



## CTG Digitalizes a Manual Process and Contextualizes Data for a Large Chemical Company

### Project Highlights

#### Information Management Disciplines Involved:

- Process Management
- App Development
- Systems Integration
- Business Intelligence
- User Experience

#### Technologies Used

- SQL Server
- Dundas Reports
- JavaScript
- Microsoft .Net/C#
- PAS PlantState Integrity

### The Client

Our client, a world-class chemical company, is a global integrated leader in thermoplastics and fibers who serves major customers in diversified end-use markets. The company develops and manufactures a multitude of innovative products for customer needs, including polyethylene, polypropylene, polyester fiber, spandex filament, as well as spun yarns, fabrics, and medical gloves.

### Challenges and Objectives

The company is responsible for ensuring that all chemicals meet specific standards for safe processing, storage, and manufacturing. As part of their daily operations, engineers and shift operators within the client's chemical plant must monitor anomalies in process unit data points, such as temperature, flow rate, and volumes, to identify "excursions," values that exceed specific "boundaries" or acceptable upper and lower ranges. The client engaged CTG to implement a system for identifying and maintaining "Safe Design and Safe Operating Limits" that indicated the upper and lower boundaries for the values of data points. Their goal was ensuring analysis was properly conducted when these boundaries were exceeded to identify the cause and capture the actions taken to address it.

### The CTG Solution

CTG developed and implemented an Excursion Management (EM) tool to allow the client's engineers and unit operators to accurately capture and analyze excursions. Following a traditional Software Development Lifecycle process, CTG's efforts began with business modeling and requirements gathering from the client's subject matter experts, the process unit engineers driving the solution requirements. CTG worked with the process unit engineers to gain access to the historical process data and capture the parameters for defining "good" and "bad" data. In addition, the solution required a well-designed application user interface to provide easy access and efficient grouping of excursions to obtain the necessary contextual information. CTG then performed systems integration to extract excursions from PAS PlantState Integrity, a set of tools that analyzes data from disparate sources to provide critical safety and production information that improves operator situation awareness.



CTG designed an intuitive, web-based app for the shift operators to provide input/assessment on excursions. The system notified engineers when excursions were identified, which triggered a review process where shift operators or engineers could view, validate, or comment on any excursions. The app also gave them the ability to view groups of multiple excursions within the same “event.” Finally, CTG helped the client create Key Performance Indicators and Business Intelligence reports, providing insight into the frequency and trends of excursions by process unit.

## Results

By partnering with CTG to implement the EM tool, the client’s engineers and shift operators are now able to accurately capture and analyze excursions. The tool allows engineers and operators to provide additional context and information about the excursions, such as the causes and how they were addressed.

The new ability to identify data anomalies and the institution of a formal data capture process, provide additional quality assurance to ensure excursions are properly identified and addressed.

The EM tool has led to the following findings and benefits:

- Promotes a focus on the “real” excursions, as opposed to known or expected excursions that were attributed to planned maintenance or outages
- Enables process unit leaders to identify the leading causes of real excursions, such as Control Loop design, operating errors, or unit upsets
- Allows engineers to quantify the number of equipment or instrument failure that led to “non-real” excursions and implement adjustments to maintenance and inspection schedules

