

HC 10/2/87
OCS.fj m 2-9/87

VINYL CHLORIDE

RAILROAD TANK CAR

LOADING OPERATION

AND

UNLOADING OPERATION

1093J/KP
9/28/87

VMD 720903

HOW MANY LIQUID HOSES DO YOU ATTACH? SIZE?

LOADING:

ONE - 7	1-1/2" - 1
TWO - 4	2" - 6
	3" - 4

HOW MANY VAPOR HOSES DO YOU ATTACH? SIZE?

LOADING:

ONE - 10	1" - 2
TWO - 1	1-1/2" - 2
	2" - 5
	3" - 1

HOW MANY LIQUID HOSES DO YOU ATTACHE? SIZE?

UNLOADING:

ONE - 10	2" - 11
TWO - 11	3" - 9
	4" - 1

HOW MANY VAPOR HOSES DO YOU ATTACH? SIZE?

UNLOADING:

ONE - 15	1" - 2
TWO - 1	1-1/2" - 2
	2" - 14
	3" - 1

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VMD 720905

DO YOU HAVE AN EXCESS FLOW VALVE IN THE PIPING? (NOT THE
EXCESS FLOW VALVE IN THE RAILROAD CAR.)

LOADING:

YES - 4

NO - 8

UNLOADING:

YES - 0

NO - 21

IF YES, PLEASE DESCRIBE THE TYPE OF VALVE AND WHERE IT IS
LOCATED.

LOADING:

- TUFLIN VALVE - 10M FROM OFF-LOADING STATION
- MASONEILAN VALVE - UPSTREAM OF HOSE FLANGE
- SPRING-CHARGED EXCESS FLOW VALVE - FIXED PIPING
- OVERSPEED COUNTER SHUTOFF VALVE - PIPING

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VMD 720906

DO YOU HAVE A CHECK VALVE IN THE PIPING OF EACH UNLOADING HOSE?

UNLOADING:

YES - 9

NO - 12

IF YES, PLEASE DESCRIBE THE TYPE OF VALVE AND WHERE IT IS LOCATED.

- CHECK VALVE AT EACH UNLOADING TOWER
- SWING CHECK VALVE
- FLAPPER CHECK VALVE IN FIXED PIPING
- CHECK VALVE AT EACH UNLOADING STATION
- CHECK VALVE AT PUMP DISCHARGE
- METAL FLAP VALVE AT PUMP DISCHARGE
- BALL VALVE 300MM FROM CONNECTING FLANGE
- CHECK VALVE IN PIPING
- TWO-BEAT VALVE NEXT TO BLOCK VALVE

1093J/KP

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VMD 720907

DO YOU RELY ON THE RAILROAD CAR EXCESS FLOW VALVE?

LOADING:

YES - 7

NO - 3

COMMENTS:

- OVERSPEED COUNTER PROVIDES SAFETY
- RAILROAD EXCESS FLOW IS DESIGNED FOR DERAILMENT IF VALVES ARE WIPED OFF OR IN CASE AN UNLOADING LINE IS COMPLETELY RUPTURED. THEY WILL NOT SEAT WITH A SMALL LEAK.

UNLOADING:

YES - 13

NO - 6

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VMD 720908

HOW DO YOU MEASURE THE VCM LEVEL IN THE RAILROAD TANK CAR?
PLEASE DESCRIBE.

LOADING:

- VOLUMETRICAL MEASUREMENT
- FIXED NEEDLE VALVE AT MAXIMUM ALLOWABLE LOAD
- MIDLAND MAGNETIC GAUGE
- MIDLAND MAGNETIC GAUGE
- MIDLAND MAGNETIC GAUGE - WEIGHED
- LOAD ON SCALES
- LOAD ON SCALES
- LOAD ON SCALES
- TEMPERATURE AND OUTAGE TABLE

UNLOADING:

- BAYONET AND ROTOGAUGE
- PRESSURE DROP AND SIGHT GLASS
- LINE TEMPERATURE AND SIGHT GLASS
- SLIP TUBE
- WEIGH BEFORE AND AFTER UNLOADING
- BAYONET FLOAT GAUGE AND ROTARY LEVEL INDICATOR
- BY WEIGHT
- BY WEIGHT
- ROTARY GAUGE
- MIDLAND MAGNETIC GAUGE
- MIDLAND MAGNETIC GAUGE
- MIDLAND MAGNETIC GAUGE
- MIDLAND MAGNETIC GAUGE - VAPOR
- PRESSURE DROP
- RAILROAD CAR SPRINGS AND SIGHT GLASS
- OUTAGE GAUGE

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VMD 720909

WHAT TYPE OF SAFETY PROTECTION IS PROVIDED IN YOUR RAILROAD
TANK CAR LOADING/UNLOADING OPERATION? PLEASE DESCRIBE.

LOADING:

- BONDING AND GROUNDING ON SHUTOFF VALVES
AUTOMATIC
- SHUTDOWNS ON HIGH PRESSURE AND OVERWEIGHT
- FIRE WATER MONITORS AND AREA MONITORING
- FIRE WATER MONITORS
- FIRE WATER MONITORS
- AREA MONITORING
- LOADING AREA VENT/LIQUID ABV'S, REMOTE PUMPS
SHUTOFFS, GROUND INDICATOR, FIRE WATER MONITORS
- LEL DETECTORS, HIGH PRESSURE, HIGH LEVEL AND VALVE
POSITIONS ARE INTERLOCKED
- EMERGENCY SHUTDOWN VALVES
- OVERFILL PROTECTION BY VOLUME AND WEIGHT
- EMERGENCY AUTOMATIC SHUTDOWN VALVES, HIGH PRESSURE,
OVERSPEED ON VCM COUNTER
- VAPOR DETECTORS WITH AUTOMATIC SHUTDOWN, DELUGE FIRE
SYSTEM

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VMD 720910

DO YOU HAVE A GC MONITORING SYSTEM IN THE LOADING/UNLOADING
AREA? YES. NO. OTHER.

LOADING:

YES - 6
NO - 2
OTHER - 2

UNLOADING:

YES - 13
NO - 3
OTHER - 6

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VMD 720911

DO YOU INSTALL A REMOTE OPERATED SHUTOFF VALVE AT THE TANK CAR CONNECTION? IF YES, WHAT ACTIVATES THIS VALVE?

LOADING:

YES - 3

NO - 7

COMMENTS:

- SCALE WEIGHT OR MANUAL ACTUATION
- MANUAL REMOTE SHUTOFF VALVES
- EMERGENCY STOP, FILLING COUNTER AND OVERFILLING ALARM

UNLOADING:

YES - 7

NO - 13

COMMENT:

- AIR FAILURE, REMOTE SWITCH, LEL
- RAILROAD CAR MOVEMENT, REMOTE AND LOCAL SWITCH
- GAS MONITOR OR MANUAL BUTTON
- FLOW METER, MANUAL OR LOSS OF GROUND
- LOSS OF GROUND AND LOSS OF AIR
- RAILROAD CAR WEIGHT OR PUMP STOPPING
- LOSS OF AIR AND REMOTE SWITCH

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VMD 720912

WHAT TYPE OF HOSE DO YO USE IN THIS SERVICE? PLEASE DESCRIBE.

LOADING:

- CHEMIFLEX (LAYERED POLYPROPYLENE) AND BRAIDED SS TEFLON LINED
- CHEMIFLEX 0951PP (POLYPROPYLENE REINFORCED WITH GALVANIZED WIRE)
- CHEMIFLEX (POLYPROPYLENE WITH CARBON STEEL WIRE)
- JOINT ARM PIPES AND FITTING
- METAL HOSE
- ANACONDA METAL HOSE #C.T.21-1
- STAINLESS STEEL, TEFLON LINED
- STAINLESS STEEL FLEX
- STAINLESS STEEL, TFE LINED
- CONTINENTAL EMSCO SWIVEL JOINTS
- GATES 45 HW, LIQUID AND GASEOUS HOSES

UNLOADING:

- STAINLESS STEEL 304 (FLEXONVE STYLE 461)
- ARMoured STAINLESS STEEL
- STAINLESS STEEL FLEX HOSE
- STAINLESS STEEL FLEXCARE
- STAINLESS STEEL FLEXIBLE HOSE WITH RUBBER COVER
- STAINLESS STEEL BRAIDED
- STAINLESS STEEL FLEX HOSE
- STAINLESS STEEL BRAIDED HOSE
- STAINLESS STEEL FLEX HOSE
- STAINLESS STEEL FLEX HOSE
- DOUBLE BRAIDED STAINLESS STEEL

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- BRAIDED STAINLESS STEEL FLEX HOSE
- PIPE WITH FLEXIBLE UNIT
- LOADING ARMS
- RIGID ARTICULATED PIPE (PEROLO TYPE)
- UNLOADING ARM WITH SWIVEL JOINTS
- C.S. PIPE WITH SWIVEL
- HARD PIPING WITH SWIVEL
- RUBBER TUBE WITH SYNTHETIC WOVEN REINFORCEMENT AND SYNTHETIC RUBBER COVER
- CHEMICAL HOSE - E.P. SHIELD EPTON INDUSTRIES

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VMD 720914

DO YOU HAVE AN INSPECTION OR TESTING PROGRAM FOR THESE HOSES?
PLEASE DESCRIBE.

LOADING:

- NO
- NO COMMENT
- MONTHLY VISUAL INSPECTION
- VISUAL INSPECTION
- EXTERNAL INSPECTION DAILY WHEN HOOKED UP
- ANNUAL EXTERNAL INSPECTION
- WATER PRESSURE TEST ANNUALLY, OVA SEMIANNUAL
- TWO YEAR BY ASSOC. FOR TECHNICAL INSPECTION
- ANNUAL HYDRO TEST AND VISUAL BEFORE EACH USE
- ANNUAL ULTRASOUND THICKNESS CHECK

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VMD 720915

DO YOU HAVE AN INSPECTION OR TESTING PROGRAM FOR THESE HOSES?
PLEASE DESCRIBE.

UNLOADING: .

- SOAP TESTED WITH EACH USE
- VISUAL, OVA AND PRESSURE TESTED ANNUALLY
- ANNUAL HYDRO TEST AND N₂ BEFORE EACH USE
- VISUAL CHECK DAILY
- VISUAL CHECK DAILY
- NONE - REPLACE EVERY THREE MONTHS
- NO
- ANNUAL HYDRO TESTED AND VISUAL BEFORE EACH USE
- PNEUMATIC TEST EVERY THREE MONTHS AND VISUAL BEFORE EACH OPERATION
- VISUAL WITH EACH HOOK-UP
- DAILY VISUAL BY UNLOADER
- EVERY TWO YEARS
- HYDROSTATIC TEST EVERY THREE MONTHS, VISUAL EVERY WEEK AND REPLACE EVERY SIX MONTHS.
- NO FORMAL PROGRAM - VISUAL BEFORE UNLOADING
- ONCE PER YEAR BY CONTRACTOR
- VISUAL INSPECTION
- SEMI-ANNUAL VISUAL AND PRESSURE TEST
- ARMS INSPECTED ANNUALLY
- MONTHLY INSPECTION - HYDROSTATICALLY PRESSURE TESTED ANNUAL, BEFORE INSTALLATION AND AFTER MODIFICATION OR REPAIR

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VMD 720916

WHAT TYPE OF DISCONNECT DO YOU USE IN THIS SERVICE? PLEASE DESCRIBE.

LOADING:

- FLANGED
- FLANGED
- FLANGED
- HAMMER UNIONS
- SCREWED - ACME THREAD
- HAMMER UNION - WECO
- HAMMER UNION WITH VITON "O"-RING
- HAMMER UNION WITH VITON "O"-RING
- EVER-TITE QUICK CONNECTORS
- KAMVALOCK - EVALUATING HILLTAP

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4

WHAT TYPE OF DISCONNECT DO YOU USE IN THIS SERVICE? PLEASE DESCRIBE.

UNLOADING:

- FLANGED
- FLANGED
- FLANGED
- "HUOCK ON" COUPLING
- THREADED PIPE WITH UNION
- HAMMERLOCK WITH "O"-RING
- WECO UNION
- HAMMER UNION
- HAMMERLOCK WECO WITH VITON "O"-RING
- WECO SCREWED FITTING
- REGO SCREW TYPE
- WECO UNION
- HAMMER UNION (BRASS TOOLS)
- OPG PROPANE FITTING
- EVER-TITE - KAMLOCK
- OPW KAMLOCK
- KAMLOCK OR EVER-TITE
- BOSSLOCK TYPE FITTING
- DRY BREAK - KANON

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VMD 720918

DO YOU REQUIRE CONSTANT ATTENDANCE BY AN OPERATOR DURING
LOADING OR UNLOADING?

LOADING:

YES - 8
NO - 0
OTHER - 2

COMMENTS:

- CHECK EVERY HALF HOUR
- FUTURE BY TV MONITOR
- HIGHLY VISIBLE FROM CONTROL ROOM

UNLOADING:

YES - 12
NO - 6
OTHER - 1

COMMENTS:

- OPERATOR IN GENERAL AREA
- INSTALLING CC TV

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VMD 720919

HOW DO YOU REMOVE THE VCM VAPORS IN THE HOSES FOR DISCONNECT?
PLEASE DESCRIBE.

LOADING:

- DEPRESSURIZATION TO DRUM WITH CHIMNEY TO ATMOSPHERE
- VACUUM COMPRESSOR
- BLOW INTO TANK CAR WITH N₂
- BLOW INTO TANK CAR WITH N₂
- N₂ PRESSURE AND DEPRESSURE
- PURGE WITH N₂ TO INCINERATOR
- SMALL SPOOL PURGED WITH N₂ TO FLARE
- RINSING WITH N₂
- N₂ PURGE TO GAS HOLDER AND INCINERATOR
- PURGE WITH N₂

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VMD 720920

HOW DO YOU REMOVE THE VCM VAPORS IN THE HOSES FOR DISCONNECT?
PLEASE DESCRIBE.

UNLOADING:

- COMPRESSORS USED TO BELOW 5 PSIG
- VACUUM - COMPRESSION SYSTEM
- VENTED TO ATMOSPHERE
- RECOVERED TO FLARE
- N₂ TO GAS HOLDER, CONNECTED TO RECOVERY UNIT
- VENT TO FLARE STACK
- DEGAS TO 12 PSIG WITH COMPRESSOR
- BY DRAINING IT, INERTED WITH N₂
- N₂ PURGE TO GAS HOLDER
- COMPRESSOR USED TO 10 PSIG - 4" SPOOL
- PULLED DOWN WITH RECOVERY SYSTEM
- DOUBLE BLOCK AND BLEED TO VENT SYSTEM
- PULL VACUUM ON HOSES
- RECOVERED TO A 30" VACUUM
- EVACUATED TO 15" VACUUM
- COLD ROOM RECOVERY SYSTEM
- RECOVERED WITH VACUUM SYSTEM
- EVACUATION
- PRESSURE REDUCED TO 5-10 PSIG
- TWO FOOT SPOOL VENTED

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VMD 720921

WHAT ARE YOUR REQUIREMENTS FOR CHOCKING AND SETTING THE BRAKES ON THE RAILROAD CAR? PLEASE DESCRIBE.

LOADING:

- SHOE PLACED ON RAIL
- CAR CHOCKED AND HAND BRAKE SET
- EACH CAR CHOCKED AND HAND BRAKE SET
- CHOCKED AND BRAKES SET
- BRAKES SET AND CHOCKS IN PLACE
- NO SPECIAL REQUIREMENTS
- BRAKES SET AUTOMATICALLY
- RAILROAD BLOCK IN FRONT AND BEHIND AND TWO WHEEL BLOCKERS INSTALLED
- BRAKES SET AND RAILROAD CAR IS CHOCKED
- BRAKES SET AND PAIR OF CHOCKS
- BRAKES SET, WHEELS CHOCKED, GROUND CONNECTED, CHECKLIST USED

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VMD 720922

WHAT ARE YOUR REQUIREMENTS FOR CHOCKING AND SETTING THE BRAKES ON THE RAILROAD CAR? PLEASE DESCRIBE.

UNLOADING:

- WHEELS CHOCKED ON BOTH SIDES AND HAND BRAKE SET
- DERAIL, ONE WHEEL DOUBLE CHOCKED AND HAND BRAKE SET
- WHEELS CHOCKED AND BRAKE SET ON EACH RAILROAD CAR
- HAND BRAKE SET AND ONE SET OF WHEEL CHOCKS USED
- DOUBLE CHOCK ONE WHEEL AND SET HAND BRAKE
- DOUBLE CHOCK WHEELS AND CONNECT GROUND CABLE
- SET HAND BRAKE, CHOCK WHEEL AND SET DERAIL
- HAND BRAKE SET AND TWO CHOCKS INSTALLED
- HAND BRAKE SET AND WHEELS CHOCKED
- "MAN WORKING" SIGN POSTED, BRAKE SET AND WHEELS CHOCKED
- HAND BRAKE SET AND LOCKED, WHEELS CHOCKED AND GROUND CONNECTED
- BRAKES SET AND WHEELS CHOCKED
- BRAKES NOT SET, WHEELS CHOCKED AND GROUND CONNECTED
- HAND BRAKES APPLIED
- SPECIAL WHEEL BLOCKERS
- BRAKES FREE AND SPECIAL CHOCKS FIXED ON RAIL
- BRAKES APPLIED
- BRAKES SET AND CHOCKS INSTALLED
- BRAKES SET AND CHOCKS INSTALLED

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VMD 720923

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HAVE YOU EVER EXPERIENCED AN UNCONTROLLED RELEASE IN THE LOADING/
UNLOADING OPERATION? PLEASE DESCRIBE THE INCIDENT, THE CAUSE AND THE
CORRECTIVE MEASURES TAKEN.

LOADING:

YES - 4
NO - 7

INCIDENTS:

- RUPTURE OF A HOSE DUE TO DISPLACEMENT OF RAILROAD CARS BEFORE DECONNECTION OF ONE HOSE. ACTION: FLANGES WITH MALE AND FEMALE PARTS AND APPLICATION OF NEW GRAPHITED GASKETS ON EACH FILLING OPERATION.
- A RAILCAR BEING LOADED ROLLED OFF THE SPOT AND SEPERATED A 2" FLEX HOSE. THE CAR WAS BEING LOADED. THE AUTO SHUT DOWN VALVE WAS CLOSED. THE CAR WAS BACKFLOWING OUT THE LOADING VALVE. THE EXCESS FLOW DID NOT SEAT. VALVE WAS MANUALLY CLOSED. INVESTIGATION REVEALED THERE WAS NO PROPER CHECKING PROCEDURE AT THAT TIME. CARS ARE NOW REQUIRED TO BE CHOCKED A AND B END AND HAVE HAND WHEEL BRAKE SET PRIOR TO LOADING.
- YES, ORIGINAL HOSES WERE 3" CARBON STEEL TUBE AND EXTERNAL BRAID. HOSE WAS APPROXIMATELY NINE MONTHS OLD. BRAID WAS CORRODED AT THE END FITTING AND SEPERATED. A RUPTURE OCCURRED. CAR XS FLOW VALVE SEATED AND LOADING VALVE ON ROCK WAS MANUALLY CLOSED. INSTALLED MANUAL REMOTE SHUTDOWN VALVES CHANGED TO STAINLESS BRAIDED HOSE AND NON-METALLIC HOSES PLUS FREQUENT HOSE INSPECTIONS.
- A HOSE FAILURE OCCURRED APPROXIMATELY FIVE YEARS AGO. AT COMPLETION OF LOADING THE MANUAL LIQUID VALVE AT THE T/C LOADING STATION #1 WAS CLOSED. THE LOADING OPERATOR STARTED WALKING TO THE NEXT T/C TO CHECK ITS PROGRESS. AFTER HEARING A NOISE HE TURNED TO SEE THAT THE HOSE AT #1 HAD COMPLETELY SEPERATED AT THE RING THAT COUPLES THE INDIVIDUAL HOSE COMPONENTS TO THE FLANGED SECTION. THE T/C EXCESS FLOW VALVE CHECKED SO THAT ONLY THE CONTENTS OF THE HOSE WERE SPILLED. THE CAUSE OF THE FAILURE WAS IMPROPER ASSEMBLY BY THE HOSE MANUFACTURER.

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VMD 720924