Determine the dispersion characteristics and tolerability criteria for gas released from the flare on a well site.

Develop a dispersion model and analyse results based on the tolerability criteria for the gases released.

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<th>Challenge</th>
<th>Solution</th>
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<td>To determine the dispersion characteristics for venting H₂S gas from the flare on a well site.</td>
<td>Developed a dispersion model simulating effects under ‘worst case’ atmospheric conditions.</td>
<td>A clear understanding of the dispersion characteristics of the released gas and its potential impact.</td>
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To prepare and take the necessary precautions to deal effectively with accidental releases of hazardous & toxic chemicals, customer requested United Safety to provide worst case scenario computer generated simulations of accidental toxic releases. This information was used to generate estimations of safe personnel and equipment locating for emergency response planning and regulatory compliance.

**KEY CUSTOMER BENEFITS**

**A strong understanding of the dispersion characteristics of H₂S and SO₂ and the impact it could have on the atmosphere and neighboring communities**

United Safety performed a series of release and dispersion calculations on a well site in an effort to quantify the dispersion of gas containing hydrogen sulfide (H₂S) from an uncombusted flare event and to quantify the dispersion of sulfur dioxide (SO₂) when the flare is operating. The releases were designed to simulate what would happen if a release from the flare occurred under “worst case” atmospheric conditions and to predict the downwind concentration of the toxic air pollutants. To ensure a clear visual representation of the effects, detailed graphic outputs of gas concentrations illustrating worst-case dispersion results were used.

**Tolerability criteria for H₂S and CO₂ were established in accordance to leading governing bodies**

Tolerability criteria were established for CO₂ and H₂S releases based upon exposure limits enforced by OSHA and recommended by ACGIH, NIOSH and Alberta guidelines. The analysis approach included:

- Gathering the required input data for dispersion modeling
- Establishing the tolerability criteria for CO₂ and H₂S based upon regulated exposure limits
- Performing batch dispersion runs for the chosen conditions
- Developing detailed graphical outputs from Canary modeling software

This gave customers a good idea of acceptable emission levels in their region.

**Customers can make more informed decisions based on the results of the dispersion model**

This tool equipped customers with more information and a sound knowledge of the effects of their actions. It enabled them to make informed decisions about planned well site expansion and also gave them a tool to justify and ensure that exposure limits are within industry-regulated standards.