ALTERNATIVES
TO VENTING GASES

The new EUB Directive 60 on venting, flaring and incineration is forcing operators to revisit their facilities and determine how they are going to comply with new venting restrictions. If waste gases cannot be conserved, producers will need to destroy the gas. Tornado Technologies Inc., a company at the forefront of developing combustion solutions for over 20 years, has recently developed a highly efficient and low-cost system that is gaining approval of major producers on both sides of the Canadian/US border.

One of the primary sources of waste gas emissions is the venting of production tanks, usually on single well batteries. As liquids are produced, residual vapors break out and form a blanket of gas contained at low pressure, generally with a thief hatch. This prevents oxygen from entering the tank and forming an explosive mixture. If liquid levels or temperatures increase, the vapours compress and relieve to atmosphere on an intermittent basis. Operators run the risk of non-compliance if this gas is sour and leads to odour complaints, or if excessive BTEX puts them in violation of their one tonne a year emission limit.

In the past, operators have installed condensing or cooling devices to reduce BTEX emissions and slide under the allowable one tonne threshold. Unfortunately, this solution incurs a cost and does not account for the possibility that thresholds may drop again in the future, most likely to zero. Tornado's new series of thermal oxidizers are an ideal low-cost solution that allows producers to be proactive and drop their BTEX emissions to zero.

There are essentially five alternatives to choose from when conservation of waste gases is not an option:

1. Vent to atmosphere - where applicable
2. Flare – allowable only if no smoking or odours occur
3. Air-assisted flare – requiring onsite power, reduces smoking concerns
4. Thermal oxidizer (TOX) – if less than 5% sour
5. Incinerator – if more than 5% sour (this option requires process/temperature controls, recording, and a reliable burner management system (BMS) interlocked to the plant).

Incinerators and TOX's are superior to flares in that combustion is contained within the unit and produces a much higher destruction ratio, thereby destroying all the gas. They also handle much heavier gases, which are typically problematic for flares and produce trace smoking.

The main difference between thermal oxidizers and full-blown incinerators is that the latter have full temperature or process controls and are, therefore, much more expensive.

Choosing between units depends on both economic factors (capital and long term operating costs) and safety concerns. The installation zone of the equipment will determine whether it's explosion proof or general purpose transient vapour. The more stringent classification requires a combustion air inlet arrestor.

In many cases TOX's are proving themselves to be the preferred combustion choice based on a cost-benefit analysis. A good example of this is a recent project for a major producer in Colorado involving the development of Tornado's newest thermal oxidizer – the TEC 4.

Tornado was approached by a company in January, 2007 to develop a unit that would address the stringent air quality venting regulations recently imposed in the area. The company had more than 100 sites where large volumes of gas were being vented from production tanks, and no existing technology could solve their capacity problems.

Tornado quickly developed a prototype solution, and spent the next three months working with the client to ensure the unit could handle every possible scenario. Now, rather than release raw, harmful production gases directly to atmosphere, Tornado's TEC 4 converts them to carbon dioxide and water vapor. The result is a reduction in greenhouse gas effect by approximately 95%. The company immediately ordered 100 units.

"The Colorado contract was earned for several reasons," said Les Weir, General Manager of Combustion Products for Tornado, "most importantly that we developed and delivered a unique solution in under three months where others have been trying for over three years." The TEC 4 specifically delivers extremely high turn-down and destruction ratios, operates on low pressures, requires no on-site power, maintains a cool surface temperature (which benefits safety and allows it to be painted neutral colors), and has a significantly higher capacity than any competitive product. And all at a cost effective price.

Tornado expects the TEC 4 will be recognized as a major advancement, and is already consulting with several other producers facing similar challenges. The Colorado project exemplifies Tornado's ability to develop and deliver cost-effective, technologically superior combustion systems.

Operators in Alberta will need to review their facilities and install or upgrade equipment to comply with the EUB venting regulations. If conservation is not an option, Tornado can provide a broad range of combustion related solutions to meet their specific requirements.