Emissions Reporting During Detector Exceedance Events

OIL & GAS, CHEMICALS & PETROCHEMICALS

Data Sources

- Process Data Historian like OSIsoft PI, Honeywell PHD, AspenTech IP21, etc.

Data Cleansing

- The raw signals were cleansed to remove data outside of the detector/instrument range.

Calculations & Conditions

- Value Search was used to identify when a detector event was occurring.
- Formula was used to calculate the rate of change (derivative) of the detector signal.
- Formula was used to build a model of the detector signal during the times when the reading was out of range.
- Signal from Condition and Scorecard Metric were used to calculate the max pollutant concentration and total mass released greater than the detector limit.

Challenge

Environmental regulatory agencies have strict reporting requirements for plants emitting certain pollutants. When the instruments measuring the levels of these pollutants go down or out of range, actual pollutant levels must be estimated and reported out within a tight timeline. The calculations required for this type of reporting are complex and highly manual in nature, requiring immediate engineering assistance.

Solution

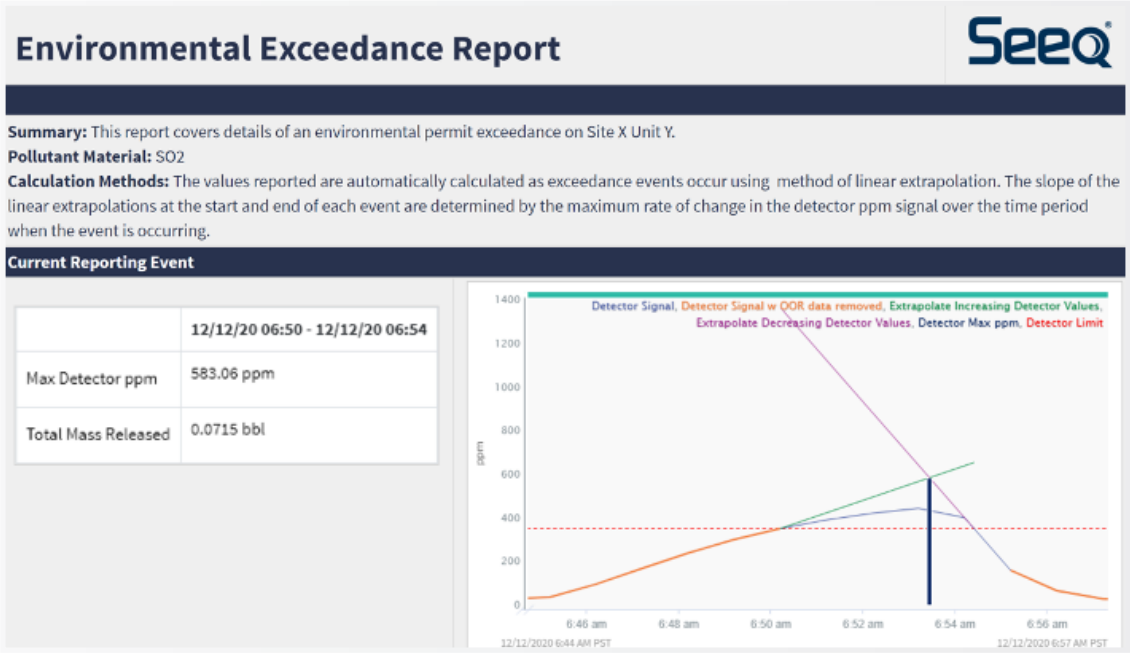
Seeq addresses this challenge with a variety of automatic calculations and auto-generated reports. Seeq can detect very specific events using combinations of conditions and then perform the necessary calculations to model the behavior of the detector signal using nested calculations in Seeq formula. The modeled signal can then be used to estimate the maximum pollutant concentration during the exceedance and the total mass of pollutant released beyond the max range of the detector.

Results

Transitioning this calculation and reporting workflow from manual and reactive, to automated and proactive, ensures estimates are reported to relevant agencies as soon as a detector limit event is detected, eliminates manual engineering efforts at the time of the event (particularly useful during off-hours), and ensures consistency in the calculation and reporting methodologies over time.

Reporting & Collaboration

- An auto-updating Organizer Topic was created to summarize the results of each exceedance event investigation and calculation that can be easily shared with management and external agencies as a link or PDF.



Shown in the picture: An example of a Seeq report detailing the most recent detector limit exceedance event. The table indicates the max concentration and total mass of pollutant beyond the detector limit. The trend shows an exceedance event for an instrument with set max and min range (outside of which, understanding actual values requires estimation/modeling).

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