

- 3 K. Gugan, Unconfined vapour cloud explosions, The institution of Chemical Engineers, 1978.
- 4 J.A. Davenport, A study of vapour cloud incidents – An update, 4th Int. Symp. on Loss Prevention and Safety Promotion in the Process Industries, Harrogate, UK, 1983, I. Chem. E. Symp. Series, No. 80, pp. C1-C19.
- 5 J.P. Zeeuwen, C.J.M. van Wingerden and R.M. Dauwe, Experimental investigation into the blast effect produced by unconfined vapour cloud explosions. 4th Int. Symp. on Loss Prevention and Safety Promotion in the Process Industries, Harrogate, UK, 1983, I. Chem. E. Symp. Series, No. 80, pp. D20-D29.
- 6 A.J. Harrison and J.A. Eyre, The effect of obstacle arrays on the combustion of large premixed gas/air clouds. Combust. Sci. Technol., 52 (1987) 121-137.
- 7 Recent research at the Prins Maurits Laboratory TNO, unpublished results.

### **Reply to the comment of Dr. A.C. van den Berg**

Damage analysis has many uncertainties. Knowing that, I used the word “involved” with respect to the mass of hydrocarbons generating an explosion pressure wave. I hoped it had the same blurred meaning as the German word “involviert”. Dr. van den Berg is certainly right to relate the pressure wave only to the portion of the gas where high flame speeds can be generated.

In the case of an exploding vessel the old BASF investigations show that only 35% of the contents are micromixed with air at the instant of optimum mixture. Since this is a constant ratio we related the strength of the pressure to the inventory of the vessel. By applying this relation to the ROW explosion, which was not a vessel rupture I should have spoken as well of the “well-mixed mass of propylene”, which I didn't. I used again the word “involved”.

As I said in my conclusions, damage analysis gives one a better knowledge about the spectrum of explosion accidents; I should have said “feeling”. This is rarely the case in occurred accidents and nearly impossible in assumed accidents for authority considerations – a well known problem for many of my colleagues.

Dr. H. Giesbrecht  
BASF AG  
D-6700 Ludwigshafen  
F.R. Germany