



Underground Storage Tank Management Division Impressed Current Cathodic Protection System Evaluation

- This form must be utilized to evaluate underground storage tank (UST) cathodic protection systems in South Carolina.
- Access to the soil directly over the cathodically protected structure that is being evaluated must be provided.
- A site drawing depicting the UST cathodic protection system and all reference electrode placements must be completed.

I. UST OWNER		II. UST FACILITY	
Name:		Name:	ID#:
Address:		Address:	
City:	State:	City:	County:
III. CP TESTER		IV. CP TESTER'S QUALIFICATIONS	
Tester's Name:		NACE International Certification #:	
Company Name:		Certification Date:	Type of Certificate:
Address:		Source of Certification:	
City:	State:	Other (Explain):	
V. REASON SURVEY WAS CONDUCTED (mark only one)			
<input type="checkbox"/> Routine-3 year <input type="checkbox"/> Routine-within 6 months of installation <input type="checkbox"/> 60-day re-survey after fail <input type="checkbox"/> Re-survey after repair/modification Date next cathodic protection survey must be conducted by _____(required within 6 months of installation/repair & every 3 years thereafter)			
VI. CATHODIC PROTECTION TESTER'S EVALUATION (mark only one)			
<input type="checkbox"/> PASS All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).			
<input type="checkbox"/> FAIL One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (complete Section IX).			
<input type="checkbox"/> INCONCLUSIVE The cathodic protection survey of an impressed current system must be evaluated by a corrosion expert because one or more of the conditions listed in Section 7.1.5 of the SCDHEC cathodic protection guidance document are applicable (indicate what action is necessary by completion of Section IX).			
CP Tester's Signature:		Date CP Survey Performed:	
VII. CORROSION EXPERT'S EVALUATION (mark only one)			
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 or c) an inconclusive result was indicated in Section VI.			
<input type="checkbox"/> PASS All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).			
<input type="checkbox"/> FAIL One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (indicate what action is necessary by completion of Section IX).			
Corrosion Expert's Name:		Company Name:	
NACE International Certification:		NACE International Certification #:	
Corrosion Expert's Signature:		Date:	
VIII. CRITERIA APPLICABLE TO EVALUATION (mark all that apply)			
<input type="checkbox"/> 850 OFF Structure-to-soil potential more negative than -850 mV with respect to a Cu/CuSO ₄ reference electrode with the protective current temporarily interrupted (instant-off).			
<input type="checkbox"/> 100 mV POLARIZATION Structure(s) exhibit at least 100 mV of cathodic polarization.			
IX. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (mark only one)			
<input type="checkbox"/> NONE Cathodic protection is adequate. No further action is necessary at this time. Test again by no later than (see Section V).			
<input type="checkbox"/> REPAIR Cathodic protection is not adequate. Repair/modification is necessary as soon as practical but within the next 30 days.			
<input type="checkbox"/> RETEST Cathodic protection may not be adequate. Retest within 30 days or 6 months following a repair to determine if passing results can be achieved.			

X. DESCRIPTION OF UST SYSTEM

Tank #	PRODUCT	CAPACITY	TANK MATERIAL	PIPING MATERIAL	FLEX CONNECTORS
1					
2					
3					
4					
5					
6					
7					
8					

XI. IMPRESSED CURRENT RECTIFIER DATA (complete all applicable)

In order to conduct an effective evaluation of the cathodic protection system, a complete evaluation of rectifier operation is necessary.

Rectifier Manufacturer: _____ Rate DC Output: _____ volts _____ amps

Rectifier Model: _____ Rectifier Serial Number: _____

Rectifier Output as Initially Designed or Lastly Recommended (if available): _____ volts _____ amps

Event	Date	Tap Settings		DC Output		Hour Meter	Comments
		Coarse	Fine	Volts	Amps		

XII. IMPRESSED CURRENT POSITIVE & NEGATIVE CIRCUIT MEASUREMENTS (output amperage)

Complete if the system is designed to allow such measurements (i.e. individual lead wires for each anode are installed and measurement shunts are present).

Circuit	1	2	3	4	5	6	7	8	9	10	Total Amps
Anode (+)											
Tanks (-)											

XIII. DESCRIPTION OF CATHODIC PROTECTION SYSTEM REPAIRS AND/OR MODIFICATION

Complete if any repairs or modifications to the cathodic protection system are made OR are necessary. Certain repairs/modifications as explained in the text of the SCDHEC cathodic protection guidance document are required to be designed and/or evaluated by a corrosion expert (completion of Section VII required).

- Additional anodes for an impressed current system (attach corrosion expert's design).
- Repairs or replacement of rectifier (explain in "Remarks/Other" below).
- Anode header cables repaired and/or replaced (explain in "Remarks/Other" below).
- Impressed current protected tanks/piping not electrically continuous (explain in "Remarks/Other" below).

Remarks/Other: _____

XIV. UST FACILITY SITE DRAWING

Attach detailed drawing of the UST and cathodic protection systems. Sufficient detail must be given in order to clearly indicate where the reference electrode was placed for each structure-to-soil potential that is recorded on the survey forms. Any pertinent data must also be included. At a minimum you should indicate the following: All tanks, piping and dispensers; All buildings and streets; All anodes and wires; Location of CP test stations; Each reference electrode placement must be indicated by a code (1,2,3 R-1, R-2, R-3... etc.) corresponding with the appropriate line number in Section XVI of this form.

AN EVALUATION OF THE CATHODIC PROTECTION SYSTEM IS NOT COMPLETE WIHTOUT AN ACCEPTABLE SITE DRAWING.

XV. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM CONTINUITY SURVEY

- This section may be utilized to conduct measurements of continuity on underground storage tank systems that are protected by cathodic protection systems.
- When conducting a fixed cell-moving ground survey, the reference electrode must be placed in the soil at a remote location and left undisturbed.
- Conduct point-to-point test between any two structures for which the fixed cell-moving ground survey is inconclusive or indicates possible isolation.
- For impressed current systems, the protected structure must be continuous with all other protected structures in order to pass the continuity survey.

Facility Name: _____

NOTE: The survey is not complete unless all applicable parts of Sections I-XIV are also complete.

Describe Location of "Fixed Remote" Reference Electrode Placement:

Structure "A" ¹	Structure "B" ²	Structure "A" ³ Fixed Remote Instant Off Voltage	Structure "B" ⁴ Fixed Remote Instant Off Voltage	Point-to-Point ⁵ Voltage Difference	Isolated/ ⁶ Continuous/ Inconclusive
(example) Plus Tank Bottom	(example) Plus Steel Product Line @ STP	(example) -915 mV	(example) -908 mV		(example) Inconclusive
(example) Plus Tank Bottom	(example) Plus Steel Product Line @ STP			(example) 1 mV	(example) Continuous

1 Describe the protected structure ("A") that you are attempting to demonstrate is continuous (e.g. plus tank bottom).
 2 Describe the "other" protected structure ("B") that you are attempting to demonstrate is continuous (e.g. plus steel product line @ STP).
 3 Record the fixed remote instant off structure-to-soil potential of the protected structure ("A") in millivolts (e.g. -915 mV).
 4 Record the fixed remote instant off structure-to-soil potential of the "other" protected structure ("B") in millivolts (e.g. -908 mV).
 5 Record the voltage difference observed between structure "A" and structure "B" when conducting "point-to-point" testing (e.g. 1 mV).
 6 Document whether the test (fixed cell and/or point-to-point) indicated the protected structure was isolated, continuous, or inconclusive.

XVI. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM SURVEY

- This section may be utilized to conduct a survey of an impressed current cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly above the structure that is being tested and as far away from any active anode as practical to obtain a valid structure-to-soil potential (refer to SCDHEC cathodic protection evaluation guidance document for detailed discussion of electrode placement).
- Both on and instant off potentials must be measured for each structure that is intended to be under cathodic protection.
- The instant off potential must be –850 mV or more negative or the 100 mV polarization criterion must be satisfied in order to pass.

Facility Name: _____ NOTE: The survey is not complete unless all applicable parts of Sections I-XIV are also completed.

Location Code ¹	Structure ²	Contact Point ³	Reference Cell Placement ⁴	On Voltage ⁵	Instant Off Voltage ⁶	100 m V Polarization		Pass/Fail ⁹
						Ending Voltage ⁷	Voltage Change ⁸	
(example) 1	(example) Plus Tank	(example) Tank Bottom	(example) Soil @ Reg. STP	(example) -1070 mV	(example) -875 mV			(example) PASS
(example) 2	(example) Diesel Pipe	(example) Dispenser 7/8	(example) Soil @ Reg. STP	(example) -810 mV	(example) -680 mV	(example) -575 mV	(example) 105 mV	(example) PASS

Comments: _____

- 1 Designate numerically or by code on the site drawing each local reference electrode placement (e.g. 1,2,3... T-1, T-2, P-1, P-2, etc.).
- 2 Describe the structure that is being tested (e.g. plus tank; diesel piping; flex connector, etc.).
- 3 Describe where the structure being tested is contacted by the test lead (e.g. plus tank bottom; diesel piping @ dispenser 7/8, etc.).
- 4 Describe the exact location where the reference electrode is placed for each measurement (e.g. soil @ regular STP; soil @ dispenser 2, etc.).
- 5 (Applies to all tests) Record the structure-to-soil potential (voltage) observed with the current applied (e.g. –1070 mV).
- 6 (Applies to all tests) Record the structure-to-soil potential (voltage) observed when the current is interrupted (e.g. 680 mV).
- 7 (Applies to 100 mV polarization test only) Record the voltage observed at the end of the test period (e.g. 575 mV).
- 8 (Applies to 100 mV polarization test only) Subtract the final voltage from the instant off voltage (e.g. 680 mV – 575 mV = 105 mV).
- 9 Indicate if the tested structure passed or failed one of the two acceptable criteria (850 instant off or 100 mV polarization) based on your interpretation of data.