



EVALUATION OF THE VACUTECT ABOVE GROUND STORAGE TANK TEST SYSTEM

PREPARED FOR
TANKNOLOGY CORPORATION INTERNATIONAL

APRIL 27, 1992



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5225 HOLLISTER STREET
HOUSTON, TEXAS 77040-6294**

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PREFACE

In order to meet the growing demand for testing above ground storage tanks, Tanknology Corporation International, Inc. has successfully applied their knowledge and expertise of leak detection in underground storage tanks to small above ground storage tanks. By applying minor equipment and protocol changes to the patented VacuTect tank test system, Tanknology has developed the VacuTect Above Ground Storage Tank Test system.

The VacuTect Above Ground Storage Tank Test system was evaluated to determine the ability of the system to find small leaks, in the area containing liquid, in an above ground storage tank. At this time there is no protocol, either by the U.S. EPA or an industry consensus group, that is known to outline a standard test or tests for above ground tanks. For this reason, the testing procedure was reviewed by Ken Wilcox Associates, Inc. and the testing was observed and recorded by Gregory E. Young, of Ken Wilcox Associates, Inc. Questions concerning the testing or the test results should be directed to John Tuma at Tanknology Corporation International, telephone number 713/895-6310.



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April 27, 1992

REPORT ON THE VACUTECT ABOVE GROUND STORAGE TANK TEST SYSTEM FOR TANKNOLOGY CORPORATION INTERNATIONAL

Introduction

The VacuTect Above Ground Storage Tank Test (VacuTect AGSTT) system is a modification of the same technology used by Tanknology to find leaks in underground storage tanks. The process to test an above ground storage tank is basically as follows.

The above ground storage tank has liquid approximately 12" deep in the tank. For this evaluation, 12 inches of water was used. The probe with the pressure sensor and acoustic listening device is lowered into the product approximately 6". The vacuum pump is attached to the tank via a hose. Leaks in valves or gaskets on the tank are repaired or replaced. Enough vacuum is applied to the ullage to overcome the static pressure of the product and create a -0.2 psi on the probe. When the vacuum pump is off, the operator listens to detect bubbles in the liquid. The vacuum should be maintained between -0.18psi and -0.20psi for an hour.

Description of the Test Site

The testing was performed on a steel above ground storage tank of undetermined age. The manufacturer identification plate on the tank had the following information on it:

manufactured by: White Tank Company, Albany, Texas
serial # 1480
bottom 1/4"
shell 3/16"
deck 3/16"
12' diameter x 20' high
400 barrel capacity

The tank had several valves, pipe openings and hatch coverings, including a 2' x 3' access port located on the side of the tank. The tank was filled with approximately 12" of water. The openings and valves were checked for leaks. If leaks were found they were sealed with either plumbers putty or grease. Inflatable plumbers plugs were used to close unused openings in the tank. As the tank was sitting on an oiled gravel pad, and no water was observed coming from under the tank, it was accepted the tank was free of leaks in the area filled with water.

Access to the top of the tank was obtained by means of a stairway and landing attached to the side of the tank. The vacuum hose and hydrophone equipment from the Tanknology truck were inserted into openings in the top of the tank. The hydrophone was

The normal test protocol would require initializing the system, drawing the pressure down to -0.2 psi, and monitor that pressure for one hour of testing. Due to time constraints, quick detection times, and the number of tests desired, this portion of the testing was performed without initializing the vacuum to -0.20 psi before every test. It was assumed by the operator that the residual vacuum from the previous tests would be sufficient for the remaining tests, and therefore vacuum was not monitored between tests. At the failure to detect, the vacuum was checked and found to have fallen to -0.16 psi. The desired level (-0.2 psi) was reestablished and the leak was detectable again. During tests #16 to #100 the operator checked the pressure between tests and the vacuum was reestablished as necessary, usually every 12 to 15 tests.

Discussion

The acoustics of the system is extremely sensitive. While this allows for positive identification of a leak in the above ground tank, it also means the test system will be sensitive to background noise at the test site. This is a variable the Vacutect operator is accustomed to dealing with.

Where water is pooled around the base of the tank, extended test time is required to determine water ingress.

Length of time to reach the desired vacuum (-0.2 psi) will be longer with gasoline or other chemicals with a low Reid vapor pressure than with water. Tanknology personnel have a great deal of experience with gasoline in underground storage tanks and may be able to provide historical data to estimate this time.

Table 1. Tests 1 through 4

Test No.	Test Time	Induced Leak	Tank Tight (yes/no)
1	4 m 17 s	yes	no
2	4 m 27 s	yes	no
3	4 n 30 s	no	yes
4	4 m 19 s	no	yes

Table 2. Tests 5 through 100

Test No.	Induced Leak	Tank Tight (yes/no)	Test No.	Induced Leak	Tank Tight (yes/no)	Test No.	Induced Leak	Tank Tight (yes/no)
5	L	no	37	L	no	69	T	yes
6	T	yes	38	L	no	70	L	no
7	L	no	39	L	no	71	L	no
8	L	no	40	T	yes	72	L	no
9	T	yes	41	T	yes	73	L	no
10	T	yes	42	L	no	74	T	yes
11	T	yes	43	T	yes	75	T	yes
12	L	no	44	L	no	76	T	yes
13	T	yes	45	L	no	77	L	no
14	T	yes	46	T	yes	78	T	yes
15	L	yes*	47	T	yes	79	T	yes
16	T	yes	48	L	no	80	T	yes
17	L	no	49	L	no	81	T	yes
18	T	yes	50	T	yes	82	L	no
19	T	yes	51	T	yes	83	L	no
20	L	no	52	T	yes	84	T	yes
21	L	no	53	T	yes	85	T	yes
22	T	yes	54	L	no	86	T	yes
23	T	yes	55	T	yes	87	L	no
24	L	no	56	L	no	88	L	no
25	T	yes	57	L	no	89	T	yes
26	T	yes	58	T	yes	90	T	yes
27	L	no	59	T	yes	91	L	no
28	L	no	60	L	no	92	L	no
29	T	yes	61	T	yes	93	L	no
30	L	no	62	T	yes	94	L	no
31	T	yes	63	L	no	95	T	yes
32	L	no	64	T	yes	96	L	no
33	T	yes	65	T	yes	97	L	no
34	T	yes	66	L	no	98	L	no
35	T	yes	67	L	no	99	L	no
36	L	no	68	T	yes	100	T	yes

* missed detection