The common rift between academia and industry has existed in all fields of engineering. However, ultimately the rift can be seen as more of a lag; it is not so much a question of “academia is not the real world” but rather “academia is research which ends up finding its way into the practical world of industry years if not decades later”. On the topic of detonations or vapor cloud explosions (VCE), this is indeed a true statement. A little more than a decade ago the common belief in the chemical process industry was that detonations were not really possible unless you had some very reactive process materials such as hydrogen or acetylene. When some industry and consulting experts began to challenge this view they soon found out that a more common and less reactive process material such as ethylene could in fact be made to detonate as well. The key was that the environment had to be just right in order for an ignited flame to accelerate and transition to a detonation. In fact, academia had known this since the early 1960s and so the question remains, what else has academia known that we are to find out?

Industry has retuned itself and made use of a several common explosion modeling tools which for some can be made to predict detonations. In others, they must be inferred and only very knowledgeable users can determine detonations. This paper will review the basics of detonations, the academic perspective and the industrial applications. Additionally several of the various and commonly used models for explosion prediction will be reviewed.

**Keywords:** Detonations, VCE, explosion modeling, explosion prediction