UNIVERSITY OF
Lincoln

Safe Operating Procedure

UNDERGROUND STORAGE TANKS - AUTOMATIC TANK GAUGING

This Safe Operating Procedure (SOP) provides a summary of the Nebraska State Fire Marshal (SFM) automatic tank gauging (ATG) system requirements for Underground Storage Tanks (UST). Most UST systems at UNL (except exempt USTs) are equipped with ATG systems.

Overview of Automatic Tank Gauging (ATG) Systems
ATG is a leak detection method that uses automated processes to monitor product level and perform inventory control. Permanently installed sensors at the top of the fuel tank continuously measure product level and temperature, and a computer analyzes and records the information. ATG systems are often equipped with alarms for high and low product level, high water level, and theft. Overfill alarms may also be included in the ATG system.

ATG probes are connected to a monitor that displays the ongoing product level information and generates results of a monthly test. ATG monthly test records must be retained for five years by the operator in the on-site tank files.

ATGs can be set in multiple modes of operation:
- In the "inventory" mode, ATGs replace use of a stick to measure product and water levels and perform the inventory control function for the tank. This mode records the activities of "in-service" tanks, including fuel deliveries. This mode can be used to verify quantities of fuel received.

- In the "test" mode, the tank is taken out-of-service, and the product level and temperature are measured for at least one hour. This tests the tank for leaks and must be conducted on a monthly basis. ATG system tests typically must be conducted when the tank is at least 50% full. Some tanks must be at least 90% full for an accurate test. The operator’s manual will specify the exact requirements for a particular system.
  - Some systems, known as continuous ATGs, do not require tanks to be taken out-of-service to perform tests. Continuous ATG systems can gather and analyze data during many short time periods when no product is being added to or removed from the tank.
  - If the ATG system is not of the "continuous" type, product should not be delivered to the tank for at least 6 hours before beginning and during the test. Tests may take from 1 to 6 hours to complete.

Regulatory Design Requirements for ATG Systems

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ATGs must be able to detect a leak no larger than 0.1 gallons per hour given certain probabilities of detection (95%) and of false alarm (5%). If an ATG system was installed later than December 22, 1990, and does not meet the performance standard for minimum leak detection rate, then tank product inventory control or other equivalent test methods must be performed in addition to ATG.

**ATG Recordkeeping Requirements**
The following ATG records must be maintained on-site in the tank files for a minimum of five years:

- Monthly inventory control and/or tank gauging records. Each tank must demonstrate at least one valid test each month. Some tanks are set to automatically run tank gauging tests on a weekly basis.
- Monthly tank bottom water level records accurate to within 1/8 of an inch.
- The ATG system manufacturer’s operation manual, design specifications, and recommended calibration and maintenance schedules.
- Documentation of all calibrations, maintenance, and repairs. Calibration and maintenance must be conducted at the frequency specified by the manufacturer.
- Written performance claims or evaluations signed by a third-party evaluator verifying how the ATG system performed under test conditions.
- Records of follow-up investigations or third-party inspections after a failed monthly ATG system test.

**ATG Failure**
Notify EHS upon discovery of any tank system leaks, failed ATG monthly test, or malfunctions of an ATG system. Immediate action is required to investigate the malfunction or failure, with follow-up actions documented. In the case of a failure that indicates a release, certain notifications must be made. See EHS SOP, *Underground Storage Tanks – Petroleum Release Requirements*.

**Optional Overfill Alarms**
Tank owners and operators must ensure releases due to spilling and overfilling do not occur. First and foremost, verify the available tank volume is greater than the volume of product to be transferred into the tank before making the transfer. Constantly monitor the fuel transfer operation from start to end. Overfill alarms use probes installed in the tank to activate an alarm either when the tank is greater than 90% full of fuel or within 1 minute of the tank being overfilled when receiving a fuel delivery. The alarm may consist of a computerized notification process, trouble lights, and/or audio notifications. To be effective, an alarm should provide a fuel delivery truck driver adequate time to shut off incoming fuel before overfilling occurs. Alarms must be located where a fuel delivery truck driver can see them easily. Overfill alarms only work if they alert the driver at the right time and if the driver responds in a timely manner.