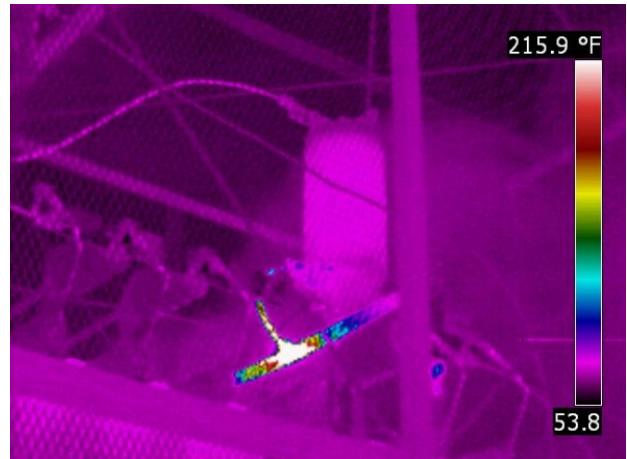


Infrared Thermography Prevents Devastating Damage

Timely Repair of Overheated High Voltage Connection

Site: Total Petrochemicals – Carville, LA
Area: Styrenics complex
Asset: Reactor Buss Bar Connection
Date: March 2010
Analyst: Bill Ruiz
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A potentially catastrophic electrical fault was discovered at Total Petrochemicals in March 2010 during a routine annual infrared thermography survey performed by Azima DLI. The reactor appeared to be operating normally but the infrared inspection revealed a faulty wire connection and critical heat damage to the aluminum bus bar that would otherwise have gone undetected until failure.

The temperature measurements recorded at the connection on the jumper wire from the reactor to the bus bar were > 800 degrees F. Significant bowing in the aluminum bus bar was also visible. Azima DLI reported the critical problem to Total Petrochemical's electrical department supervisors. Total made the decision to take the capacitor bank out of service immediately to avoid devastating damage to the equipment and to eliminate the danger posed to personnel working in the area.

After further investigation plant personal discovered an improper clamp on the jumper wire connected to the bus bar resulting in a loose connection on the jumper wire and bus bar.

Had the capacitor failed, Total Petrochemicals could have incurred a significant penalty usage charge of \$30,000 per month from the utility company; and even though catastrophic failure was avoided, the capacitor was still out of service approximately one week waiting on new parts and components. There is no way to accurately estimate the avoided cost of potential collateral damage to costly nearby equipment, possible harm and injury to personnel, and extended repair time had the electrical fault gone undetected until failure.

Total Petrochemicals USA, Inc., Carville, LA Styrenics complex (Styrene Monomer, part of the chemical branch of Total S.A.), is a worldwide producer of polypropylene, polyethylene, styrenics (including polystyrene), base chemicals, and transportation fuels. Throughout Total Petrochemicals USA's history, the company has developed ideas, products and services that have made it one of the top suppliers in the world. Total Petrochemicals leverages synergies with Total's refining business, particularly in Europe and the United States. Synergies extend to its exploration and production segments, mainly in the Middle East, but also to its expanding presence in Asia.

Total Petrochemicals has relied on Azima DLI infrared services to support its electrical PDM program since 1997. Bill Ruiz of Azima DLI has been involved since program inception. Ruiz is a level II analyst, certified by the Academy of Infrared Thermography, and performed the above noted inspection at Total Petrochemicals in March 2010. Ruiz has served the petrochemical, refineries, offshore drilling, and manufacturing and textiles industries since 1998. He specializes in performing infrared surveys and analysis of process systems, direct equipment, furnaces and boilers, electrical distribution grids, and machinery and mechanics using state of the art equipment and software to produce the highest quality infrared surveys and related corrective recommendations.

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