Pipeline and Hazardous Materials Safety Administration
Office of Hazardous Materials Enforcement
Central Region

Separating Fact from Fiction Orientation Course

Bloomington, IL

Ag Retailer Compliance

Terry Pollard, Hazardous Materials Investigator

173.315(m) General (1)

- Private carrier for agricultural use only
- No packaging specifications required if;
- Minimum design pressure of 250 psig
- ASME code tank and is marked accordingly
- Equipped with a safety relief valve per CGA pamphlet S1.2
- Painted white or aluminum
- Has a capacity of 3,000 gallons or less
- Is loaded to a filling density of no more than 56 percent
- Securely mounted on a farm wagon
- Conforms with Part 172 except no shipping papers and need not be marked or placarded on one end if prevented by appertences

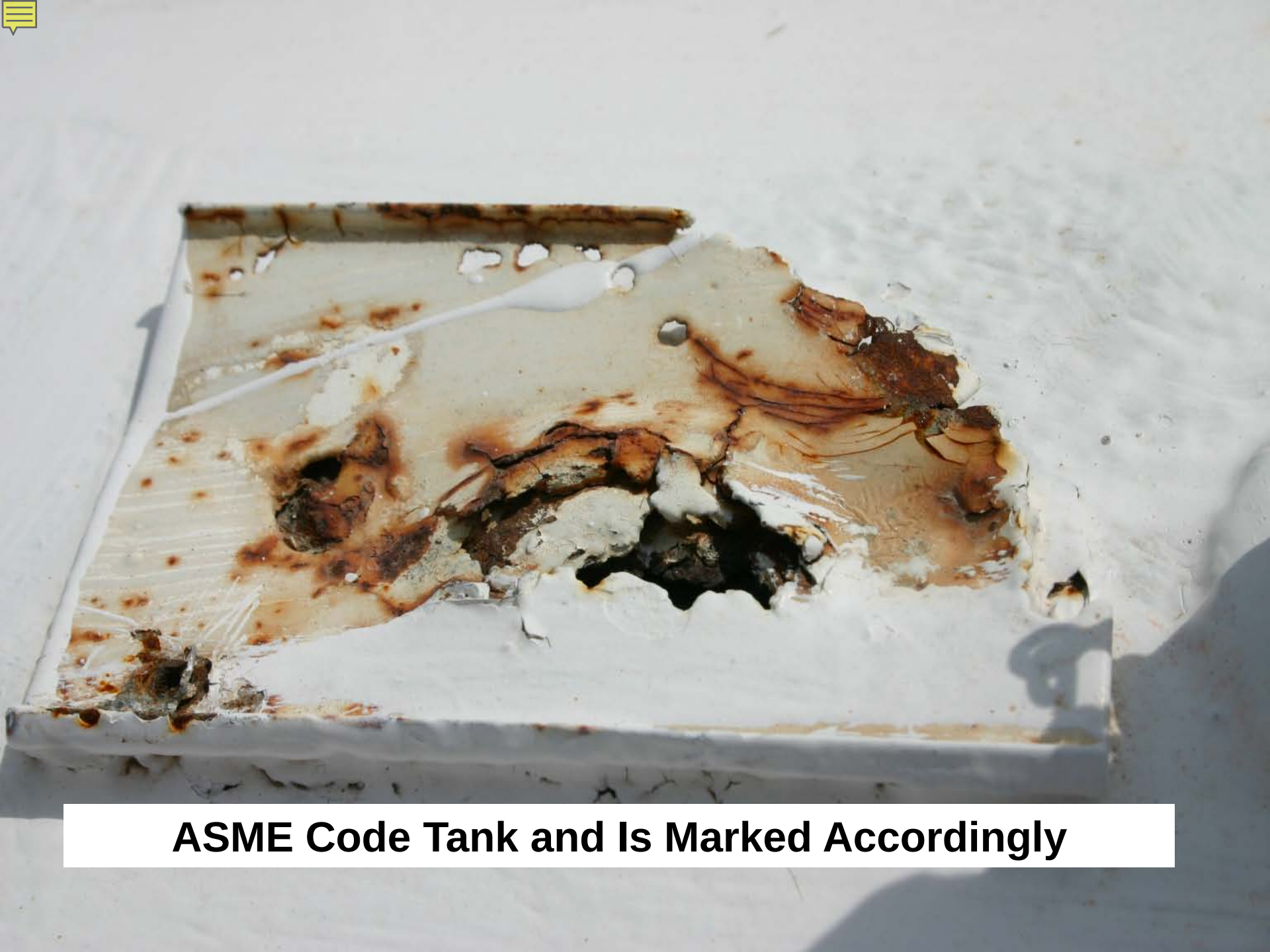
(2) Nurse tanks with missing or illegible ASME plates

- Tanks with missing or illegible ASME plates may be used if;
- Undergo an external visual inspection;
- Thickness test;
- Hydrostatic pressure test
- Inspections/tests must be completed every five years
- Tank must be marked with tests completed and month and year. The owner's unique identification number
- Test reports must be retained by tank owner

(3) Field Mounted Tanks

Used for Agricultural Purposes Only


PROPANE
1075
2
LP171
Used for Ammonia Service Only



ASME Code Tank and Is Marked Accordingly


ASME Code Tank and Is Marked Accordingly

What's Required To Be On a ASME Nameplate?

Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#14. Tank Nameplate

(NT, AP) = Applicator and nurse tank nameplate is the permanent documented identification. According to Code of Federal Regulations 173.315(m)(1) applicator and nurse tanks "*must have a minimum design pressure rating of 250 psi and meets the requirements of the edition of the ASME code in effect at the time it was manufactured and is MARKED ACCORDINGLY*". Determine if the nameplate is painted over requiring cleaning, illegible due to excessive wear, or completely removed from the tank.

Required nameplate markings per the ASME Code, Division 1, Section 8, UG116 through UG 116(b), for the years prior to 1988

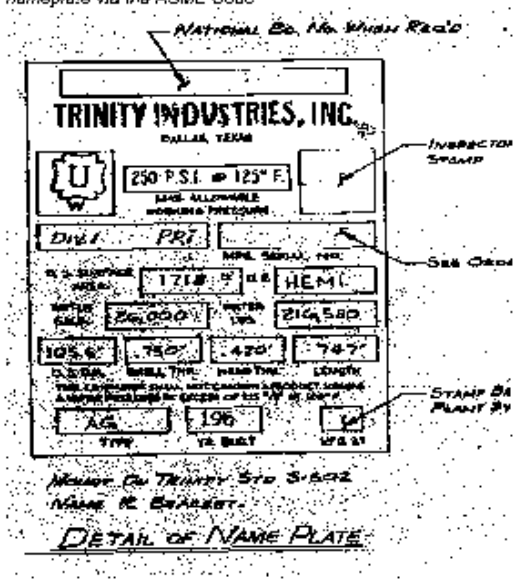
Nameplate Markings per the
Prior to the 1986 ASME Code/1988 Addendum

1. Name of Manufacturer;
2. Manufacturer's Serial No. (National Board No. optional);
3. Official Code "U" Symbol;
4. Maximum Allowable Working Pressure (MAWP);
5. Year Built; and

Nameplate Markings per the
1986 ASME Code/1988 Addendum to Present

1. Name of Manufacturer;
2. Manufacturer's Serial No. (National Board No. optional);
3. Official Code "U" Symbol;
4. Maximum Allowable Working Pressure (MAWP);
5. **Minimum Design Metal Temperature (MDMT)**
6. Year Built; and

Plant Built – For Trinity Steel or Industries tanks.
For MDA Use Only – Not explicitly required to be marked on nameplate via the ASME Code



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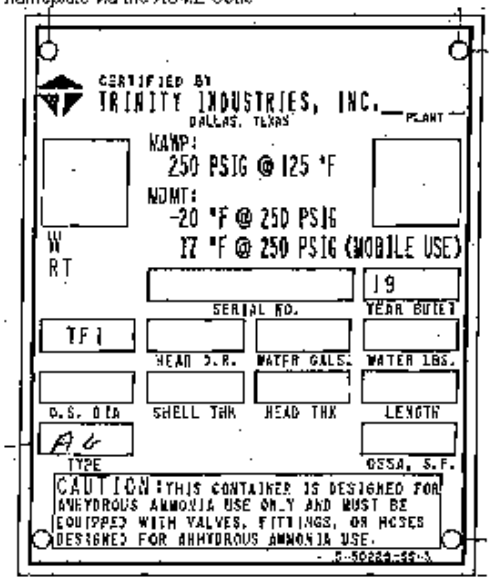
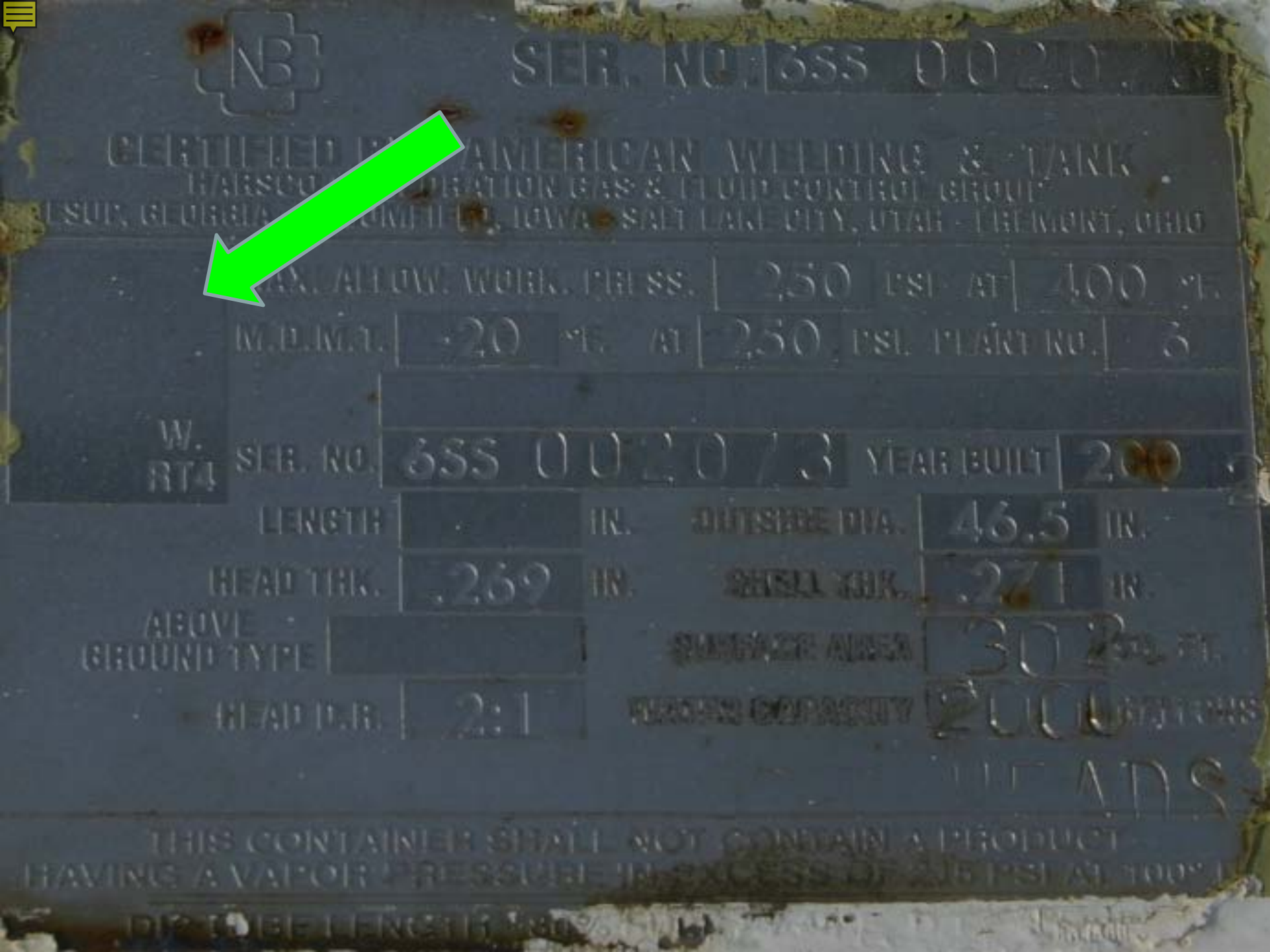


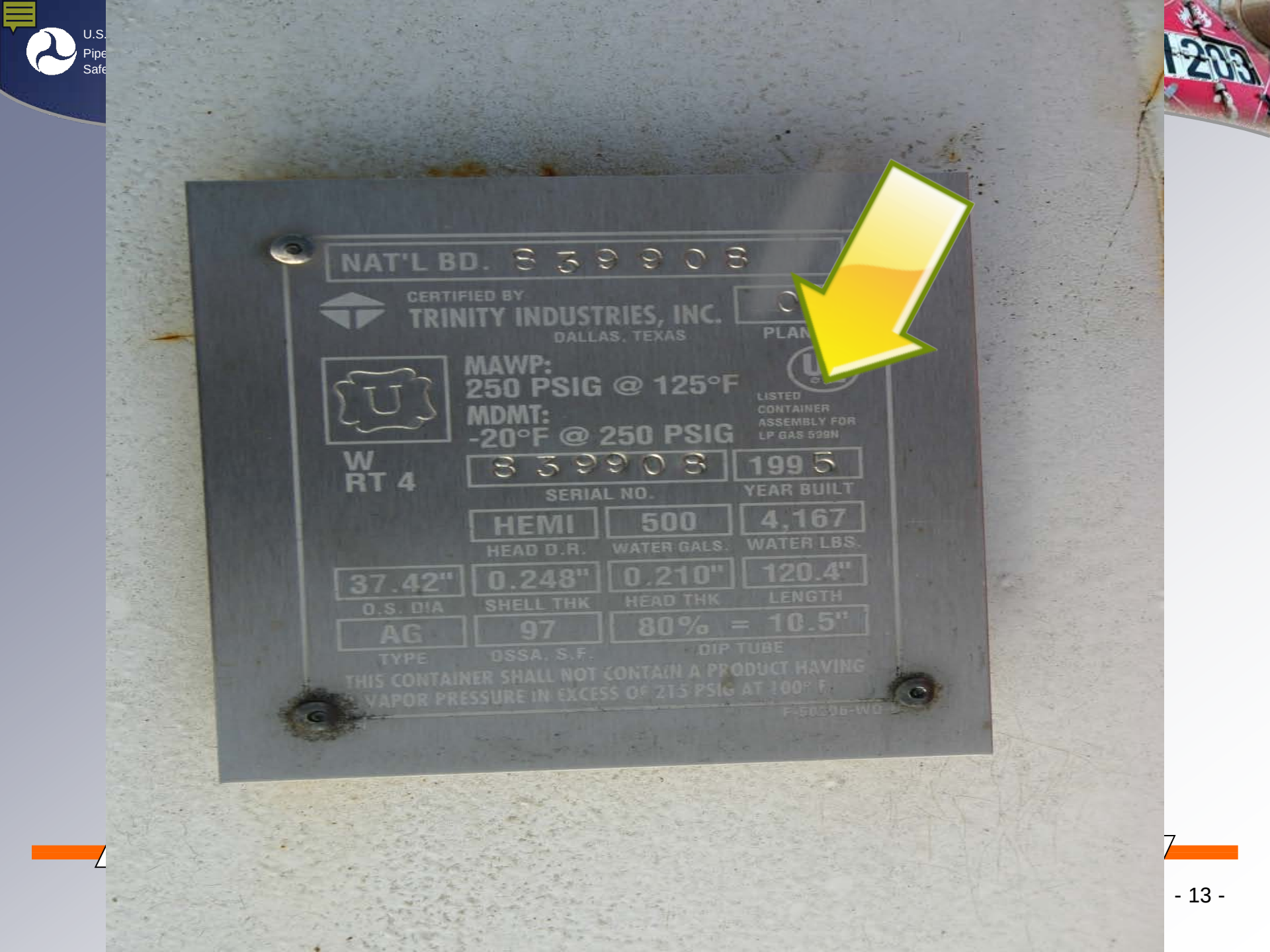
What to do when nameplate is illegible or missing?

1. Permanently remove tank from ammonia service
2. Re-stamp or replacement existing nameplate;
3. Federal DOT Special Permit, SP-13564

Information Required on a Nameplate

- The Official “U” stamp and symbol
- Name of the manufacturer
- MAWP in psig
- Minimal design metal temperature
- Manufacturer’s serial number
- Year built
- Type of construction used for the vessel (must list all)
- Vessels radiographed shall be marked

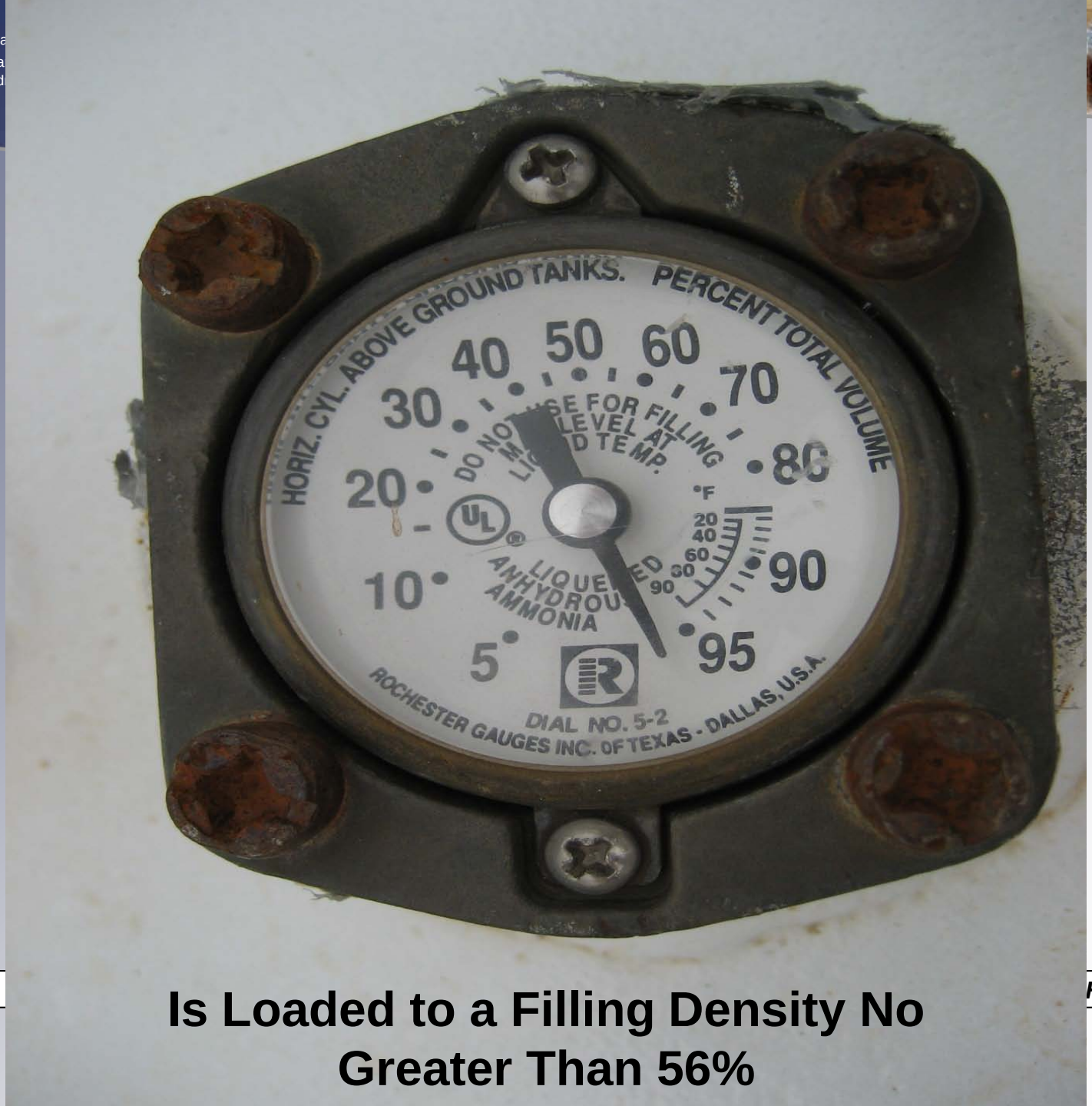

NB
SER. NO. 8SS 00 20
CERTIFIED BY AMERICAN WELDING & TANK
HARSCO CORPORATION GAS & FLUID CONTROL GROUP
SUF, GEORGIA, SUMTER, IOWA, SALT LAKE CITY, UTAH, FREMONT, OHIO
MAX. ALLOW. WORK. PRESS. 250 PSI AT 400 °F.
M.P.M.T. 20 °F. AT 250 PSI. PART NO. 3
W.
RT4
SER. NO. 8SS 00 20 73
YEAR BUILT 20
LENGTH IN.
OUTSIDE DIA. 46.5 IN.
HEAD THK. .269 IN.
SHELL THK. .271 IN.
ABOVE
GROUND TYPE
SURFACE AREA 30 SQ. FT.
HEAD D.R. 2:1
WATER CAPACITY 2000 POUNDS
ADS
THIS CONTAINER SHALL NOT CONTAIN A PRODUCT
HAVING A VAPOR PRESSURE IN EXCESS OF 265 PSI AT 100°
DIP TUBE LENGTH


NAT'L BD. 839908
CERTIFIED BY
TRINITY INDUSTRIES, INC.
DALLAS, TEXAS
MAWP:
250 PSIG @ 125°F
MDMT:
-20°F @ 250 PSIG
LISTED
CONTAINER
ASSEMBLY FOR
LP GAS 539N
W
RT 4
839908
SERIAL NO.
1995
YEAR BUILT
HEMI
HEAD D.R.
500
WATER GALS.
4,167
WATER LBS.
37.42"
O.S. DIA
0.248"
SHELL THK
0.210"
HEAD THK
120.4"
LENGTH
AG
TYPE
97
OSSA. S.F.
80% = 10.5"
DIP TUBE
THIS CONTAINER SHALL NOT CONTAIN A PRODUCT HAVING
VAPOR PRESSURE IN EXCESS OF 215 PSIG AT 100° F.

Equipped With a Safety Relief Valve per CGA Pamphlet S1.2


Be Painted White or Aluminum


Be Painted White or Aluminum



Is Loaded to a Filling Density No Greater Than 56%

Filling Density

- 1000 gallon nurse tank

Filling Density

- **1000 gallon nurse tank**
- **1000 x 8.33 (lbs/gallon of water) = 8,330 lbs**

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- 8,300 x .56 (56%) = 4,648 lbs
- 4,648 lbs divided by 5.15 lbs of NH3/gallon
- Equals 902 gallons of NH3

- 1000 gallon nurse tank
- 1000 x 8.33 (lbs/gallon of water) = 8,330 lbs
- 8,300 x .56 (56%) = 4,648 lbs
- 4,648 lbs divided by 5.15 lbs of NH3/gallon
- Equals 902 gallons of NH3
- 902 gallons of NH3 ÷ 1,000 gallon tank = 90.2%

Is Securely Mounted On A Farm Wagon


#3


Walgreens
DRIVE-THRU PHARMACY
Is Securely Mounted On A Farm Wagon
APR 23 2008


Is Securely Mounted On A Farm Wagon
APR 24 2008

Is Securely Mounted On A Farm Wagon


Is Securely Mounted On A Farm Wagon


Is Securely Mounted On A Farm Wagon

Placarding and/or Marking

Placarding and/or Marking

Placarding and/or Marking

Make Sure Your Placard Is 273 mm In Size


ANHYDROUS A
1005
1005

Placards and Marking are Required (Interpretation 10-0120)

Tanks May Not Leak

There will be no identifiable (without the use of instruments) release of hazardous materials to the environment


DANGER
CAUTION
ANHYDROUS AMMONIA (Under Pressure)
READ CAREFULLY
7. CLOSE VALVES FIRMLY BUT DO NOT "WRENCH".
8. DO NOT PERMIT CHILDREN NEAR THIS EQUIPMENT.

Weld Repairs May Jeopardize The Condition Of The Tank

173.24(b)(2) The effectiveness of the package will not be substantially reduced; for example, impact resistance, strength, packaging compatibility, etc…….


1203
100


INHALATION HAZARD
1005
2
CAUTION
AMMONIA
1203


2008 10 20


1005
2
AMMONIA
INHALATION HAZARD


INHA
HA

Note the differences in the thicknesses of the tank material and the patch


2008


1005
2
INHALATION HAZARD
ANHYDROUS AMMONIA
2008 12 17

Gouges, Dents, and Pitting

Serious dents, deep gouges, and pitting should be evaluated to determine if the tank is still safe for transportation


American Express
3759 876543 21001
YOUR NAME HERE


LIBERTY


TRANSPORT OF HAZARDOUS WASTES
LIBERTY
1-800-888-854


DEPARTMENT OF TRANSPORTATION
UNITED STATES


Holiday Inn
ahhhh...


1005


WATER
KORTOKVILLE
FARMERS SUPPLY
PHONE 556 3435
1005
1005
2


MAG 48235


2
AMMONIA

Stress Corrosion Cracking

Some nurse tank's catastrophic failures can be contributed to stress corrosion cracking


ANHYDROUS AMMONIA
1005
2


1203

Catastrophic Tank Failures

Minnesota – 2005

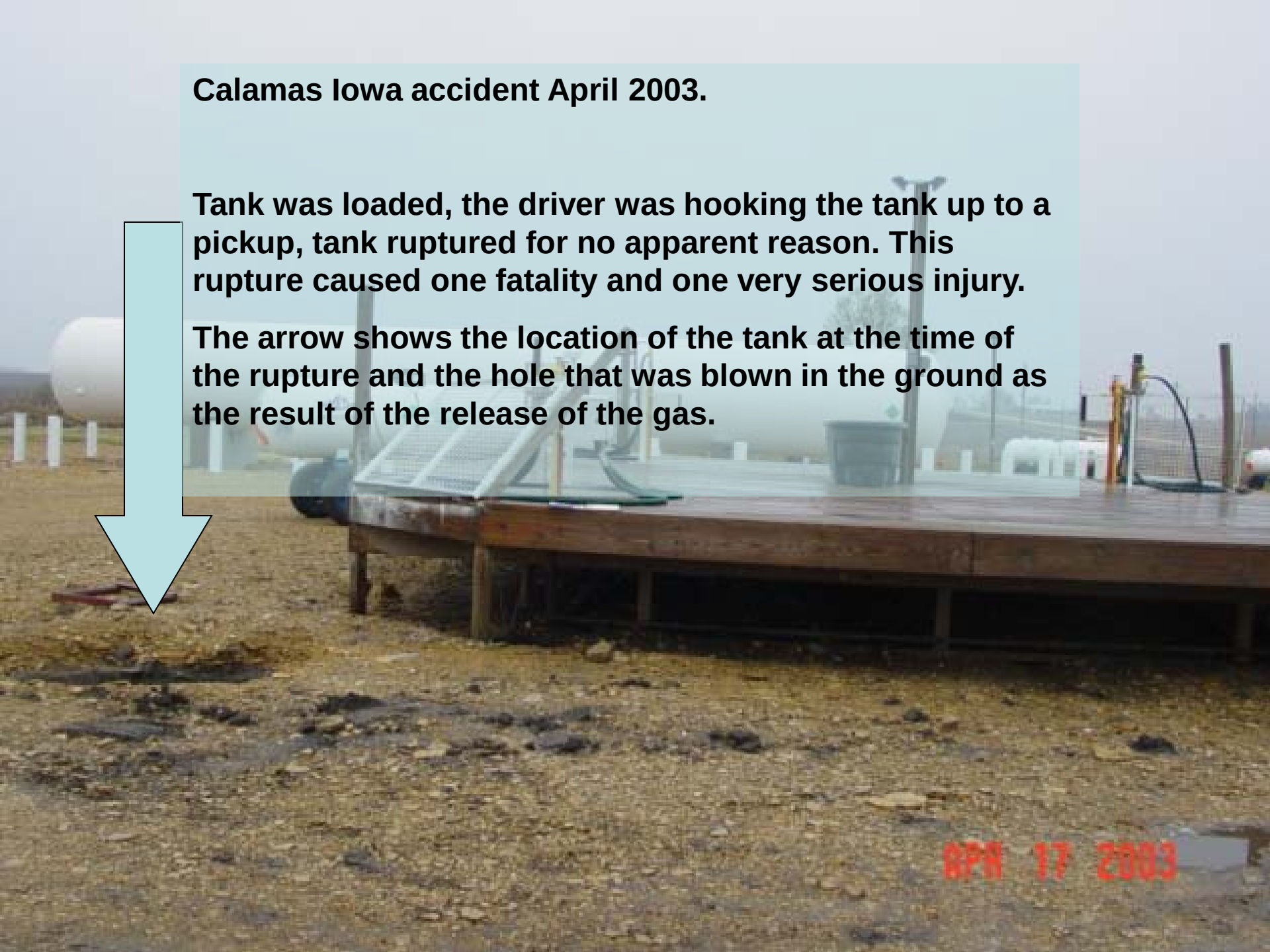
Calamas, Iowa – 2003

Grand Island, Nebraska – 2006

Dassel, Minnesota – 2007

Canada - ????

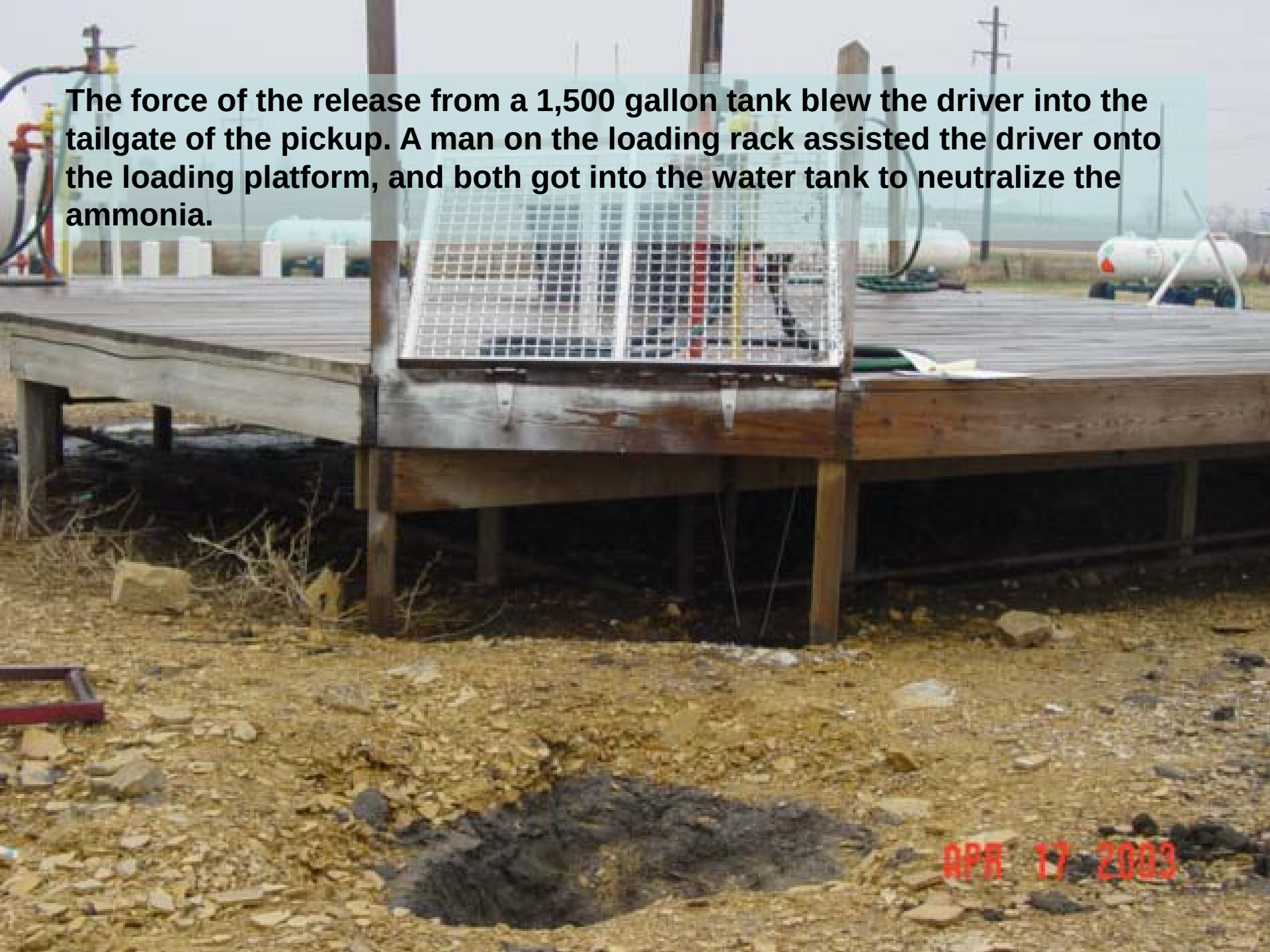
Minnesota 2005



Calamas Iowa accident April 2003.

Tank was loaded, the driver was hooking the tank up to a pickup, tank ruptured for no apparent reason. This rupture caused one fatality and one very serious injury.

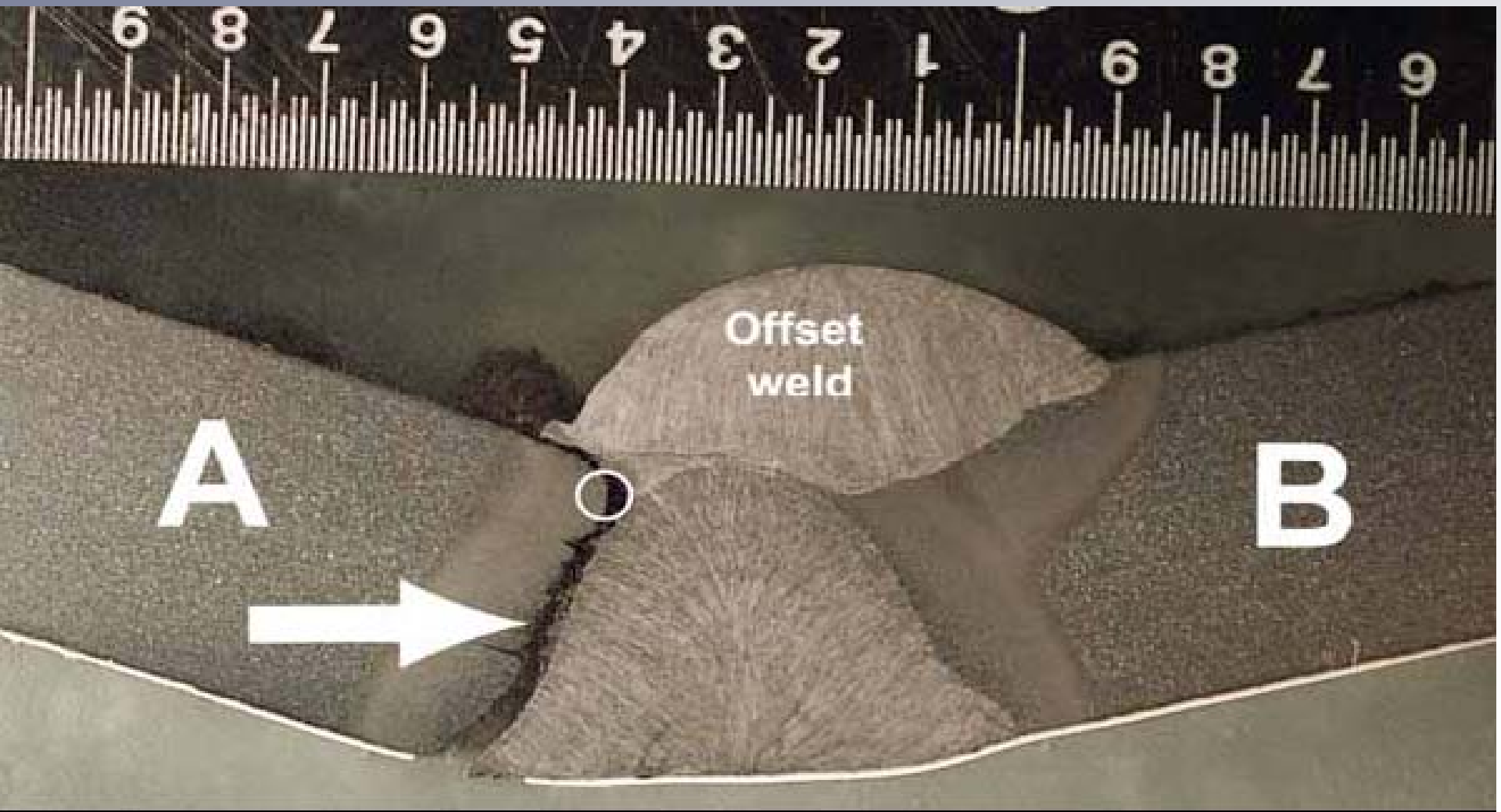
The arrow shows the location of the tank at the time of the rupture and the hole that was blown in the ground as the result of the release of the gas.

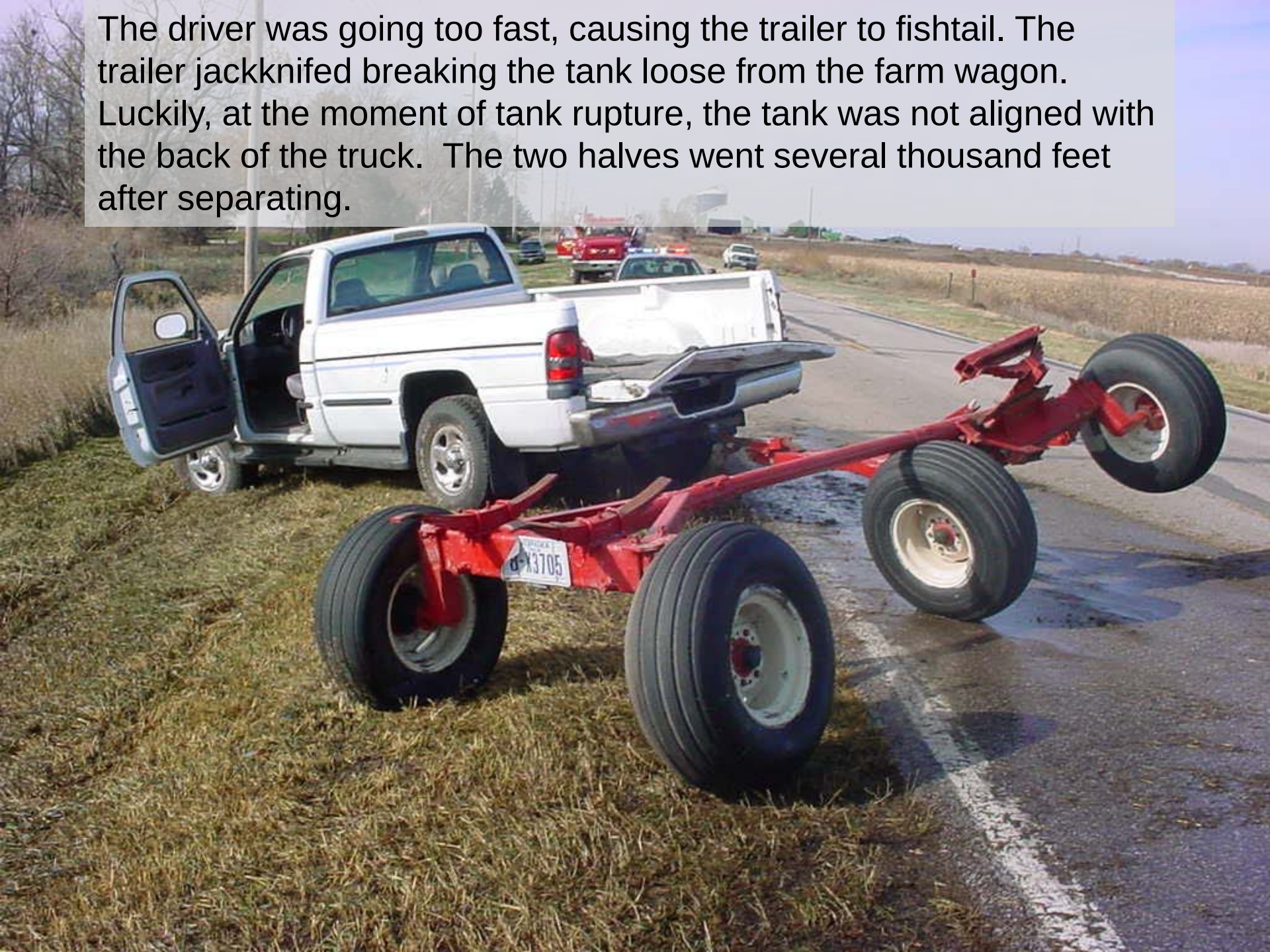


The force of the release from a 1,500 gallon tank blew the driver into the tailgate of the pickup. A man on the loading rack assisted the driver onto the loading platform, and both got into the water tank to neutralize the ammonia.

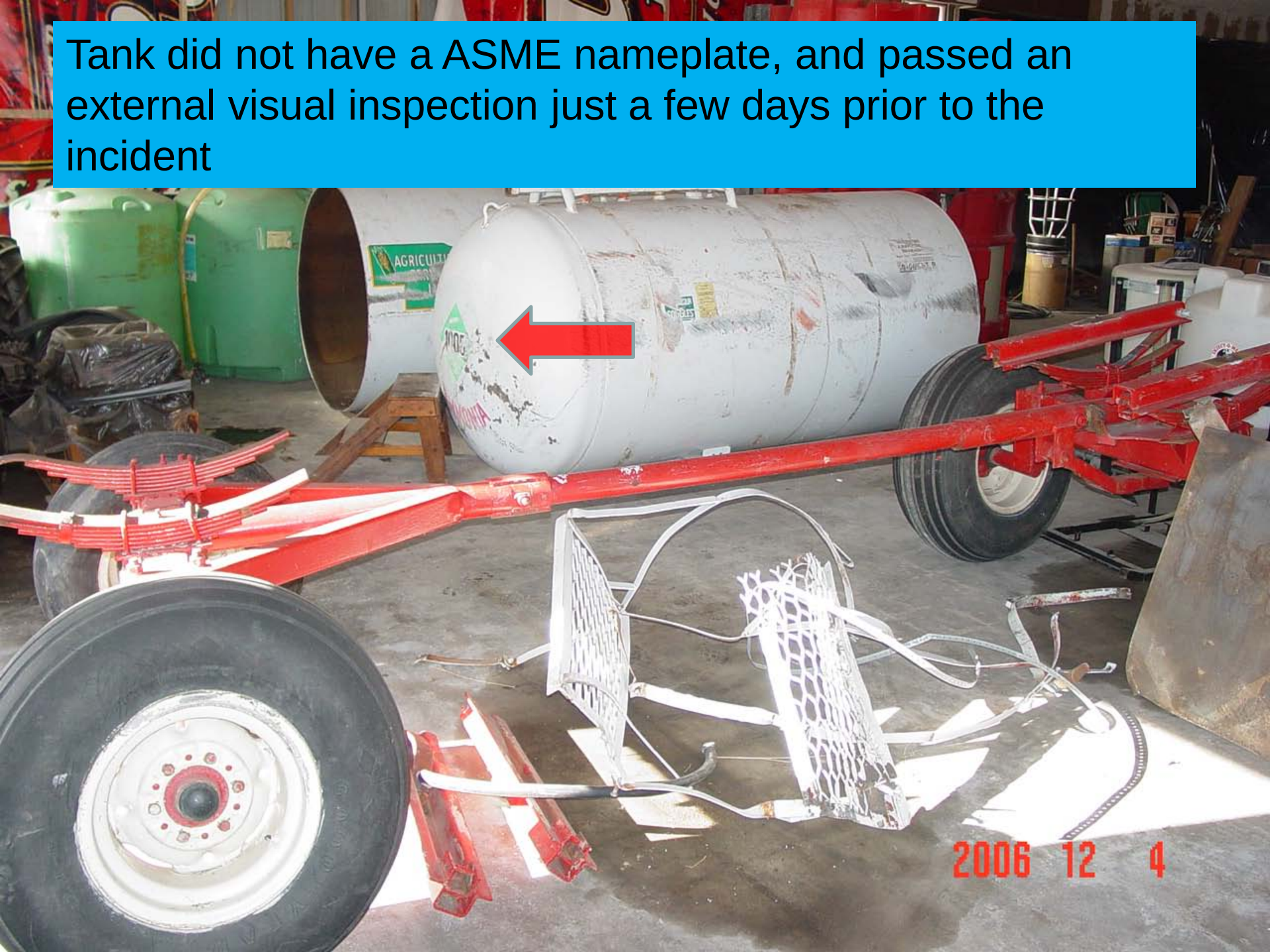
This picture shows that the sudden release of the gas blew a hole 36” deep.


The total length of the opening is approximately 4’6”
APR 17 2003


Offset
weld
A
B


The driver was going too fast, causing the trailer to fishtail. The trailer jackknifed breaking the tank loose from the farm wagon. Luckily, at the moment of tank rupture, the tank was not aligned with the back of the truck. The two halves went several thousand feet after separating.

Tank did not have a ASME nameplate, and passed an external visual inspection just a few days prior to the incident

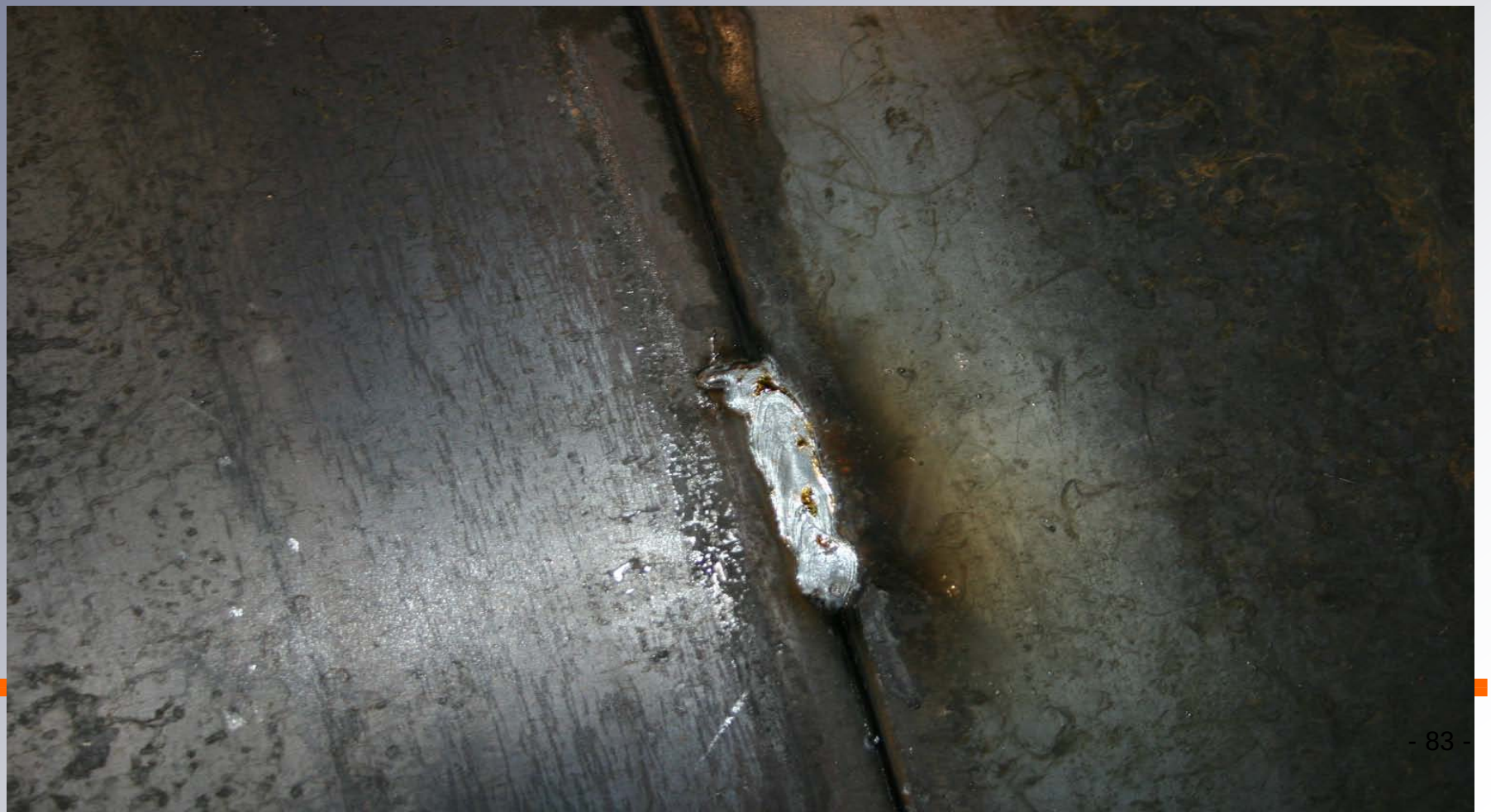


Tank failed hydrostatic testing in Canada


1203


1203

Nurse Tank Manufacturer with Problems



Weld Must Be “Ramped” Before Welded Over

Iowa State University at Ames

- Nurse Tank Peer Review Team has been formed
- University is destructive testing tanks
- Analyzing the metal coupons taken from donor tanks
- Checking for stress corrosion cracking
- Effects/benefits of heat treating heads and barrel
- Other effects on the tank metal

Notice of Proposed Rule Making

- NPRM (HM-245)
- Issued July 21, 2010
- Comments must have been returned by August 20, 2010
- The rule making will incorporate into the regulations the requirements currently found under the special permit
- The NPRM covers Moveable Fuel Storage Tenders, Liquid Soil Pesticides Fumigants, Non-DOT Specification Cargo Tanks used for roadway striping, LPG Storage Containers, and NURSE TANKS

U.S. Department
of Transportation

1200 New Jersey Avenue, SE
Washington, D.C. 20590

**Pipeline and Hazardous
Materials Safety Administration**

December 19, 2008

To all Anhydrous Ammonia/Nurse Tank Owners, Fillers, Transporters, Users, Repair Stations, Welders, Inspectors and Related Associations:

Based on eight (8) recent enforcement investigations, conducted by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Hazardous Materials Enforcement (OHME), this letter is intended to notify the industry of serious safety problems and non-compliance issues regarding the maintenance, filling, transport and use of nurse tanks in anhydrous ammonia service. PHMSA is greatly concerned with the lack of compliance and understanding of the minimum safety requirements for nurse tanks based on its investigations. PHMSA recognizes the breadth of the nurse tank industry. In order to magnify its safety and compliance efforts, PHMSA feels this letter will help increase awareness and provide a means of contact for questions about the prescribed safety requirements.

In all of the investigations, PHMSA Hazmat Investigators noted a similar pattern of non-compliance and safety problems. Below is a list of the areas of non-compliance and safety problems.

A nurse tank, by US DOT regulatory definition, is a cargo tank considered an implement of husbandry for the transportation of bulk anhydrous ammonia.

Under an exception in 49 CFR § 173.315(m) in the Hazardous Materials Regulations (HMR), the transportation of anhydrous ammonia in a "nurse tank" is only authorized if the tank is operated by a private carrier and used exclusively for agricultural purposes. This section also excepts a "nurse tank" from meeting the specification requirements for packaging in the (HMR). However, a nurse tank must meet the general requirements of § 173.24 and the specific criteria outlined in § 173.315(m) (below).

§ 173.315(m) Requirements

The tank must: (1) Have a minimum design pressure of 250 psig and meets the requirements of the edition of Section VIII of the ASME Code in effect at the time it was manufactured and marked.

(2) Be equipped with safety relief valves meeting the requirements of CGA pamphlet S1.2.

(3) Be painted white or aluminum.

§173.5 Agricultural Operations

- (a) Other than Class 2 materials transported over local roads between the fields of the same farm is excepted from the subchapter
- Class 2 is excepted from emergency response information and HM training; when
- It's by an intrastate farmer; and
- The movement conforms to the state requirements and was authorized by the state before October 1, 1998

§173.5 Agricultural Operations…cont'd

- (b) transportation of product from field to field within 150 miles of the farm is excepted from emergency response information, training, and specification packaging, when;
- (1) transported by an intrastate farmer; and
- (2) the total amount of product being transported in a single vehicle does not exceed;
- (i) 16,094 lbs. of ammonium nitrate fertilizer classed as a Division 5.1, PG III in a bulk packaging; or
- (ii) 502 gallons of liquids or gases or 5,070 lbs of solids for any other product

§173.5 Agricultural Operations...cont'd

- (3) the transportation of the product and packaging conforms with the requirements of the state in which it is being transported and was authorized by the state no later than October 1, 1998; and
- Each person having any responsibility for transporting the agricultural product or preparing the agricultural product for shipment has been instructed in the applicable requirements of this subchapter.

§173.6 Materials of Trade

- There are exceptions for class 3, 2.1, 2.2, 4.1, 4.3, 5.1, 5.2, 6.1, 6.2, 8, 9, and ORM-D in the regulations
- These exceptions are designed for products that are transported in commerce, that is transported in direct support of a principle business
- The exception generally provides relief from packaging, hazard communications and HM training as long as the driver is informed of the presence of the hazardous materials and is informed of the requirements of this section

Grain Fumigant

Table I Material requires placarding for any amount, shipping papers, marking, labeling, and packaging

Violation Percentages to Date

- Nurse tanks being operated without nameplates are running about 35% – 45 %
- Number of nurse tanks being operated in violation of the HMR are over 95%

Pipeline and Hazardous Materials Safety Administration
Office of Hazardous Materials Enforcement Central Region

Additional Information

Is Available

By Contacting

Terry Pollard

or Ted Turner at the Central Region Office

(847) 294-8580