

ATTACHMENT VIII
EXCERPTED FROM
UNION CARBIDE CORPORATION'S
COMMENTS ON THE PROPOSED EMISSION
STANDARD FOR VINYL CHLORIDE
DATED FEBRUARY 23, 1976

UCC 102657

Leakage from Relief Valves

61.65 (b)

"(4) Leakage from relief valves: Vinyl chloride emissions due to leakage from each relief valve on equipment in vinyl chloride service are to be minimized by installing a rupture disc between the equipment and the relief valve, or equivalent as provided in 61.66."

This item should be amended as follows:

"(4) Leakage from relief valves: Vinyl chloride emissions due to leakage from each relief valve on equipment in vinyl chloride service are to be minimized by installing a rupture disc between the equipment and the relief valve, or by having a formal program of relief valve testing and maintenance, or equivalent as provided in 61.66."

EPA's concern for relief valve leakage is based primarily on reactor or polymerizer control problems and a need for more knowledge in this area. A properly selected, installed and maintained relief valve is less likely to leak than any given shut off valve in an industrial plant. Union Carbide Corporation sets its relief valves at least 10% higher than the vessel's normal working pressure. The valve seats are lapped and the valve leak tested at its normal working pressure. If a relief valve is actuated, it is removed, cleaned,

the seats relapped and the assembly leak tested. If a relief valve is in service for six months in polymer service it is removed for cleaning and checking. If a valve is in clean service it is cleaned and checked annually. A recent survey of 76 relief valves in the dispersion resin plant showed no leakage by any relief valve. A relief valve is a rugged device machined to close tolerances as compared to a rupture disc which is basically a thin metal diaphragm that must be very carefully installed to avoid premature failure. Even a carefully installed rupture disc can leak or fail after a period of use due to metal fatigue or minor corrosion. EPA's statement that a rupture disc is less likely to leak than a relief valve is largely based on theory rather than industrial practice. While a thin metal diaphragm is less likely to leak than a lapped valve seat, this is true only as long as the comparatively fragile rupture disc maintains its integrity. When a relief valve is actuated by itself it vents off dangerously high vessel pressure and reseats. When a rupture disc and relief valve are in series and the vessel relieves, most of the time pieces of the rupture disc lodge in the relief valve seat and prevent its closing when the pressure is relieved. An even more dangerous situation arises when the rupture disc leaks vessel pressure into the space between it and the relief valve, thus effectively raising the vessel relief pressure by 100%. Such a situation leads to vessel rupture. This can be avoided by venting the space between the rupture disc and the relief valve to the air but then another potential emission source is created. The chemical industry has the knowledge and know how to select proper relief devices for its equipment. Union Carbide

believes safety valve leakage is not a problem and the specification of relief devices should be left to the industry. Leak testing and maintenance of relief devices on a regular basis should certainly be viewed as an equivalent to the proposal if not superior to it.

Union Carbide Corporation recommends that the item on relief valve leakage be amended as proposed.