

 GEORGIA DEPARTMENT OF NATURAL RESOURCES ENVIRONMENTAL PROTECTION DIVISION	GEORGIA ENVIRONMENTAL PROTECTION DIVISION UNDERGROUND STORAGE TANK MANAGEMENT PROGRAM CATHODIC PROTECTION EVALUATION FORM FOR <u>IMPRESSED CURRENT SYSTEMS</u> Questions on how to complete this form should be directed to the EPD, UST Regulatory Compliance Unit at (404) 362-2687
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1. Impressed Current cathodic protection systems must be tested:
 - a. In accordance with the latest edition established by the NACE International (TM0101)
 - b. By a qualified cathodic protection tester within 6 month of installation and repair of any portion of the UST system, and every 3 years.
2. Please use photocopies of the appropriate pages if you have more than 4 tanks at any one location.
3. Please remove all pages that do not apply to the site.
4. The UST owner is required to keep a record of the last two (2) cathodic protection evaluation form the date of test, on a form acceptable to EPD.

I. OWNER INFORMATION	II. FACILITY INFORMATION
Owner:	Location Name:
Address:	Location (Facility) ID#:
City, State, Zip Code:	Address:
Phone Number:	City, County:

III. REASON SURVEY WAS CONDUCTED (mark only one)

- ☐ Installation of new tank
 ☐ Routine-3 year test
 ☐ Re-survey after repair/modification

Date next cathodic protection survey must be conducted: _____ (required every 3 years)

IV CATHODIC PROTECTION SURVEY RESULTS (*Impressed Current Systems*)

1. If any portion of the system fails, the system fails, and "Fail" should be marked below.
2. If a system repair is made, the report must be reviewed by a "Corrosion Expert" and the drawing must be sealed and signed by the "Expert".

☐ **PASS**

I certify that all structures at this facility "pass" the cathodic protection testing and in my best judgement, adequate cathodic protection has been provided to the UST system. No further action is necessary at this time.

☐ **FAIL**

I certify that one or more structures at this facility "fail" the cathodic protection testing and in my best judgement, adequate cathodic protection has NOT been provided to the UST system. The cathodic protection system must be repaired in accordance with a code of practice developed by a nationally recognized association or independent laboratory, and re-tested within 6 months following the repair, and signed by corrosion expert.

Tester Name:	Name of Company:
Certifying Organization (e.g., GTEC, STI, NACE, etc.):	Address:
Type of Certification:	City, State, Zip Code:
Date of Certification:	Phone Number:
Signature:	Date survey performed:

V. CORROSION EXPERT'S EVALUATION

The survey must be conducted and/or evaluated by a corrosion expert when: a) supplemental anodes or other changes in the construction of the impressed current system are made; b) stray current may be affecting buried metallic structures.

☐ **PASS**

I certify that all structures at this facility "pass" the cathodic protection testing and in my best judgement, adequate cathodic protection has been provided to the UST system. No further action is necessary at this time.

☐ **FAIL**

I certify that one or more structures at this facility "fail" the cathodic protection testing and in my best judgement, adequate cathodic protection has NOT been provided to the UST system. The cathodic protection system must be repaired in accordance with a code of practice developed by a nationally recognized association or independent laboratory, and re-tested within 6 months following the repair, and signed by corrosion expert.

Corrosion Expert Name:	Name of Company:
Corrosion Expert Certification:	Address:
Type of Certification/Certification Number:	City, State, Zip Code:
Signature:	Date: Phone #:

VI. DESCRIPTION OF CATHODIC PROTECTION SYSTEM REPAIRS AND/OR COMMENTS

1. If applicable, describe the repairs, other than to rectifier, in detail below and provide a sketch of the location and depth of any new anodes.
2. If applicable, describe repairs to rectifier below.
3. If repairs are made, provide the code of practice information below such as the NACE Standard SP0285-2011, "Standard Practice, and Corrosion Control of Underground Storage Tank Systems by Cathodic Protection.
4. If a system repair is made, the report must be reviewed by a "Corrosion Expert" and the drawing must be sealed and signed by the "Expert".

Association or Independent Laboratory:

Code of Practice Name:

Code of Practice Number:

Code of Practice Date:

☐ Additional Anodes for impressed current system (attach corrosion expert's designs).

☐ Repairs or replacement of rectifier (explain in section VII).

☐ Anode header cables repaired and/or replaced (explain in "comments/other, below).

☐ Negative cables or bonding repaired or replaced.

COMMENTS/OTHER:

VII. RECTIFIER INFORMATION (IMPRESSED CURRENT SYSTEMS)

1. Please complete all the information that is applicable.
2. Document repairs to the rectifier below.
3. Record DC output with portable meter and calibrate built-in meters
4. If rectifier has rotary rheostat, enter percentage in coarse settings
5. Please provide the "as left" measurements in amps.

Rectifier Manufacturer:

Rated DC Output: _____ volts _____ amps

Rectifier Model:

Rectifier Serial Number:

Rectifier output at last 3 year survey (if available): _____ volts _____ amps

Event	Date	Tap Settings		DC Output			Hour Meter Reading(If applicable)	Comments
		Coarse	Fine	Volts	Calculated Amps	Meter Reading		
"As Found"								
"As Left"								

VIII. IMPRESSED CURRENT ANODE CURRENT(IF SHUNT BOXES ARE PRESENT)

1. Complete if the system is designed to allow these measurements (i.e. individual lead wires for each anode and measurement shunts).
2. Be sure the values entered are amps and not in the mv unit.
3. If the rectifier ad justified, put your comment in the comment section below for that action.
4. If there are more than 10 shunts, use the "Comments" space below to record the additional shunt measurements.
5. Convert Reading between shunt prongs from MV to Amps(Note: wire shunt is 10mV=1A)

Anode (+)	1	2	3	4	5	6	7	8	9	10	Total Anodes current in amps
shunt prongs Reading MV											

Comments Concerning Operation, Maintenance, Repair of Rectifier

IX. UNDERGROUND STORAGE TANK FACILITY SITE DRAWING

1. In the space below, sketch the important parts of the facility such as tanks, manways, fill pipes, tank monitor, vapor recovery connections, piping, vents, drilled test ports, anodes, rectifier box, anode shunt box, pump islands, and buildings.
2. Indicate reference cell locations using location code "R" and sequential numbers (e.g. R1, R2) and structure contact points using the location code "S" and sequential numbers (e.g. S1, S2) as used in the tables on the following pages.
3. For each tank, tank include GA USTMP tank ID and product stored. Use the letter and number designations from the tables on the following pages to indicate reference cell locations and structure contact locations used for each measurement.

X. IMPRESSED CURRENT CATHODIC PROTECTION - TANK CONTINUITY TEST RESULTS

1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 3.
2. Record continuity test measurements using the "Fixed Cell, Moving Ground Technique", or the Point to Point "Potential Difference Technique".
3. When using the "Fixed Cell, Moving Ground Technique":
 - a. The reference cell must be placed in the soil at a location remote from the UST system (not within potential gradient of anodes or shielded by other tanks or structures) and left undisturbed until continuity testing is completed.
 - b. Only "Instant-Off Potential" measurements should be used to determine continuity.
4. When using the Point to Point "Potential Difference Technique", power to the rectifier should be turned off and the rectifier negative cable is disconnected.
5. If a continuity method fails to conclusively show continuity, another method may be used. If another method indicates continuity, the system passes.
6. Metallic structures are continuous when the "Instant-Off Potential" or "Off Potential" difference between two structures is 10 mv or less, isolated when greater than 10 mv.
7. All single and double wall metal tanks and piping, and all other metallic tank system structures which routinely contain product, must be Continuous with each other in order to pass the continuity test.

Location Code	Reference Cell Location and Structure Contact Points (Check all available points)	On Potential ❶ (negative millivolts)	Instant-Off Potential ❷ (negative millivolts)	Point to Point ❸ (millivolt difference)	Results Continuous Or Isolated	Comments
R	*					
	Rectifier Negative	- mv	- mv			
Tank (#), Grade of Product Stored , Size in Gallons						
S	(Tank bottom)(test lead)()**	- mv	- mv	mv		
S	Submersible pump	- mv	- mv	mv		
S	Fill pipe	- mv	- mv	mv		
S	Tank monitor	- mv	- mv	mv		
S	Vapor recovery connection	- mv	- mv	mv		
S	Vent line	- mv	- mv	mv		
S	Other ***	- mv	- mv	mv		
S	Other ***	- mv	- mv	mv		
Tank (#), Grade of Product Stored , Size in Gallons						
S	(Tank bottom)(test lead)()**	- mv	- mv	mv		
S	Submersible pump	- mv	- mv	mv		
S	Fill pipe	- mv	- mv	mv		
S	Tank monitor	- mv	- mv	mv		
S	Vapor recovery connection	- mv	- mv	mv		
S	Vent line	- mv	- mv	mv		
S	Other ***	- mv	- mv	mv		
S	Other ***	- mv	- mv	mv		
Tank (#), Grade of Product Stored , Size in Gallons						
S	(Tank bottom)(test lead)()**	- mv	- mv	mv		
S	Submersible pump	- mv	- mv	mv		
S	Fill pipe	- mv	- mv	mv		
S	Tank monitor	- mv	- mv	mv		
S	Vapor recovery connection	- mv	- mv	mv		
S	Vent line	- mv	- mv	mv		
S	Other ***	- mv	- mv	mv		
S	Other ***	- mv	- mv	mv		

❶ Record "On Potential" when using "Applied Current Technique".

❷ The lowest reading observed during a 2.5 or 3 second power interruption. Not required for Point to Point "Potential Difference Technique".

❸ Record "Point to Point "Potential Difference" when using Point to Point "Potential Difference Technique".

*Describe reference cell location for "Fixed Cell, Moving Ground Technique". N/A for Point to Point "Potential Difference Technique".

Indicate base structure contact point. Mark all that do NOT apply. **Make sure tank is not internally lined before using tank bottom.

***Describe location of any other contact points measured.

XI. IMPRESSED CURRENT CATHODIC PROTECTION- TANK STRUCTURE-TO-SOIL TEST RESULTS

1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 3.
2. For tanks, a minimum of **3 voltage measurements** must be taken; one while the reference cell is placed in the soil as close to the middle of the tank as possible and the others while the reference cell is placed in the soil as close as possible to each end of the tank (but not directly over anodes).
3. All single and double wall metal tanks and piping, and all metallic tank system structures which routinely contain product, must have "Instant-Off Voltage" measurements equal to or more negative than -850 mv, or have "Voltage Change" differences of at least 100 mv to be protected from corrosion and pass the structure-to-soil test.

Location Code	Structure Contact Point and Reference Cell Locations	On Voltage (negative millivolts)	Instant-Off Voltage ^① (negative millivolts)	Ending Voltage ^② or Native Voltage ^③ (negative millivolts)	Voltage Change ^④ (millivolts)	Results (Check the one that applies)
Tank (#)						
S	(Tank bottom)(test lead)()*					
R	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
Tank (#)						
S	(Tank bottom)(test lead)()*					
R	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
Tank (#)						
S	(Tank bottom)(test lead)()*					
R	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
Tank (#)						
S	(Tank bottom)(test lead)()*					
R	Soil near submersible pump manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near tank monitor manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vapor recovery manway	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil near vent riser	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)

- ① The lowest reading observed during a 2.5 or 3 second power interruption.
- ② After power interruption, the first reading that is at least 100 mv lower than the "Instant-Off Voltage" measurement.
- ③ The structure-to-soil potential prior to cathodic protection being applied. This may only be used to determine the "Voltage Change" at startup of the corrosion protection system.
- ④ The difference between the "Instant-Off Voltage" and the "Ending Voltage" or "Native Voltage".
- *Indicate base structure contact point. Cross out all that do NOT apply. Make sure tank is not internally lined before using tank bottom.
- ** Describe the location of the drilled test ports for any other reference cell location used.

XII. IMPRESSED CURRENT-METAL PRODUCT PIPING CONTINUITY TEST RESULTS

1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 3.
2. Record continuity test measurements using the "Fixed Cell, Moving Ground Technique", or the Point to Point "Potential Difference Technique".
3. When using the "Fixed Cell, Moving Ground Technique":
 - a. The reference cell must be placed in the soil at a location remote from the UST system (not within potential gradient of anodes or shielded by other tanks or structures) and left undisturbed until continuity testing is completed.
 - b. Only "Instant-Off Potential" measurements should be used to determine continuity.
4. When using the Point to Point "Potential Difference Technique", power to the rectifier should be turned off and the rectifier negative cable is disconnected.
5. If a continuity method fails to conclusively show continuity, another method may be used. If another method indicates continuity, the system passes.
6. Metallic structures are continuous when the "Instant-Off Potential" or "Off Potential" difference between two structures is 10 mv or less, isolated when greater than 10 mv. **Compare results with Rectifier negative.**
7. **All single and double wall metal tanks and piping, and all other metallic tank system structures which routinely contain product, must be continuous with each other in order to pass the continuity test.**

Location Code	Reference Cell Location and Structure Contact Points (Check all available points)	On Voltage Potential❶ (negative millivolts)	Instant-Off Potential❷ (negative millivolts)	Point to Point ❸ (millivolt difference)	Results Continuous or Isolated	Comments
Rec(-)	*					
Tank (# _____), Metal Piping, Type of Metal (steel) (copper)(_____) Approximate Length of Piping in Feet _____						
S _____	(Piping(flex conn.) at STP _____)**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	Other _____***	-	mv	-	mv	
S _____	Other _____***	-	mv	-	mv	
Tank (# _____), Metal Piping, Type of Metal (steel) (copper)(_____) Approximate Length of Piping in Feet _____						
S _____	(Piping(flex conn.) at STP _____)**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	Other _____***	-	mv	-	mv	
S _____	Other _____***	-	mv	-	mv	
Tank (# _____), Metal Piping, Type of Metal (steel) (copper)(_____) Approximate Length of Piping in Feet _____						
S _____	(Piping(flex conn.) at STP _____)**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	(Piping)(flex conn.) at dispenser # _____**	-	mv	-	mv	
S _____	Other _____***	-	mv	-	mv	
S _____	Other _____***	-	mv	-	mv	

❶ Record "On Potential" when using "Applied Current Technique"

❷ The lowest reading observed during a 2.5 or 3 second power interruption. Not required for Point to Point "Potential Difference Technique".

❸ Record "Point to Point "Potential Difference" when using Point to Point "Potential Difference Technique".

*Describe reference cell location for "Fixed Cell, Moving Ground Technique". N/A for Point to Point "Potential Difference Technique".

**Indicate piping and/or flex connector. Wrapped flex connector needs to be protected by spike anode. Cross out any that do NOT apply.

***Describe location of any other contact points measured.

XIV. IMPRESSED CURRENT-METAL PRODUCT PIPING STRUCTURE-TO-SOIL TEST RESULTS

1. The "Location Code" must be used to locate the reference cell and structure contact points on the drawing of the facility as discussed on page 3.
2. Piping voltage measurements should be taken with the reference cell in the soil at both ends of the piping run (but not directly over anodes), and if the run is longer than 100 feet, in the soil as close as possible to the middle of the piping run (but not directly over anodes).
3. All single and double wall metal tanks and piping, and all metallic tank system structures which routinely contain product, must have "Instant-Off Voltage" measurements equal to or more negative than -850 mv, or have "Voltage Change" differences of at least 100 mv to be protected from corrosion and pass the structure-to-soil test.

Location Code	Structure Contact Point and Reference Cell Locations	On Voltage (negative millivolts)	Instant-Off Voltage ^❶ (negative millivolts)	Ending Voltage ^❷ or Native Voltage ^❸ (negative millivolts)	Voltage Change ^❹ (millivolts)	Results (Check the one that applies)
Tank (#) Metal Piping						
S	(Tank bottom)(test lead)()*					
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil at middle of piping run	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
Tank (#) Metal Piping						
S	(Tank bottom)(test lead)()*					
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil at middle of piping run **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
Tank (#) Metal Piping						
S	(Tank bottom)(test lead)()*					
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil at middle of piping run **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)
Tank (#) Metal Piping						
S	(Tank bottom)(test lead)()*					
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil under dispenser # **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Soil at middle of piping run **	- mv	- mv	- mv	+ mv	(pass) (fail)
R	Other **	- mv	- mv	- mv	+ mv	(pass) (fail)

- ❶ The lowest reading observed during a 2.5 or 3 second power interruption.
- ❷ After power interruption, the first reading that is at least 100 mv lower than the "Instant-Off Voltage" measurement.
- ❸ The structure-to-soil potential prior to cathodic protection being applied. This may only be used to determine the "Voltage Change" at startup of the corrosion protection system.
- ❹ The difference between the "Instant-Off Voltage" and the "Ending Voltage" or "Native Voltage".

*Indicate base structure contact point. Mark all that do NOT apply. Make sure tank is not internally lined before using tank bottom.

** Describe the location of the drilled test ports for any other reference cell location used.

- | UST OWNER | | UST FACILITY | |
|-----------|--------|--------------|---------|
| NAME: | | NAME: | ID # |
| ADDRESS: | | ADDRESS: | |
| CITY: | STATE: | CITY: | COUNTY: |

Rectifier Manufacturer:	Rated DC Output: _____ VOLTS _____ AMPS
Rectifier Model:	Rectifier Serial Number:

60-DAY LOG OF RECTIFIER OPERATION

EPD, UST MANAGEMENT PROGRAM