

High Pressure and Temperature Nitrogen Heating System

Case History 350-3

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Application

A rocket launching facility in Southern California required a nitrogen heating system as part of their pre-launch procedure. The system required circulation heaters that could handle high pressure and temperature nitrogen. The heaters and control panels needed to be rated for outdoor use and be suitable for use in a Class 1, Division 1, Groups B,C,D hazardous area.

Design Requirements

Two systems were required each with redundant backups. The first system needed to meet design temperature of 200°F at 900 psig with a flow of 1,700 SCFM. The second system design requirements were 850 SCFM at 250°F and 1180 psig. The circulation heaters needed to be ASME section VIII, Division 1, code stamp U certified with the vessels constructed from 304 stainless steel and element sheaths of Incoloy 800. NEMA rated 7/4 control panels for outdoor Class 1, Division 1, Group B,C,D use.

Solution

The first system required an ASME, 6-inch, 145 KW, 15 element circulation heater with 600 pound 304 SS flanges. The 80-inch long vessel was constructed from 304 SS with 2-inches of fiberglass insulation and covered with a 16-gauge 304 SS jacket. Incoloy 800 0.475-inch diameter elements were rated at 30 watts per square inch. Control panel rated NEMA 7 (explosion-proof) / 4 (weather-proof), Class 1, (vapors), Division 1 (hazard always present), Groups B,C,D (hazard potential for gases) were furnished with process and high-limit thermocouples and digital display controllers, full power SCR controllers and full function operational and alarm indication for local and remote DCS control were included.

The second system was similar to the first with a 75 KW rating with 12 elements, 6-inch diameter vessel that was 45-inches long. Control panel as above used full SCR control.

INDEECO Advantages

INDEECO's experience with explosion-proof applications and ability to offer ASME certified circulation heaters were major factors in INDEECO being chosen for this job. INDEECO had previously provided similar heaters to this company so we were well known to the customer. Bill Magill commented "when you do a professional job and do it right the first time the customer will remember you and there will always be an opportunity to get repeat business." This job is a testimonial to Bill's philosophy as it is the third job that we have done for this customer and they have come to rely on INDEECO.

For additional information on this application contact:

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