



Technical Paper

Maintenance and safety operations

Session 4-1

Explosion protection concept for liquid pumps of ATEX category 1

Author:

Dipl.-Ing. (FH) Matthias Himstedt
Physikalisch-Technische Bundesanstalt
AG 3.73 „Physical Ignition Processes“
Bundesallee 100
38116 Braunschweig, Germany



Pump Users
International Forum 2008

Summary

To increase the efficiency factor and safety of category 1 liquid pumps, the ignition hazard analysis and the requirements of monitoring devices have to be taken into account. The established certificates for category 1 liquid pumps require a minimum amount of liquid inside of the tank as a heat capacity and a minimum circulation volume of liquid through the bypass pipe to ensure the temperature class of the pump. In addition, the tank needs to be protected against ignition sources with a flame arrestor in the bypass pipe and with a foot valve inside of the pump. These autonomous protective systems require frequent maintenance to function reliably. This article provides guidance for the requirements of non-electrical explosion-protected equipment under application of monitoring devices, e.g. for flow and the liquid level inside of the tank, to avoid an ignition source in the interior of the pump. To complete the category 1 requirements for the outside surface the temperature of the pump body is limited. The requirements for the control of ignition sources for non-electrical equipment will be explained. All in all, an overview for submersible pumps in hazardous areas will be given.