

RBA Position Paper on the use of Ground-Based Pumps for Bitumen Discharge at Customer Sites

BACKGROUND

In the UK the majority of bitumen deliveries are made using pressure discharge from the delivery vehicle into the customer's tank. The RBA has reviewed the options and benefits of using a ground-based pump at the delivery site compared with pressure discharge.

The issue has been discussed in the past with the Environment Agency (EA) and their evaluation of the environmental implications is contained in statements in current EA Guidance Notes (e.g. PGN 6/42 – for bitumen processes).

In summary the EA position is that *the use of ground-based pumps can reduce emissions of bitumen fumes from delivery of these materials. It is not required at all processes (sites), but can be required to deal with site-specific odour problems.*

In 1999 an RBA study concluded that there are several significant safety and environmental benefits (see below) to be gained from using ground-based pumps for bitumen deliveries. A further study by the RBA HSE Committee in 2005 confirmed the previous findings. However this would require a major industry decision regarding the changes to existing equipment and procedures.

In more recent years, initiatives by the RBA Health Safety and Environmental Committee to reduce the incidence of tank overfills during bulk bitumen deliveries have reinforced the view that the use of ground-based pumps, for bitumen deliveries, could make a significant contribution.

CURRENT POSITION

The 2005 study reinforces the view that, depending on the existing site situation, there are the potential benefits of a reduction in bitumen spillages (and overfills) at the delivery point, a reduction in personal injuries as a result of spillages, a reduction in emissions during delivery and the possible nuisance to neighbours, as well as the wider safety benefits of not having pressurised hoses and pipelines. The detailed considerations are summarised as follows:

i) Safety Benefits

- The elimination of pressure discharge significantly reduces the risk of 'uncontrolled releases' of bitumen, some of which may be RIDDOR reportable.
- The risk of hose, joint and other failures is significantly reduced because the tanker and delivery hose are not pressurised.
- Product loss is minimised after the initiation of an emergency shut down or hose/hose connection failure because there is no stored energy in the delivery system.
- The elimination of compressed air hose/line clearance avoids the possibility of bitumen being blown out of the vent pipe at the end of the discharge and over pressurisation of a storage tank. It is important to ensure that vent pipes are kept clear at all times and that the vents on both the delivery vehicle and the storage tank are adequate for the pump capacity. It is possible that a blocked vent pipe may cause the storage tank to collapse as bitumen is pumped from the tank to the asphalt plant during use. This should be considered during the project Hazard and Operability Study (HAZOP) to avoid this possibility.
- Reduced chance of accidentally activating a high level alarm because;
 - There is minimal aeration of the bitumen.
 - There is less turbulence in the storage tank.
- The high-level alarm can be electronically linked by a trip switch to the ground-based pump, to stop it in the event of the alarm being activated.
- Safer method of uplifting Bitumen product from a storage tank.

ii) Environmental Benefits

- A reduction in the generation of bitumen fumes, because pressurising the trailer tank to clear the delivery hose/line is eliminated. With a pump discharge the only vapour created is that displaced by the bitumen received into the storage tank. Where there are particular nuisance issues for neighbours, this can also be reduced.
- The elimination of the compressor on the tractor unit, used for pressure discharge, means the engine does not need to be running during the delivery, so;
 - Eliminating engine noise.
 - Eliminating exhaust emissions.
 - Reduced carbon footprint for discharge operation
- Opportunity to reduce ground and water course contaminations through the general reduction in spillages and tank overfills.

- Has the potential to reduce the overall environmental impact of a customer site, assisting an Environmental Management System.

iii) Other Considerations

- In other European countries there are varying degrees of experience in the use of ground-based pumps for bitumen deliveries, but in recent years there is a trend to move away from pressurised discharge. In France in particular, over 90% of customer sites have installed ground-based pumps. They are moving towards 100% use, mainly because of the safety benefits.
- In the UK there are already a number of customer sites using ground-based pumps for bitumen discharge where the specific site situation has indicated a requirement (e.g. sites in urban locations).
- The bitumen suppliers recognise that as the trend towards ground-based pumps continues there is likely to be a lengthy transition period and there will be a need for bitumen delivery vehicles to carry compressors for many years to come.
- If required, the bitumen suppliers can provide information on the installation of ground-based pumps and other related issues, to ensure the optimum safe discharge of delivery vehicles.

SUMMARY

The current RBA view is that there can be a number of significant safety and environmental benefits to be gained from using ground-based pumps for bitumen delivery instead of pressurised discharge. It is intended to promote awareness of this within the industry and to encourage evaluation of the benefits on a site-by-site basis.

At this stage, the RBA recommends that the installation of ground-based pumps, for the discharge of bitumen, is considered for all 'new builds' and major plant upgrades/modernisation projects. The RBA also considers that of the installation of ground-based pumps leads to a safer and more environmentally beneficial operation and could be reasonable justification for upgrade or modernisation of a facility.

Bitumen suppliers will be able to deliver by both discharge options (pump or pressurised) during the transition period.