 38.3—Perform Visual Inspection of Welds

1.0 Task Description

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

This task begins with identifying any conditions that do not meet the qualified welding procedure or the 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: ~~the following.~~

- Perform NDT—Radiographic Testing (~~reference~~ Reference Task 38.4).
- Perform NDT—Liquid Penetrant Testing (~~reference~~ Reference Task 38.5).
- Perform NDT—Magnetic Particle Testing (~~reference~~ Reference Task 38.6).
- Perform NDT—Ultrasonic Testing (~~reference~~ 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.~~

- The inspection of welds and identification of conditions as defined by the DOT-approved edition of API 1104 and the ~~operator's~~ Operator's applicable written welding procedure(s) are limited to conditions that can be identified visually ~~and include the following terms~~.

Terms applicable to this task ~~are as follows.~~:

arc burns
These ~~O~~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. 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
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.

qualified welding procedure
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.

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.

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.

Abnormal operating conditions (AOC) ~~AOCs~~ associated with the performance of this task include ~~the following.~~:

AOC Recognition	AOC Reaction
Mechanical, corrosion, or coating damage is present on component.	Make appropriate notifications according to Operator's procedures.
~~*This section intentionally left blank.*~~	~~*This section intentionally left blank.*~~

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps~~.~~:

Step	Action	Explanation
1	Identify any conditions that do not meet the qualified welding procedure or the DOT-approved edition of API 1104. Conditions may include the following: - arc burn, - cracks, - external undercut (EU), - pinhole/porosity, - slag, - weld (cap) height—inadequate or excessive.	Arc burns and cracks are not acceptable and must be repaired. 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.