Hydrogen Gas Detection System

Industry: Power
Product: Network Solutions
DXAdvanced
GD402

Introduction
A major power company in the Southeast decided to replace its hydrogen gas detection system. The current system was unsupported by the manufacturer and failing. The new system would need to duplicate the functionality of the old to minimize the training and impact on the operators. Yokogawa was asked to facilitate the project.

Application
Many power stations use hydrogen to help cool their turbines. Hydrogen has a better heat transfer coefficient than air, but also the drawback of being explosive when mixed with oxygen. Cooling turbines this way calls for a hydrogen gas detection and alarming system. A new hydrogen gas detection system is what the client requested. The new system needed to be able to work in three modes - % Hydrogen in air, % Hydrogen in Carbon Dioxide and % Air in Carbon Dioxide. The system would need to clearly indicate which stage of measurement it was displaying as well as trending and alarming on certain levels.
Solution
Yokogawa’s DX Advanced and GD402 was the solution for the hydrogen gas detection system. The GD402 senses the % Hydrogen while providing feedback on which mode it is in (Hydrogen in Air, Hydrogen in Carbon Dioxide or Air in Carbon Dioxide). The GD402’s information is relayed back to the DX Advanced via analog and discrete inputs where it is converted into trends and digital indications. The DX Advanced uses its math logic capabilities to efficiently translate the GD402’s signals to switch detection modes and ensure the operator is always seeing the correct reading. Once the signals enter the DX Advanced all of its capabilities including alarming, data logging and network connectivity become available to the power station. Yokogawa’s DX Advanced and GD402 is now a proven replacement for L&N’s failing systems; Yokogawa’s system can quickly be deployed at new facilities with very little engineering effort.

<table>
<thead>
<tr>
<th>Relay 1</th>
<th>Relay 2</th>
<th>DX1004 Display changes</th>
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</thead>
<tbody>
<tr>
<td>H Purity</td>
<td>0</td>
<td>H purity AO1 from GD402 1 to 5 VDC scale 85 to 100% H</td>
</tr>
<tr>
<td>Mode Replacement</td>
<td>1</td>
<td>CO2 to Air AO2 from GD402 1 to 5 VDC scale 0 to 100% CO2</td>
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<td>1</td>
<td>H to CO2 AO2 from GD402 1 to 5 VDC scale 0 to 100% CO2</td>
</tr>
</tbody>
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Relay 1 terminal 20 - 21 NO contact
Relay 1 terminal 22 - 22 NO contact