

DeltaV@CMU **Prototype Details**

Carnegie Mellon University

Masters of Human-Computer Interaction
Capstone Project

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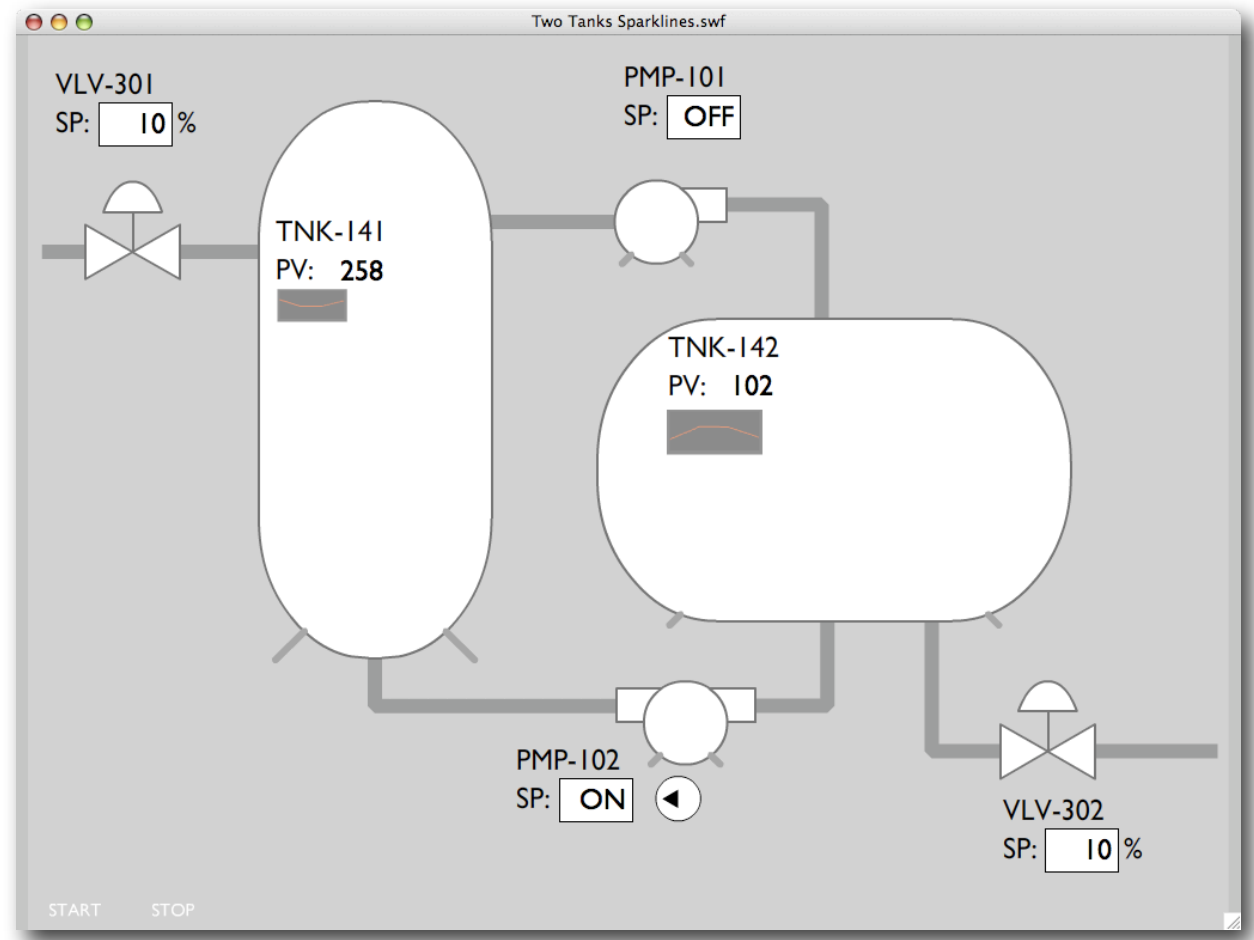
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Integrated graphs

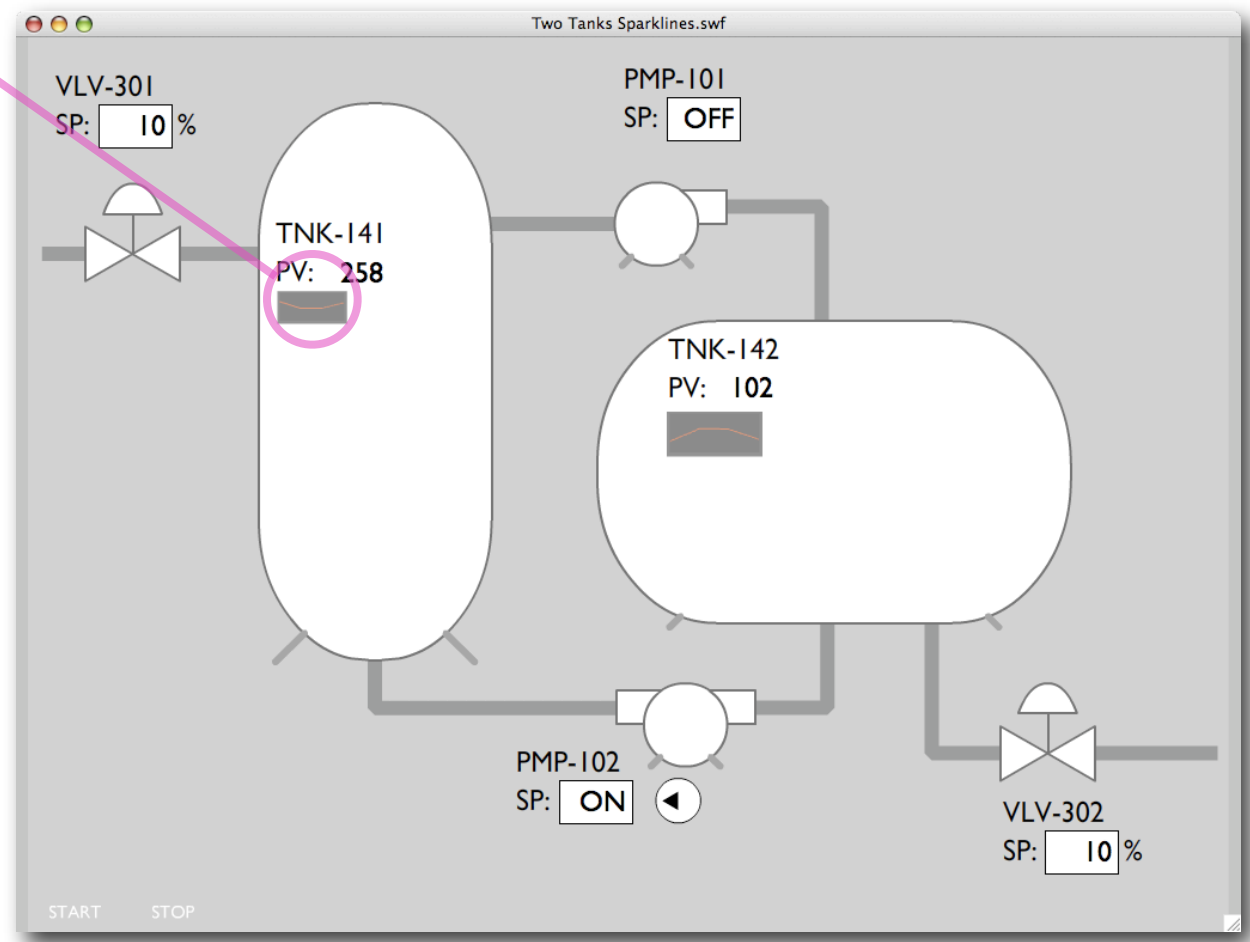
This prototype integrates Sparkline-like graphs into components on the operator control screen. This was done because the Monitor and Trend Analyzer roles are often fulfilled by the same person. It also helps to increase situation awareness.



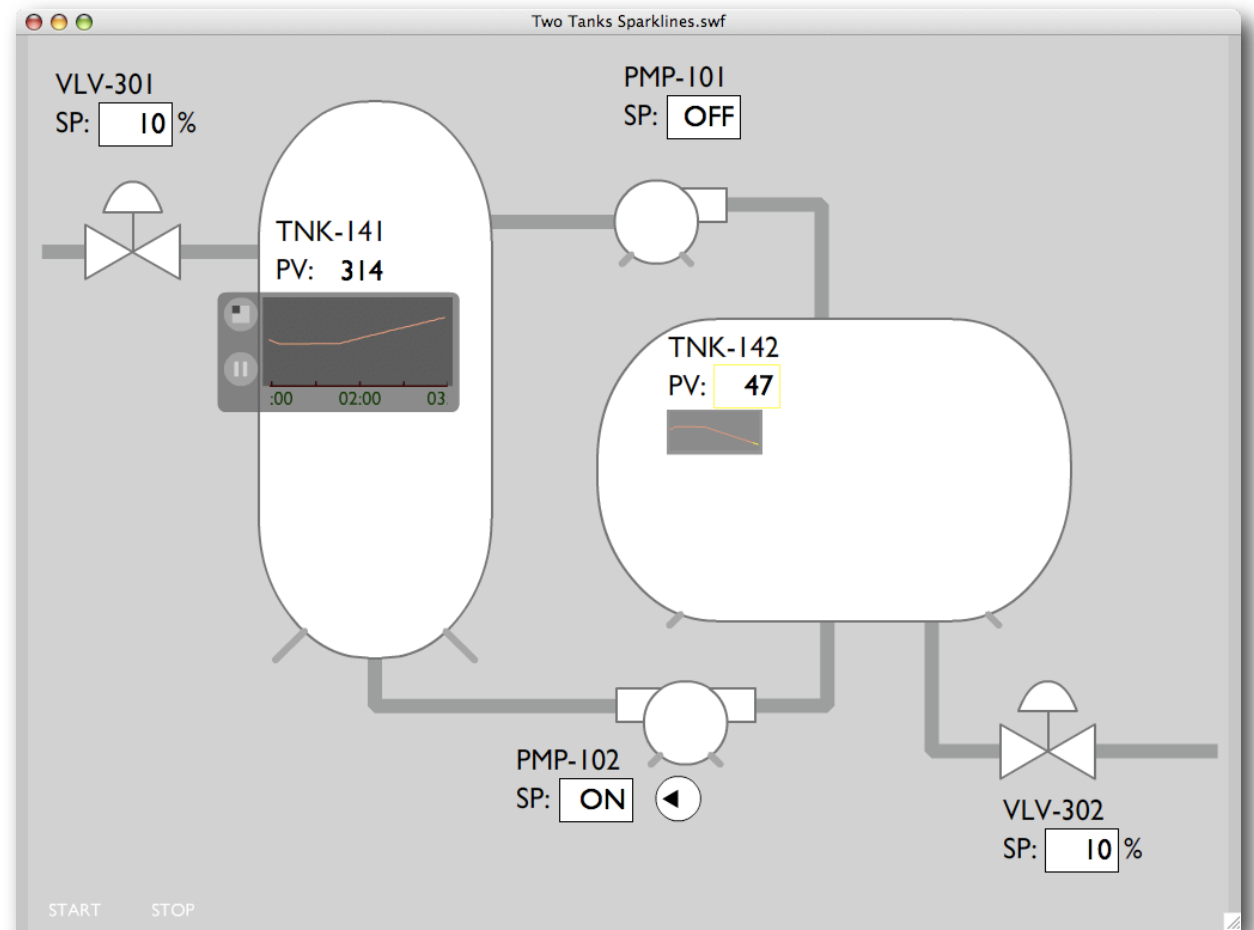
Integrated graphs

Sparkline-like view

A compact trend of component PV is integrated in the display. It shows values over time to give contextual and historical information to aid in knowing where values were in the past and predicting where the trend will go and



Integrated graphs



Integrated graphs

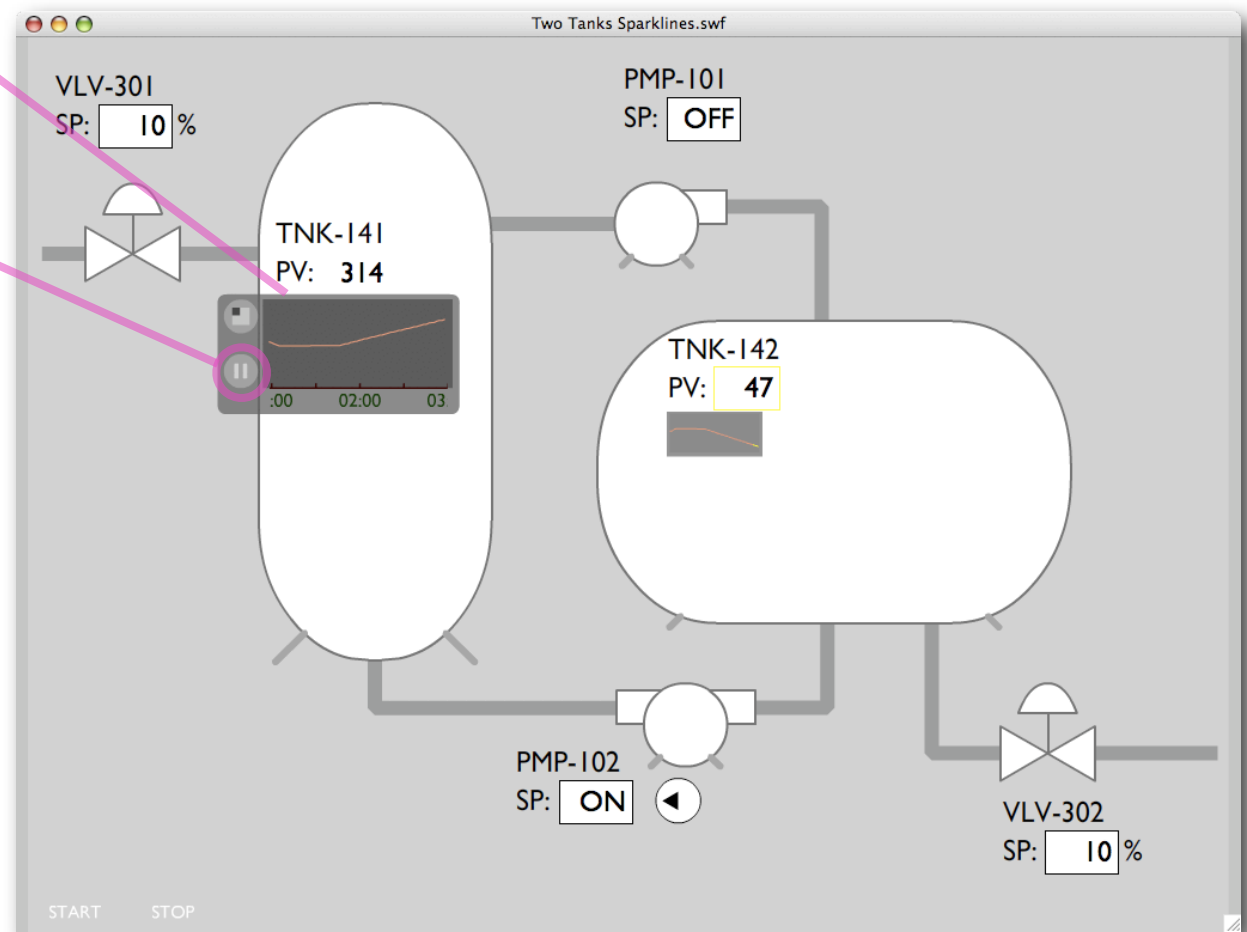
Integrated controls

When the mouse cursor is over a compact trend, the trend enlarges and controls are displayed.

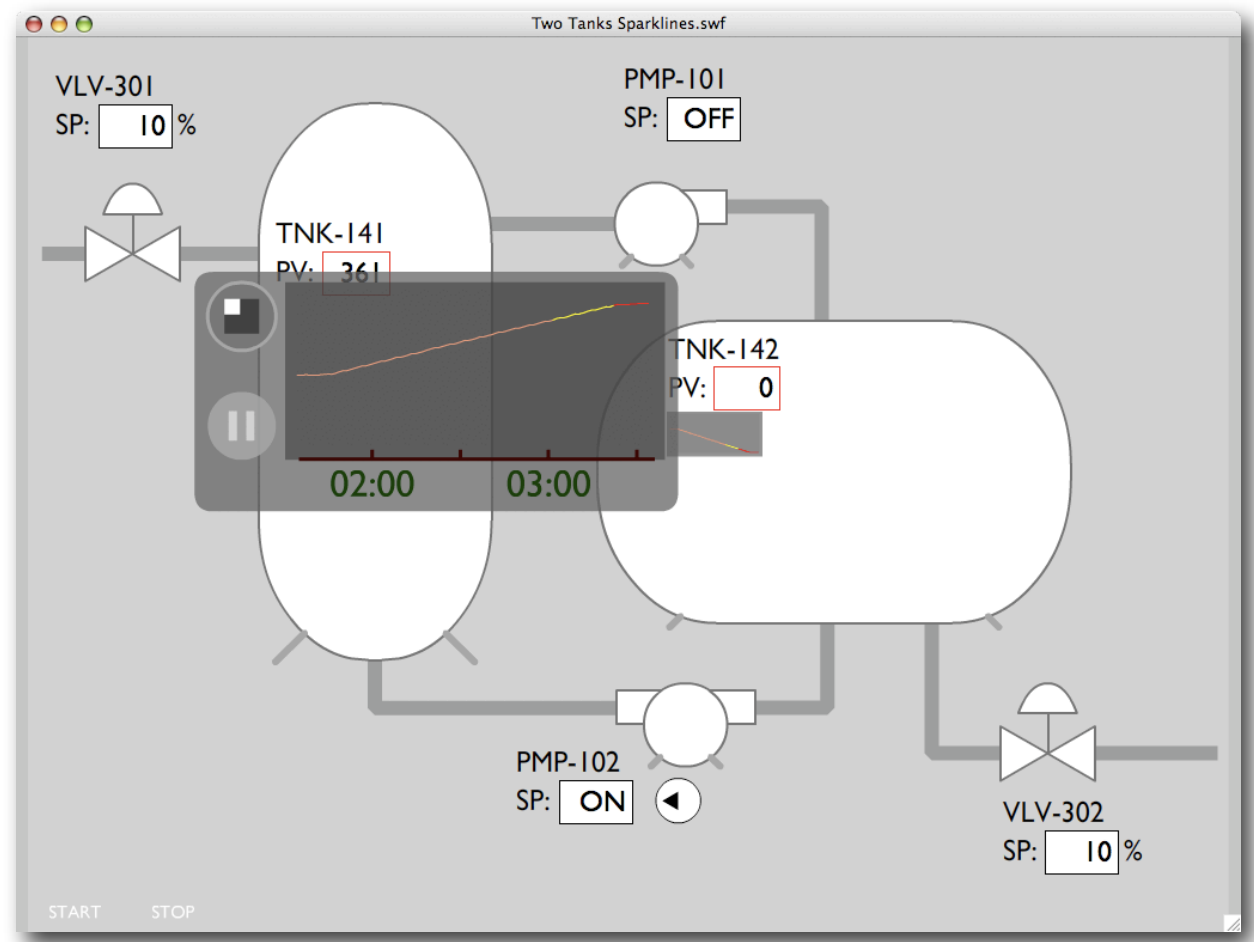
Pause button

The button in the lower left can be used to temporarily halt the graph, or pause it at an instant in time. Naturally, the process will not be stopped, only the plotting of the trend itself.

In order to avoid operators inadvertently leaving the graph in a paused state, once the rollover state is left, the graph is unpaused automatically and snaps to the current time.



Integrated graphs



Integrated graphs

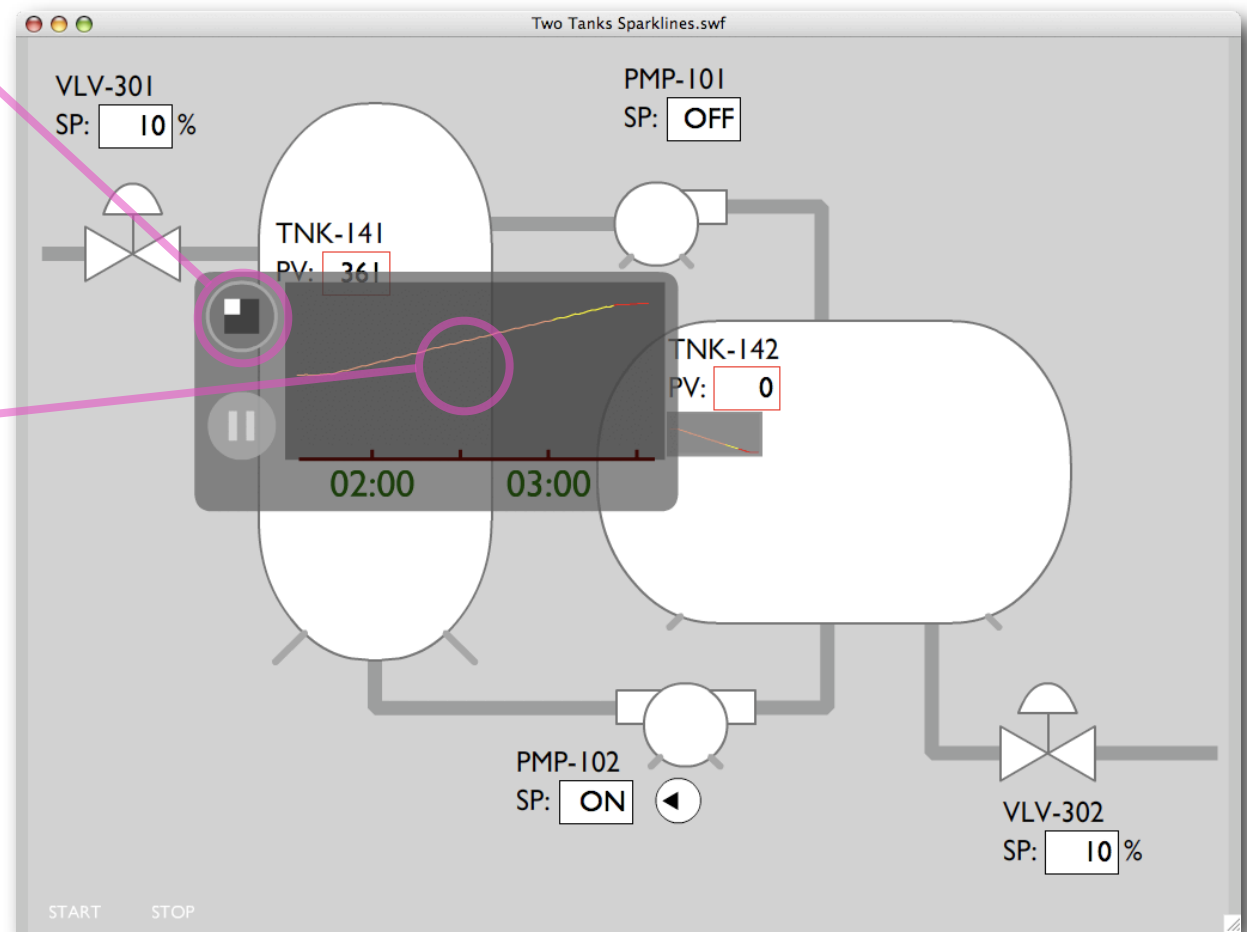
Enlarge button

The button in the upper left of the graph can be used to zoom in on, or magnify the graph. Clicking it again shrinks the graph back down.

This screen shows the graph enlarged. The previous screen shows it at normal mouseover size.

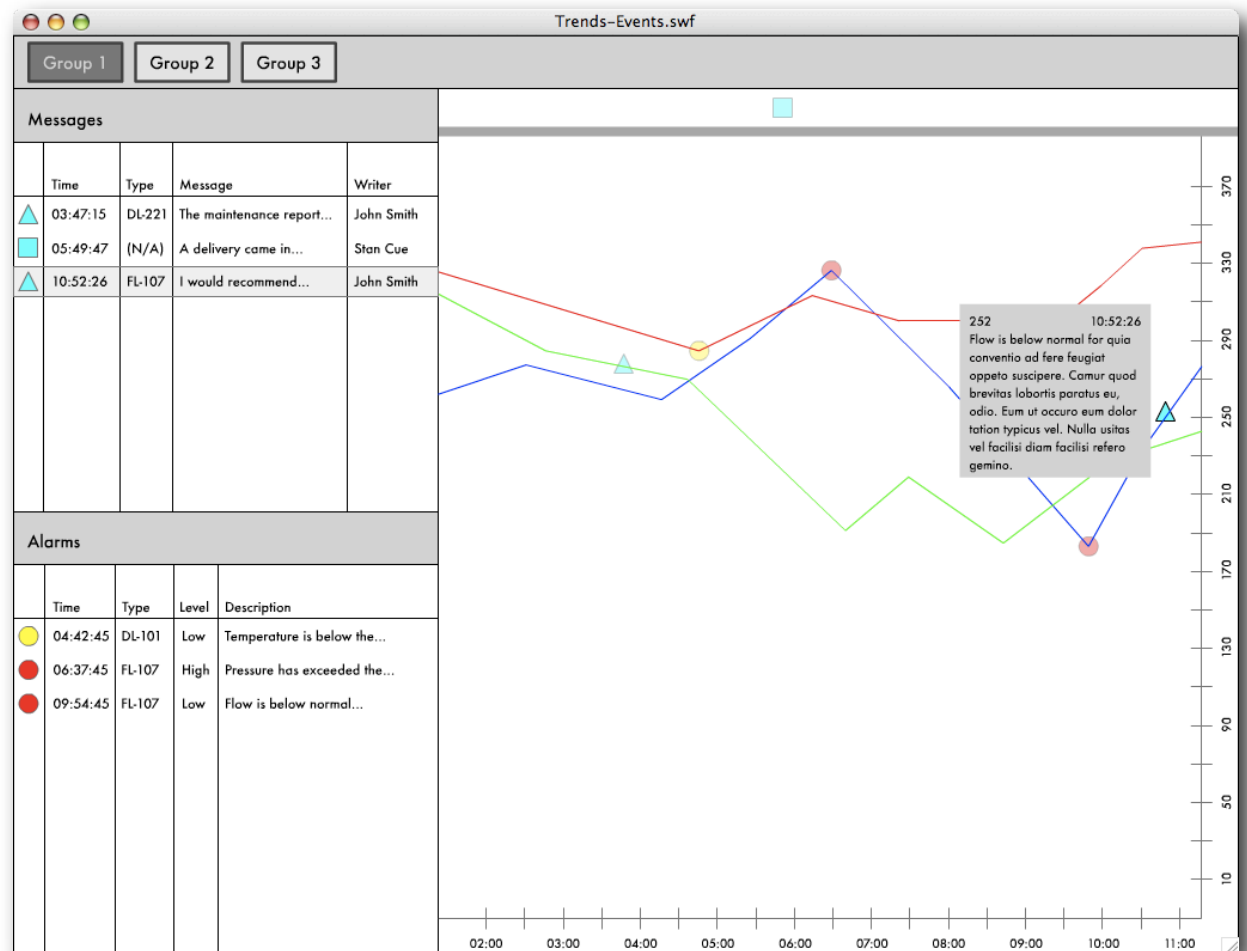
Direct manipulation

In any of the states, operators can also click directly on the trend and pan back through history for the component.



Trend & events screen

This is a prototype of a full-screen trends display which features the ability to display user-created messages which have been attached to particular trends or components. This fulfills the need for a fullscreen consolidated view of alarms and messages.



Trend & events screen

Messages on trends

Messages left by other workers appear as small, light blue triangles on a particular trend line plotted against the horizontal time axis.

Message highlight

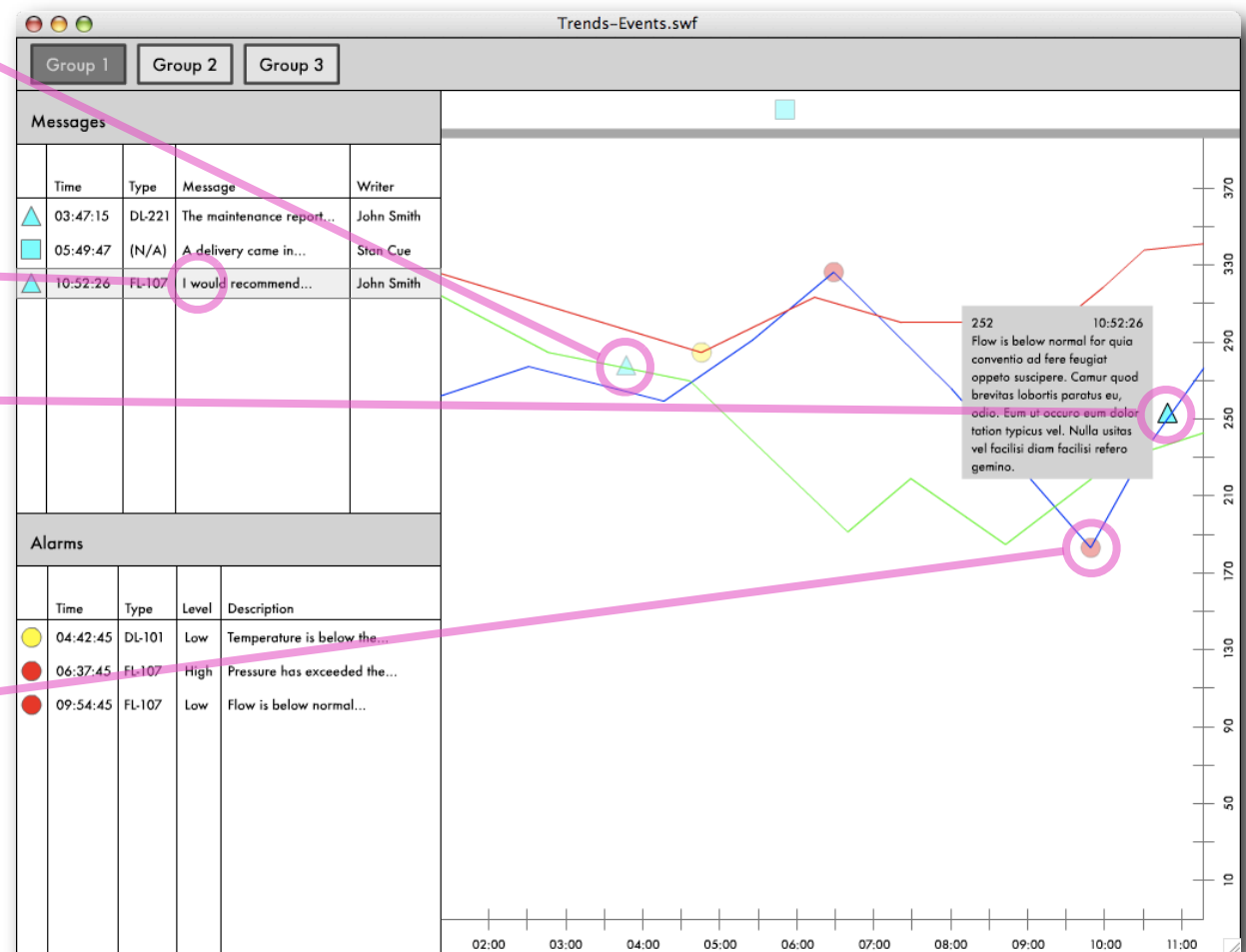
When a message in the message list is clicked on, it is highlighted as well as the corresponding message triangle on the trend line.

The same is true the other way around—when a message triangle is clicked on, it is highlighted as well as the corresponding message in the message list.

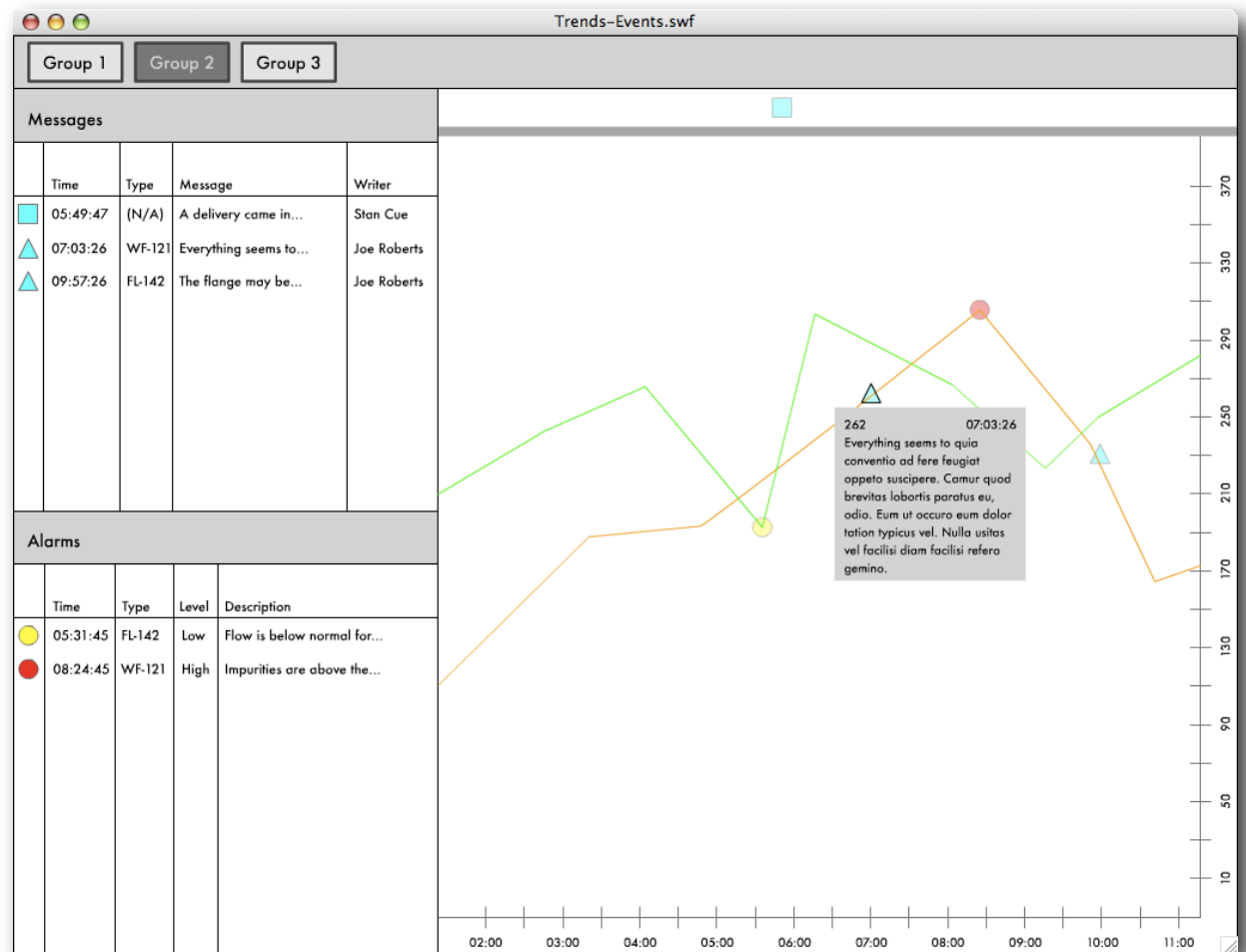
Alarms on trends

Alarms appear as either yellow or red circles representing warnings or critical alarms, respectively. The alarms appear on the trend lines they are associated with and they are also vertically aligned with the time at which they occurred.

Alarms feature the same highlighting and messaging features as operator-created messages.



Trend & events screen



Trend & events screen

Grouped trend views

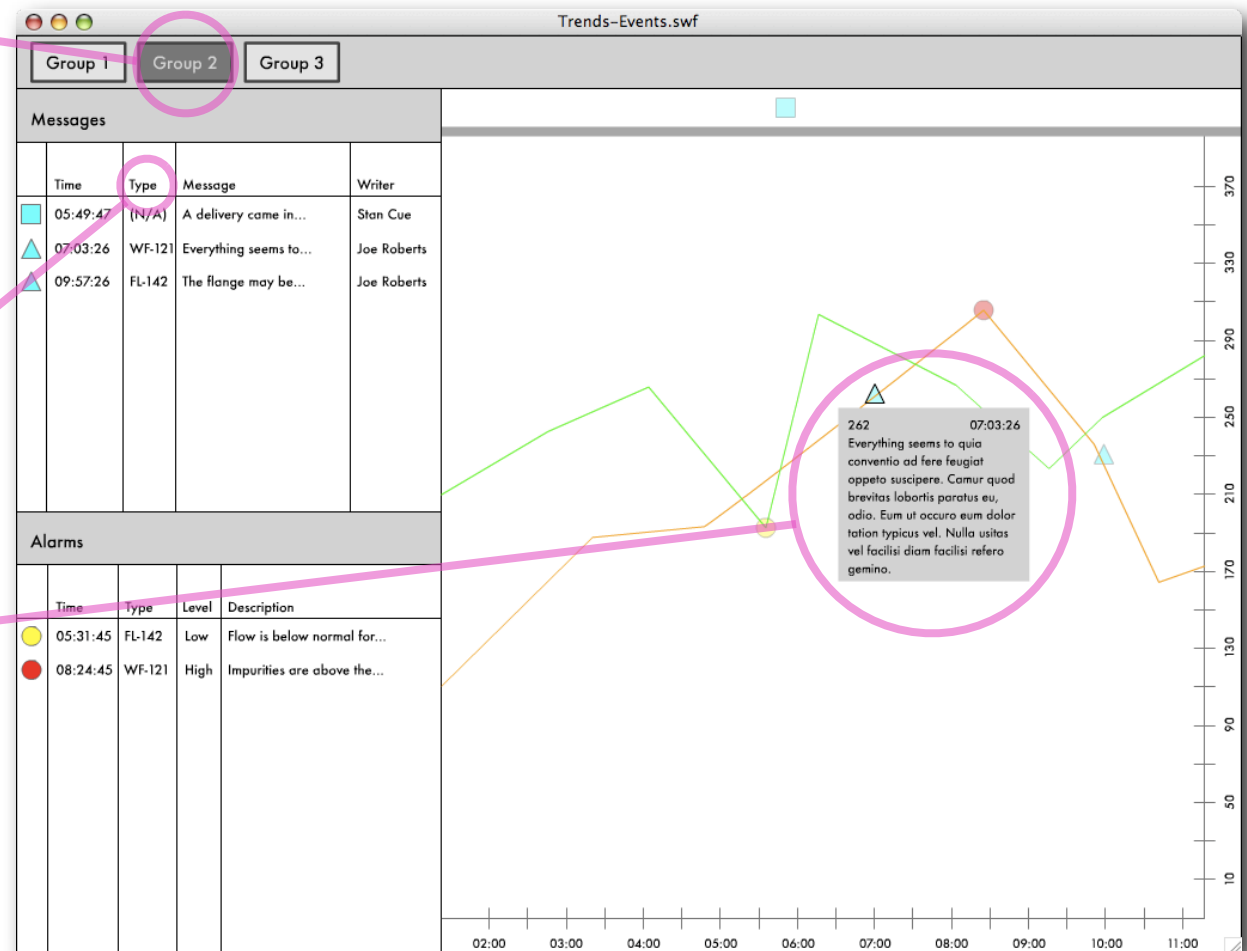
Operators can customize which components' trends to see together in one view and create a name for that view. Several different custom views can be created and will appear as buttons or tabs at the top of the screen.

Sorting messages

In the messages and alarms lists, the operators can sort the information several different ways. For example, the alarms list can be sorted by time of alarm, type of component, or level of alarm.

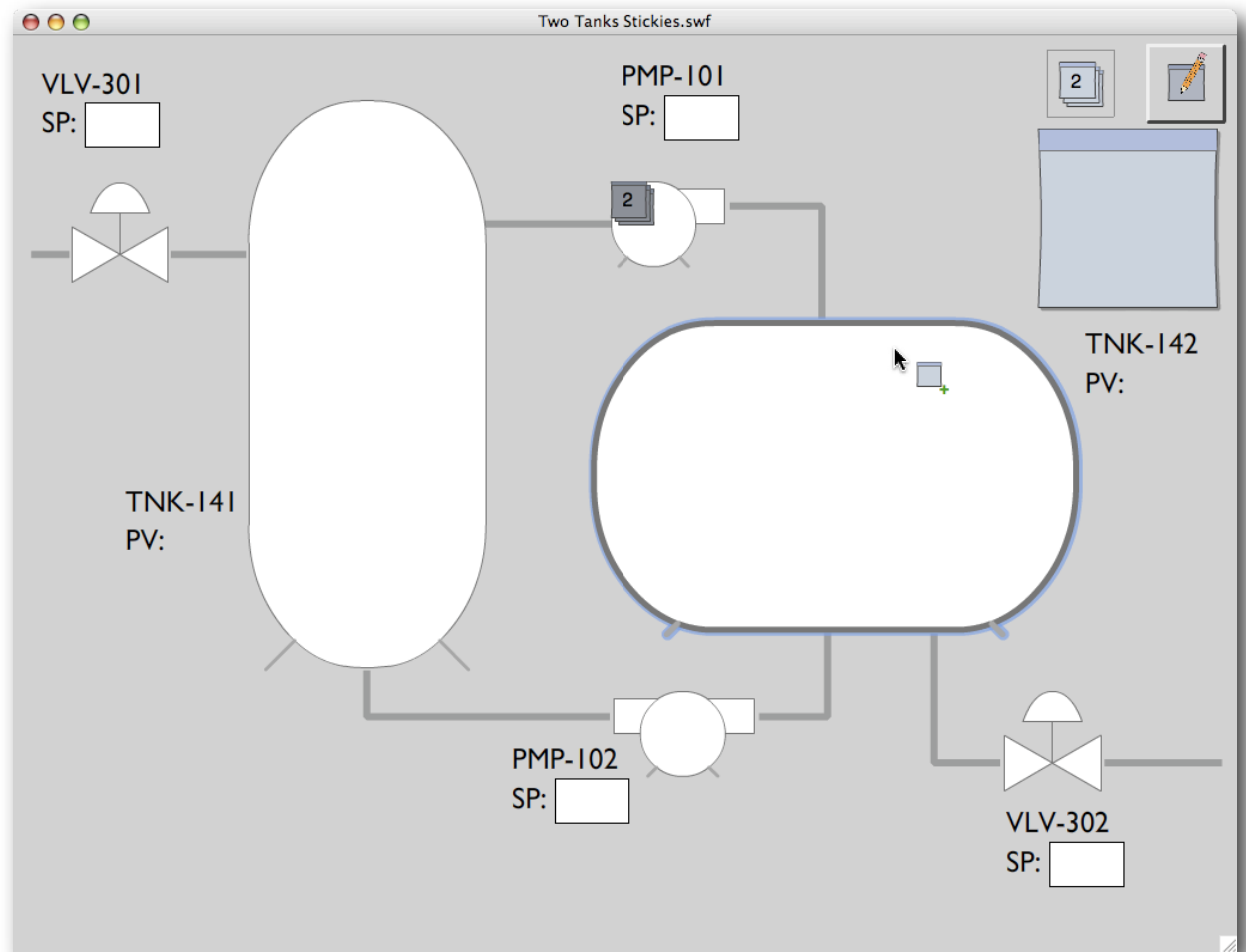
Message pop-up

Clicking on a message triangle or alarm circle on a trend reveals a pop-up if a worker has a message attached to it. The pop-up displays the full message, time message was created, and author of the message.



Stickies attached to components

In this prototype, messages are integrated into the operator control screen as "stickies," which can be attached to components. The hope is that this will help facilitate Monitor to Monitor communication, as well as enhance situation awareness.



Stickies attached to components

Message creation

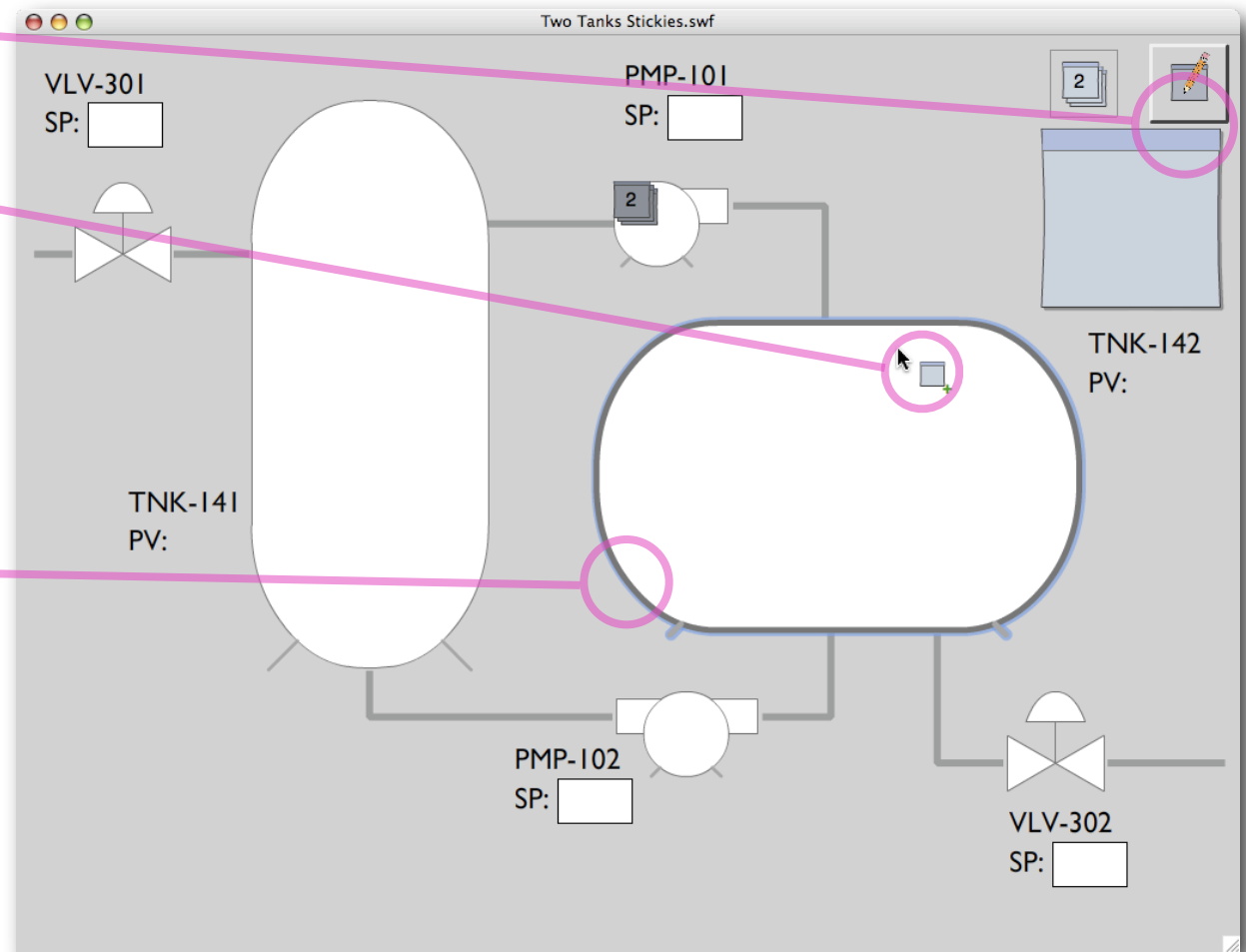
New messages appear as stickies near the button which created them.

Drag-n-drop

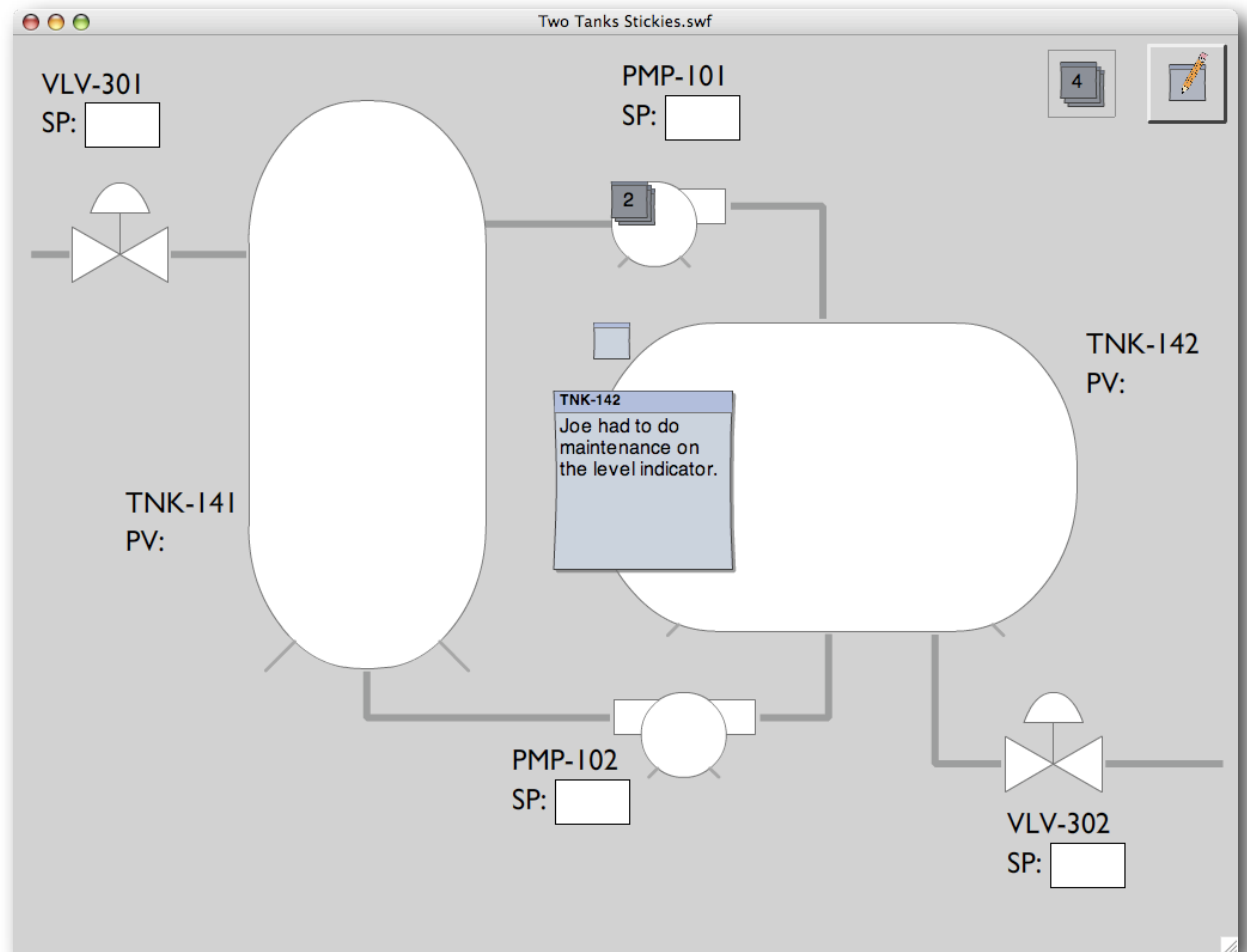
Dragging a general or unattached message over a component causes the sticky to change into a small icon next to the mouse cursor.

This icon indicates that this particular message can be attached to the component under the mouse cursor.

The component highlights itself to make it clear exactly which component the message will be added to. The lines which form the component have been bolded and have a slight blue-grey glow.



Stickies attached to components



Stickies attached to components

Messages indicator

When a component has a message attached to it, an indicator appears. The indicator is dimmed and tinted grey when the stickies are not being displayed but highlights when the stickies are displayed.

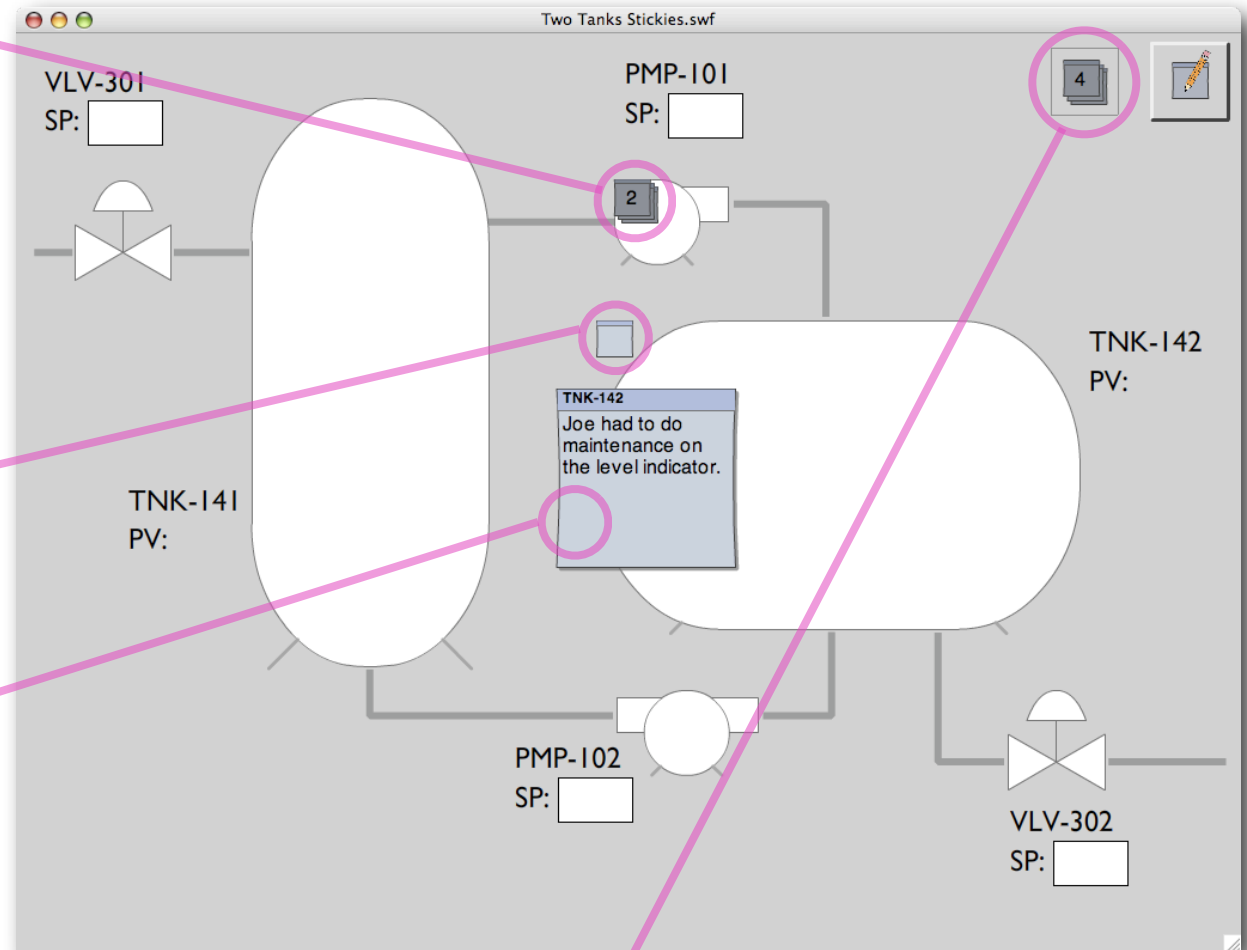
The indicator contains a count of the number of messages when there is more than one.

In this particular design, stickies are only visible for one component at a time. When an indicator for a particular component is clicked on, the stickies for all other components are hidden.

Blue-grey color

The traditional yellow color for stickies would indicate a warning or alarm, while straight grey stickies would not stand out from the interface as something user-created and special.

We decided on a blue-grey color, which stands out from the greyscale engineer-created graphics but is not loud enough to distract from anything of critical importance.



General messages

Since not all messages are component-specific, we added an indicator for "general" messages.