Vortex Ventures Inc. Dust Recovery Tank "DRT"

VORTEX VENTURES FLOW PROCESS FOR DUST RECOVERY TANK
& OPERATIONAL INSTRUCTIONS

1. A dense phase pneumatic conveying system is employed to transfer and store bulk barite and bulk cement when transferred from a Marine Supply vessel.

2. During the conveying process of material transfer, the expanding air generates dust that is exhausted through the “P” Tank vent lines.

3. The vented dust is routed through a connecting pipe to a Dust Recovery Tank. The DRT is fitted with an Air Cyclone that employs special features developed by Vortex Ventures Inc. to separate the air and suspended solid particles. The exhausted air is discharged from the Air Cyclone with particle size of less than 12 microns. A filter sock may be employed on the vent line from the Air Cyclone to further reduce solids particle release to the atmosphere. Solid particles with size greater than 12 microns are directed downward out of the Air Cyclone into the DRT. This process will insure minimal product loss. Care should be taken during the filling process not to over-fill the “P” Tank. This could cause downstream plugging in the pipe leading to the DRT.

4. A return line connected to the P-tank(s) inlet manifold from the bottom of the DRT is used with a Lobestar Eductor and air nozzle to form a vacuum pulling the barite or cement from the DRT while conveying the recovered material back to the “P” Tank. The DRT can be emptied after each batch of transferring is complete or anytime the high level alarm signals that the unit is full. A completely separate system is employed for the barite and cement. Each system has its own DRT.

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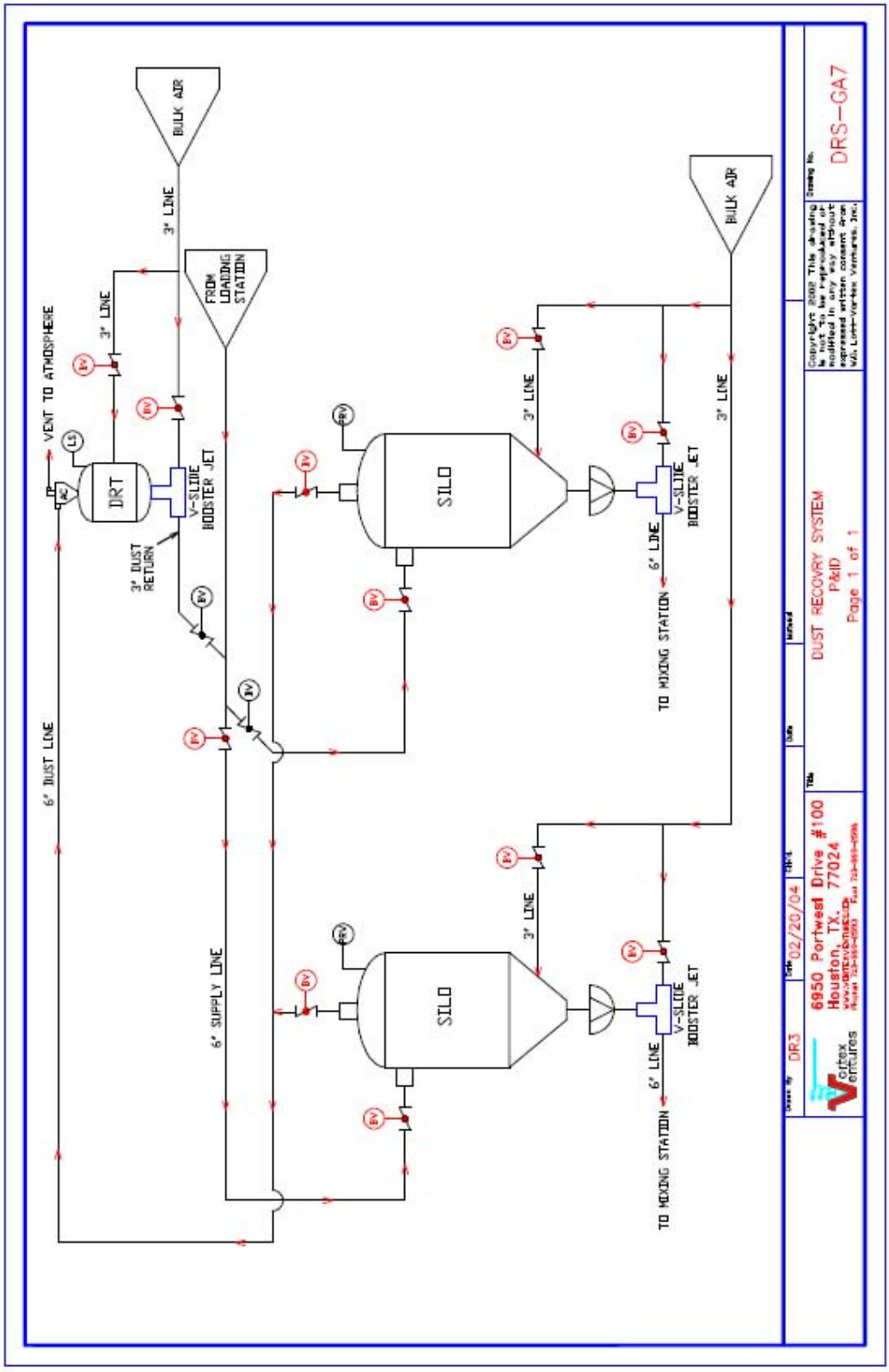
BULK AIR
3" LINE
FROM LOADING STATION
VENT TO ATMOSPHERE
LS
PI
AC
DRT
V-SLIDE BOOSTER JET
3" DUST RETURN
6" DUST LINE
6" SUPPLY LINE
SILO
SILO
TO MIXING STATION
6" LINE
DUST RECOVERY SYSTEM
P&ID
Page 1 of 1
6950 Portwest Drive #100
Houston, TX. 77024
02/20/04
DR3
DRS-GA7

OPERATIONAL PROCEDURES:

P-Tank Filling:
With discharge valve in the closed position, verify the tank is not pressurized. Open all valves between the vent line and dust recovery tank (DRT) and then open inlet line valve. You are ready to begin filling the tank with product.

The DRT is fitted with a high level switch. If this alarm is triggered the filling process shall be stopped and the DRT emptied.

NOTICE:
Operational parameters for the dust recovery tank's air cyclone is meant to handle the excess dust flowing from the silo's during the filling process and is not meant to handle repeated bursts of air from the silos after pressurizing them.

This may occur when the silos are pressurized to convey product and not fully relieved of compressed air through the bottom of the tank. Then the only other way to release the pressure is through the dust vent.

The silos have a 6" vent line that should be manually operated to slowly discharge the air through cyclones rather than in bursts, which will happen if operated with the valve solenoids.

DRT emptying:

The Dust Recovery Tank can be emptied by use of a Lobestar boost jet or by dense phased conveying.

> Using Lobestar booster jet:
> FIRST opening all valves between destination and the DRT discharge valve. SECOND verify any venting required at destination is prepared to receive the product to be conveyed. THIRD open discharge valve on DRT. Finally open valve to supply Lobestar jet with airflow. Use of a separate air source connected to the interior of the DRT aeration can be applied to fluff the product and assist the conveying process.

This aeration may require an internal air manifold or fluidizer nozzles in tanks that have a half angle greater than 35 degrees.

NOTICE:

This process requires a relief valve to be mounted on the tank and a gate valve installed between the Air Cyclone and DRT.

Using dense phase conveying:
With all valves in the closed position, begin to pressurize the tank to a minimum of 50psi. After minimum pressure is achieved, conveying can begin FIRST opening all valves between destination and the DRT discharge valve. SECOND verify any venting required at destination is prepared to receive the product to be conveyed. THIRD open discharge valve on DRT until empty or pressure drops below 40psi. To help prolong conveying periods additional airflow can be introduced while the discharge valve is open. Use of a separate air source connected to the interior of the DRT aeration can be applied to fluff the product and assist the conveying process. This aeration may require an internal air manifold or fluidizer nozzles in tanks that have a half angle greater than 35°.

Figures A and B are examples of internal aeration methods.

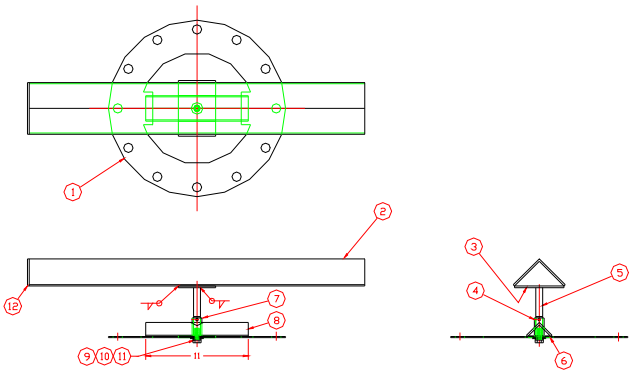

FIGURE A

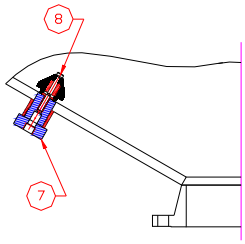

FIGURE B

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