

### UNDERGROUND STORAGE TANKS - AUTOMATIC TANK GAUGING

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(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

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). All 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 must extend nearly to the bottom of the tank and must not be positioned so that they could be easily broken by tank operations. ATG probes are connected to a monitor that displays the ongoing product level information and generates results of a monthly test. Printers can be connected to ATG computer systems. Some of UNL's systems print out the information on two to three inch wide tapes. These printed ATG records must be retained for five years by the operator in the on-site tank files. In the event paper runs out or doesn't function, the ATG computers should be able to generate a new print out. ATGs can also be linked to computers at other remote locations, from which the programs can be monitored or read.

ATG systems are primarily used on gasoline and diesel fuel tanks with a capacity of up to 20,000 gallons. For tanks of greater than 20,000 gallons, contact the ATG manufacturer to verify that their ATG monitor will operate as required by regulation.

ATGs can be set in multiple modes of operation:

- In the "inventory" mode, ATGs replace the 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**

ATGs must be able to detect a leak no larger than 0.2 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 (i.e., Manter Hall and Animal Research Facility). The tape records are maintained on-site, generally with other required records (i.e., SPCC inspection records, etc.).
- 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.
- Written performance claims or evaluations signed by a third-party evaluator verifying how the ATG system performed under test conditions. Performance and operation of systems that have passed EPA's third party scrutiny can be found at: [http://www.epa.gov/oust/pubs/atg\\_0900.pdf](http://www.epa.gov/oust/pubs/atg_0900.pdf)
- 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***.

## **Additional Tips for ATG Systems**

Contractors installing, modifying, or repairing an ATG should provide the operator with the following:

- Training on proper operation of the ATG system.
- Information regarding the installation and confirmation that the ATG has been properly programmed and calibrated for the UST system.
- A copy of the ATG system operator's manual, with recommended schedules and procedures for calibrations, maintenance, third-party evaluations, and phone numbers for technical support.

## **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. For those UST systems subject to the provisions of UNL's SPCC Plan, all deliveries must be attended by UNL personnel.