

EPA Region 2 RCRA Air Emissions Inspector Training

**290 Broadway
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RCRA Organic Air Emissions



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RCRA Organic Air Emissions



- **Subpart AA-Process Vents on Separation Processes at TSDFs and LQGs**
- **Subpart BB-Equipment Leaks at TSDFs and LQGs**

RCRA Organic Air Emissions (cont'd)



- **Subpart CC-Storage of Organic Hazardous Waste in Tanks and Containers at TSDFs and LQGs**

Why be concerned about Organic Air Emissions



- **Major Concerns**
 - **Ozone**
 - **Air Toxics**

OZONE



- **Two types**
- **Stratospheric Ozone (Good)**
- **Tropospheric Ozone (Bad)**

OZONE (CONT'D)

- **Stratospheric ozone provides protection from the sun's rays**
- **Tropospheric Ozone is formed by a combination of NO_x, Emissions, Organic compounds (Air Toxics) and sun'**

Health effects of Ozone- Acute

- **Inflammation of the lungs**
- **Impaired breathing**
- **Coughing**
- **Chest pain**
- **Nausea**
- **Throat irritation**



Health effects of Ozone- Chronic

- **Increased susceptibility to respiratory infection**
- **Permanent damage to lung tissues and breathing capacity**



Welfare effects of Ozone



- **Material damage due to oxidation**
- **Reduction in crop yields**
- **Lower forest growth and premature leaf drop**
- **Two to three billion dollars annual damage to commercial crops and forest**

Air Toxics-What are they



- **Air pollutants that cause cancer or other human health effects**
- **Clean Air Act identifies 189 compounds**
- **Thousands of point and area sources**

Air toxics-Health Effects



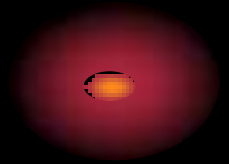
- **Neurological**
- **Behavioral**
- **Reproductive**
- **Cancer**

Organic Air Emissions-

Other concerns



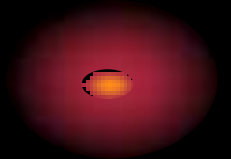
- **Global climate change**
- **Acid Rain**



Federal laws that address the problem



- **RCRA/HSWA**
- **Clean Air Act (NESHAPS)**
- **CERCLA/SARA**



RCRA

- **Section 3004 (n)**
- **Corrective action**
- **Land disposal restrictions**



Subpart AA

- **Promulgated June 21, 1990**
- **Is applicable at Treatment, Storage and Disposal facilities (TSDFs) and**
- **Large Quantity Generators (LQGs)**



Subpart AA (continued)



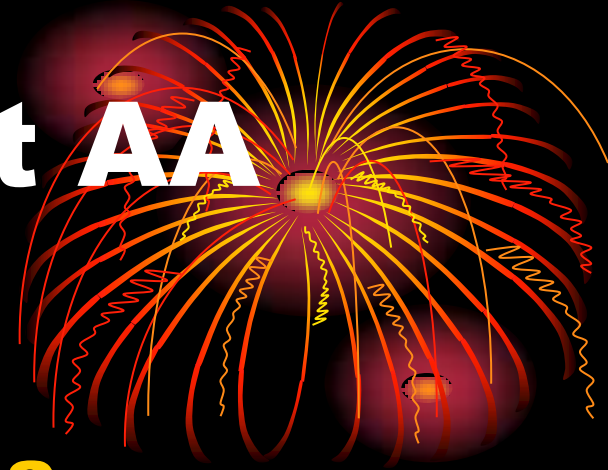
- **Requires control devices to reduce organic emissions either:**
- **Below emission limits (3 lb/hr and 3.1 tons/yr) or**
- **By at least 95 % by weight**

How do Subpart AA work?

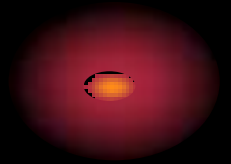


- **Identify the affected process vents**
- **Determine emission rates**
- **Sum individual emission rates**

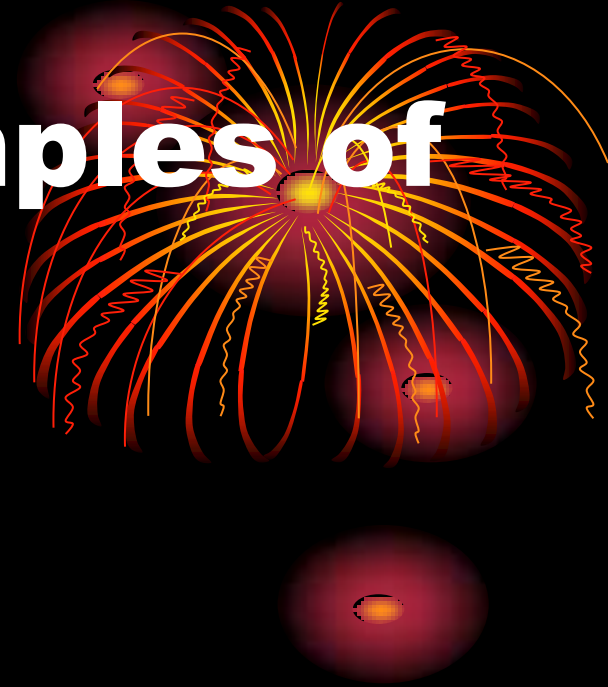
How Does Subpart AA work? (cont'd)



- **Compare emission rates**
- **Reduce emission rates below emission rates or by 95 %**



Subpart AA- Examples of Control Devices



- **Flares**
- **Carbon Adsorbers**
- **Condensers**
- **Thermal Incinerators**

Examples of Control Devices (cont'd)

- **Catalytic Incinerators**
- **Boilers and Process Heaters**



Subpart BB-Equipment Leaks

- **Promulgated June 21, 1990**
- **Applies to TSDFs and LQGs**
- **Applies to equipment containing/contacting hazardous waste with 10 % or more organics**



Subpart BB-Equipment Leaks (cont'd)



- **Control requirements vary by equipment type: Work practice, emission limitation, equipment specification**
- **Compliance is demonstrated through maintenance of records**

Subpart BB-300 hours exemption



- **If a facility uses Subpart BB equipment for < 300 hours then they can claim an exemption**
- **Before the facility can claim the exemption, a list of the equipment and criteria used for the exemption must be in the operating records**

Equipment Covered by Subpart BB



- **Pumps**
- **Valves**
- **Compressors**
- **Sampling connections**
- **Open ended valves or lines**
- **Pressure relief devices**
- **Flange and other connections**

Subpart BB-Work Practice requirements



- **Work practices are based on a Leak Detection and Repair (LDAR) Program**
- **LDAR varies by source type, but includes**
 - Leak detection monitoring (Method 21)**
 - Periodic inspections-e.g.,visual,²⁶**

Subpart BB-Light Liquid Definition

- **For a liquid to be in light liquid service, the vapor pressure of one or more organic constituents in the material must be greater than 0.3 kilopascal at 20 degrees Centigrade and the total concentration of pure organic constituents having a vapor pressure greater than 0.3**

Subpart BB-Heavy Liquid Definition



- **A heavy liquid is defined as any liquid that is not a light liquid**

Subpart BB-Valves in light liquid service



- **Should be monitored on a monthly basis, if no leaks found for two successive months, may be monitored on a quarterly basis**
- **If quarterly monitoring is done, should be monitored in the first month of the calendar quarter**

Valves in light liquid service

- **Facilities have the option of doing alternative monitoring**
- **There are two alternative methods**



Valves in light liquid service-Alternative methods

- **40 CFR Part 264/265.1061**
- **40 CFR Part 264/265.1062**

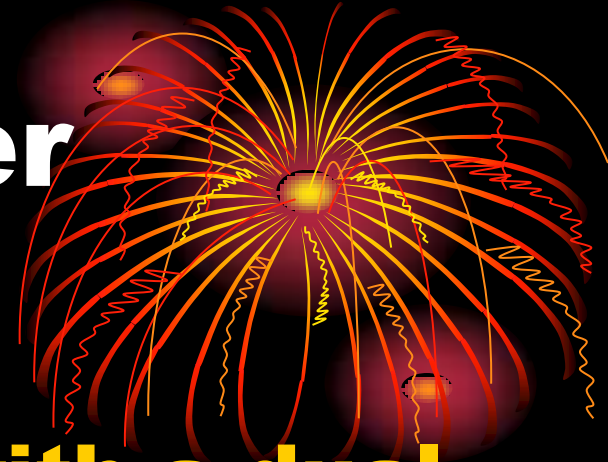


Pumps in light liquid service



- **Pumps should be monitored on a monthly basis and inspected on a weekly basis**
- **Pumps with barrier fluids have other requirements**

Pumps with barrier fluids



- **Each pump equipped with a dual mechanical seal that includes a barrier fluid is exempt from monitoring requirements provided they meet the following requirements**

Barrier fluid pump requirements



- **Each dual mechanical seal system must be:**
- **Operated with barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure or**
- **Equipped with a barrier fluid degassing reservoir that is connected to a closed vent system to a control device or**

Barrier fluid pumps requirements (cont'd)

- **Equipped with a system that purges the barrier fluid into a hazardous waste with NDE to the atmosphere**

Barrier fluid pumps requirements (cont'd)

- **The barrier fluid must not be a hazardous waste with organic concentrations 10 percent or greater**
- **Each barrier fluid system must be equipped with a sensor that will detect failure of the seal system, the barrier fluid system or both**

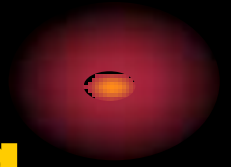
Barrier Fluid System (cont'd)



- **Each pump must be checked by visual inspection each calendar week for indications of liquids dripping from the pump seals**
- **Each sensor must be checked daily or be equipped by an audible alarm that must be checked monthly to ensure it is working properly**

Barrier Fluids Pump (cont'd)

- **The owner/operator must determine, based on design considerations and operating experience, a criterion that indicates pump failure**



Barrier fluid pump requirements



- **If there are indications of liquids dripping from the pump seal or the sensor indicates failure of the seal system, the barrier fluid system or both, based on the criterion determined, a leak is detected**

Barrier Fluids Pumps

- **Leaks should be repaired in 15 days**
- **First attempt must be done in 5 days**

Pumps in light liquid service (cont'd)

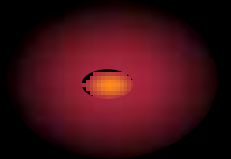


- **Pump designated as Non Detectable Emissions may be monitored on an annual basis if they meet certain conditions**

Pumps and valves in heavy liquid service



- **If a leak is observed (visual, olfactory, audible or any other method), monitoring shall be made in 5 days**



Pressure relief valves, flanges, connectors in heavy/light service

- **If a leak is observed (visual, olfactory, audible or any other method), monitoring shall be done in 5 days.**



Subpart BB-Leaks and Repairs



- **In Subpart BB, a leak is defined to be above 10,000 p.p.m.**
- **When a leak is discovered, facility has to tag leak**

Subpart BB-LDAR (cont'd)



- **A first attempt to repair the leak should be made in 5 days and repairs completed no later than 15 days**
- **If the equipment is hard to reach or it will disrupt operations, facility can delay fixing leak**

Monitoring required by Subpart BB



- **Monitoring shall be done according to Method 21 (40 CFR Part 60)**
- **Instruments used for monitoring include OVA 108 and Foxboro TVA 1000 A and 1000 B.**

Subpart BB-Calibration

- **A calibration precision test shall be done before the instrument is placed in service and every 3 months thereafter or whenever the instrument is used if more than 3 months has elapsed**

Subpart BB Calibration (cont'd)



- **The instrument shall be calibrated with a zero gas (<10 p.p.m. HC) and with a 10,000 p.p.m. methane or hexane standard**
- **For NDE, a 500 p.p.m. standard is used**

Subpart BB Calibration (cont'd)

- **Calibration gases have specific shelf life (3 years)**
- **Calibration must be within 2.5 % accuracy**
- **If the adjustment cannot be made, then the instrument**

Subpart BB- common violations

- **Failure to mark equipment subject to Subpart BB**
- **Failure to list equipment subject to Subpart BB**



Subpart BB- common violations (cont'd)

- **Failure to monitor valves subject to Subpart BB**
- **Failure to monitor pumps subject to Subpart BB**



Subpart BB- common violations (cont'd)

- **Failure to test/inspect pumps**
- **Failure to test valves**
- **Failure to perform performance test**



Subpart BB- common violations (cont'd)



- **Failure to calibrate with a gas of specified shelf life**
- **Failure to adjust the instrument within 2.5 % of the calibration gas value**

Subpart CC



- **Became effective in 1996**
- **Applicable to TSDFs and LQGs that manage Hazardous waste of Volatile Organic Concentration of 500 ppmw in Tanks and containers**

Subpart CC-Tank Storage

- **Two levels can be used to manage waste**
- **Tank Level One**
- **Tank Level Two**



Subpart CC-Tank Level One



- **Requires a fixed roof tank which uses a maximum organic vapor pressure to comply with Subpart CC**
- **No heating to temperature greater than which vapor pressure is determined**
- **No waste stabilization in tank.**

Subpart CC Tank Level

One-Vapor pressure limits

- **40,000 gallons and above, maximum vapor pressure of < 0.75 psi**
- **20,000 gallons and above but less than 40,000 gallons,.mvp < 4.5 psi**
- **Less than 20,000 gallons,.mvp < 11.1 psi**



Subpart CC-Tank Level Two



- **5 options**
- **Internal Floating Roof**
- **External Floating Roof**
- **Fixed Roof Vented to a control device**

Subpart CC Tank Level 2-Options (Cont'd)



- **Pressure Tank**
- **A tank located inside an enclosure vented through a closed vent system to an enclosed combustion device**

Subpart CC-Tank storage



- **Most facilities comply with Tank Level 1 which is the easiest to follow**
- **The other option that will be seen a lot is level Two, Option 3**

Subpart CC-Container Storage

- **Most facilities store their waste in DOT approved containers**
- **RCRA regulations already cover such storage and as a result most facilities will be in compliance with the container requirements of the Subpart CC regulations**



Subpart CC-Container storage (cont'd)



- **Three levels**
- **Level One**
- **Level Two**
- **Level Three**

Subpart CC Container Storage-Level One



- **3 options**
- **Option 1-Meet DOT standards**
- **Option 2-Use a cover on the container and ensure that there are no visible gaps in the interior or holes in the cover**
- **Option 3-Use a vapor suppressing barrier on or above the hazardous waste in the container**

Subpart CC Container Storage-Level Two



- **3 options**
- **Option One-The container must meet DOT specifications**
- **Option Two-Operates with no detectable emissions under Method 21**
- **Demonstrated to be vapor tight within the last twelve months using Method 27**

Subpart CC Container Storage-Level Three



- **2 options**
- **Place open container inside an enclosure vented directly to a control device**
- **Vent container opening directly to a control device**

Subpart CC Container Level Three requirements

- **Must be used for waste stabilization**
- **Closed vent system and control device designed and operated to meet Subpart CC requirements**



Subpart CC-Common Violations

- **Failure to determine maximum organic vapor pressure**
- **Failure to secure closure devices on top of a tank**



Subpart CC-Common Violations (cont'd)

- **Failure to perform initial and annual inspection of tanks**
- **Failure to show level two container is operating at NDE**



Industries targeted for inspection

- **Electronics-IBM, Kodak, AZEM**
- **Pharmaceuticals-Pfizer, Squibb, MOVA**
- **Fragrances-Givaudan, Firmenich, Elan**
- **Miscellaneous-GSF Energy (Landfill gas), Witco-Plastizer**



Some problems faced in case development

- **Subpart BB does not require facilities to keep records of calibrations and monitorings, only required to keep records of leaks**
- **Facilities change their story**
- **Need to send out an information request letter (EPA 3007)**

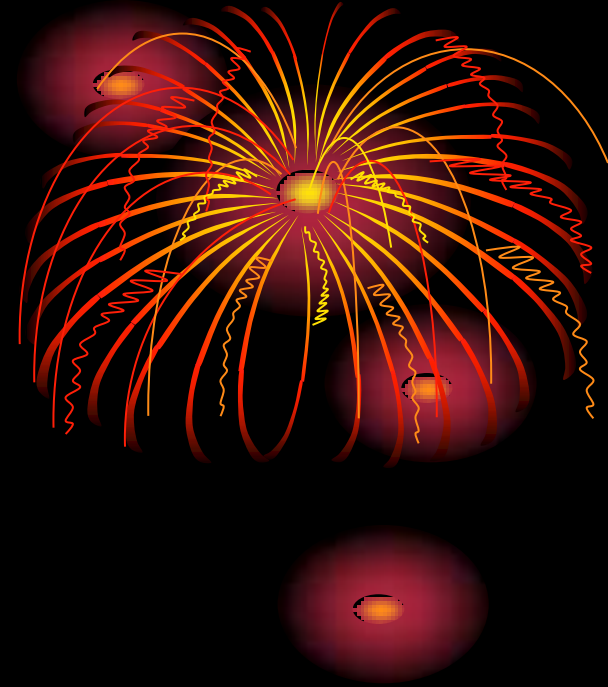
Problems faced in case development



- **Facility response will be inconsistent with what was told at time of inspection-keep good notes**
- **Facility will claim manufacturing process unit exemption**
- **Will present a lot of irrelevant**

Case Study 1

- **Landmark case**
- **TSD and LQG**
- **Facility was complying with Subpart BB and CC for a major portion of facility**



Case Study 1 (cont'd)

- **Did an inspection in June 1999**
- **Facility claimed manufacturing exemption for equipment transporting hazardous waste, recyclable material and reusable material**

Case Study 1 (cont'd)



- **Region 2's position is that if equipment is used to transport hazardous waste for more than 300 hours, Subpart BB applies**
- **EPA Headquarters longstanding position is that if process equipment is used to transport hazardous waste, the equipment is regulated under Subpart J**

Case Study 1 (cont'd)



- **Facility's main concern-Subpart J requirements**
- **Equipment not monitored-171 valves and 146 pumps in 73 areas**

Case Study 1-Violations



- **Violations cited: Failure to monitor valves and pumps**
- **Failure to inspect pumps**
- **Failure to determine that 26 containers were operating at NDE**

Case Study 1-Penalty



- **Initial penalty was \$303,000**
 - **Adjusted penalty was \$ 202,000**
 - **Facility settled for \$175,000**
- 

Case Study 2



- **Pharmaceutical Company**
- **Does contract manufacturing**
- **Got a contract to manufacture allegra**

Case Study 2 (cont'd)



- **Put two storage tank in service to store hazardous waste**
- **Started to store hw in the tanks without complying with Subparts BB, CC and J in December, 2004**

Case Study 2 (cont'd)

- **Inspection conducted in 2006**
- **Facility used methylene chloride to coat tablets**

Case study 2 (cont'd)



- **Methylene chloride vapors vented using blowers and a duct system to a carbon adsorption system**
- **Methylene chloride and water condense and are separated**

Case Study 2 (cont'd)



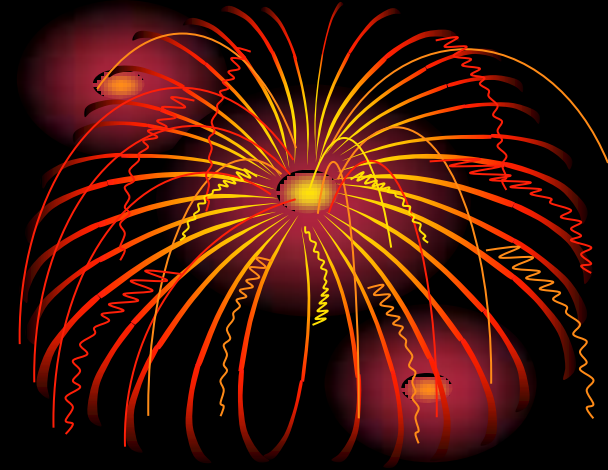
- **Spent Methylene chloride and aqueous waste were pumped to separate tanks**
- **Inspector observed 13 valves and 3 pumps attached to the tank system**
- **Facility did not comply with Subparts BB,CC and J**

Case Study 2- Enforcement)

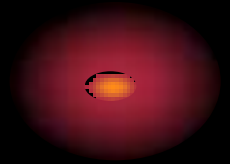


- **NOV/3007 letter sent out in July 2006**
- **Identified violations**
- **Asked facility for information to build case**

Case Study 2



- **Facility sent response on September 2006**
- **Facility identified Subpart BB equipment**
- **Identified 3 pumps and 37 valves subject to BB requirements**



Case Study 2



- **Started to do daily inspection for RCRA from March 2005**
- **Asked facility if they did an initial tank inspection could be used as initial Subpart CC inspection (certified tank assessment)**
- **Facility responded that it did not have a certified tank assessment**

Case Study 2

- **Facility requested a meeting with EPA prior to issuance of complaint and opted for an expedited settlement**



Case Study 2-Violations



■ -Failure to monitor pumps

■ -Failure to monitor valves

■ -Failure to inspect pumps

■

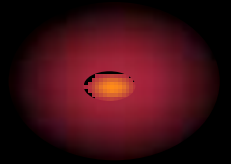
Case Study 2-Violations (cont'd)



- **Failure to determine maximum organic vapor pressure**
- **Failure to perform daily inspection from December 2004 to March 2005**

Case Study 2-Violations (cont'd)

- **Failure to perform tank assessment prior to storing hazardous waste in tank**



Case Study 2-Settlement



- **If complaint was issued, penalty would have been in \$125,000-\$130,000 range**
- **EPA offered to settle for \$80,000**
- **Facility accepted EPA's offer**

INSPECTION PHOTOGRAPHS



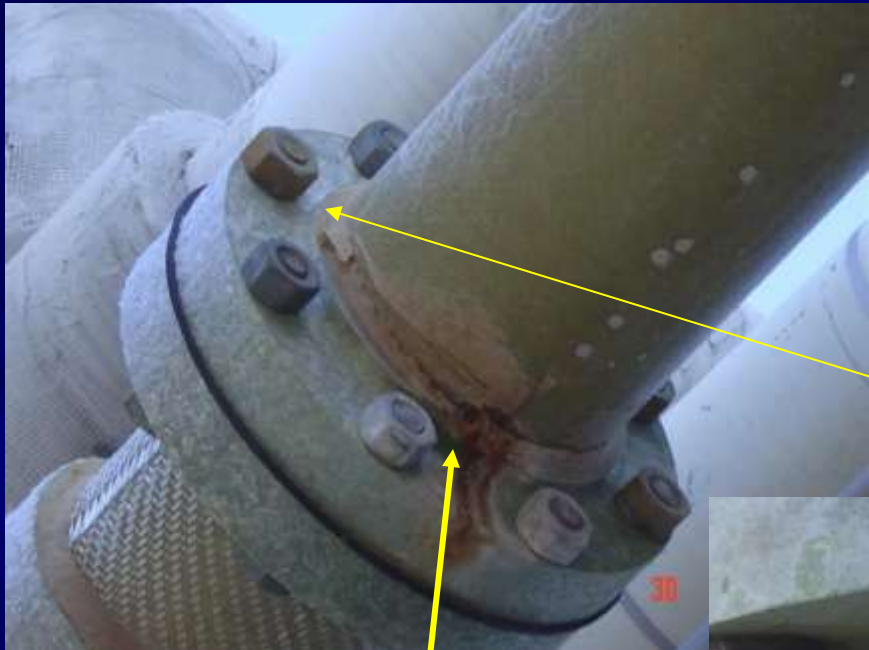
CREDITS:

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NJDEP Northern Region RCRA Enforcement



The image shows a complex industrial piping system. A horizontal pipe runs across the middle, with a vertical pipe intersecting it from above. The vertical pipe is pushing down on the horizontal pipe, causing a visible separation at a flange joint. The pipes are made of metal and show signs of wear and rust. A yellow text overlay with arrows points to the affected area.

**Vertical Line is Pushing E Sump Discharge
Down Causing Separation at Flange Joint**



Flanges Missing Bolts & Washers

**Cracked Flanges on E
Sump Discharge Line
Due To Insufficient
Supports - Leaking**



Cracked Flange Above Pump



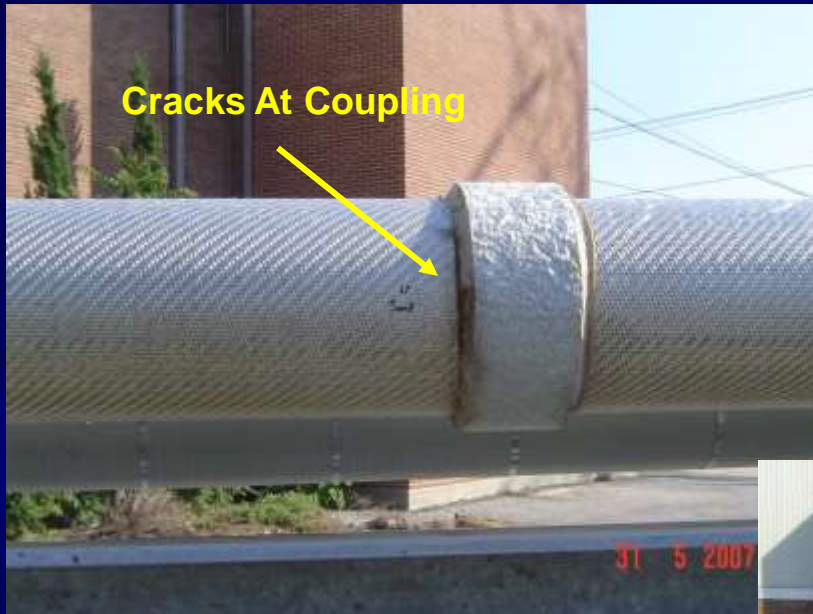
Leaks At Adhesive Glue Joint



Missing Bolt









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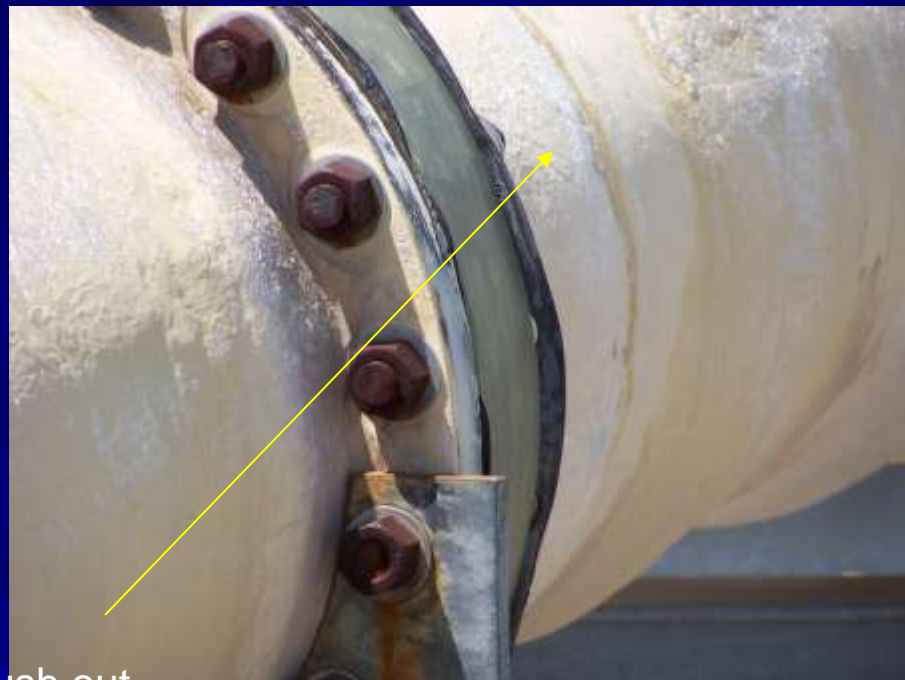
Cracked
flange

1 6 2007



Piece of wood driven
into hole in valve

1 6 2007



Gasket push out







































