



Gas Plant Control/SIS System

RTP Solutions for the Hydrocarbons Industry

Application

Basic Process Control and SIS for Russian Gas Plant

Benefits

- ◇ BPCS and SIS in same controller
- ◇ Lower cost of Installation
- ◇ All Operator's Stations in Cyrillic
- ◇ Ease of implementation and maintenance

Overview

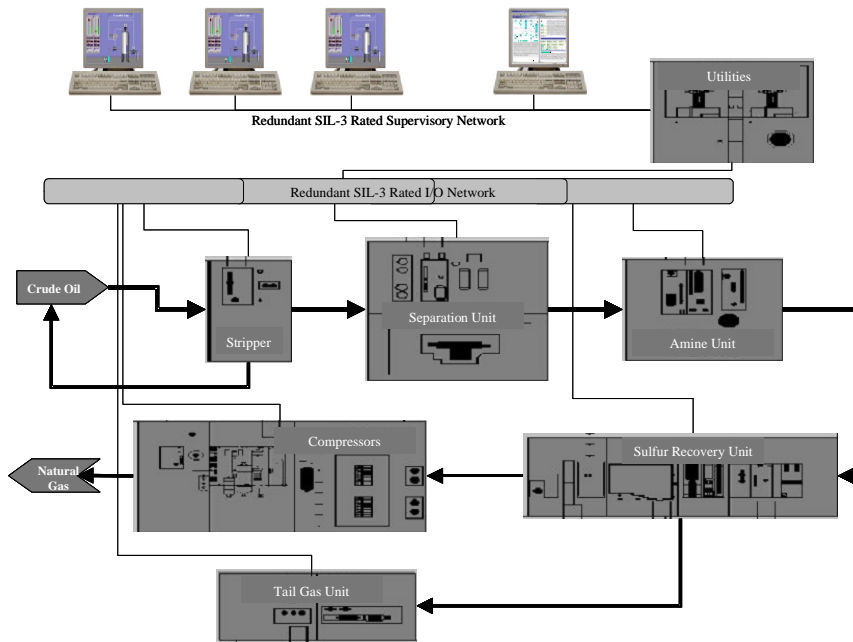
Located in the southeastern part of the East European Plain, in the Lower Volga Region, the Saratov Region covers a total area of 100,200 square kilometers. The area has rich deposits of oil and gas. When the decision was made to construct a 52 mmcf per day gas plant, the owner began to look for an economical yet highly reliable Basic Process Control System and an easily integrated Safety Instrumented System.

The plant extracts crude from the owner's fields. The crude and gas are separated and the crude pumped back into the crude line.

From there a sour water stripper strips the water from the gas. Then the gas goes through an amine unit that strips the H₂S from the gas. The natural gas then proceeds to a compressor and into the natural gas pipeline.

The H₂S goes through a Claus Sulfur Recovery Unit where the elemental sulfur is extracted. Remaining tail gases are sent to a tail gas unit where they are burned.

The plant was manufactured on skids in Houston, TX and transported to Russia where it will be assembled and operated.



3000 Controller Family

RTP offers a complete family of high-integrity Safety Instrumented Systems, all following the standards of IEC61508. For the highest level of integrity and availability, the 3000-T Triple Modular Redundant System features 2oo3D voting with triple, dual, or simplex I/O to obtain the required SIL rating.

The 3000-D Safety Instrumented System is built on the same advanced technology as the 3000-T, for dual redundant 1oo2D solution. The 1oo2D voting uses advanced diagnostics to assist in results adjudication. According to IEC61508, 1oo2D systems can achieve the same SIL rating as 2oo3D systems. The 3000D features dual-redundant processors with triple, dual, or simplex I/O as required.

When processor redundancy is not a requirement, the 3000-S Single processor configuration provides integrity and availability that exceeds that of competing single systems. With its built-in data validation schemes and redundant host communications, secure measurement and control are achieved.

The 3000-T, 3000-D, and 3000-S support up to 16 chassis of I/O providing

RTP Corp.

1834 SW 2nd Street
Pompano Beach, FL
33069

Phone

954/974-5500

Fax

954/975-9815

E-mail

rtinfo@rtpcorp.com

Web

www.rtpcorp.com

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Control and Safety Solution

One redundant RTP 2500D was selected as the Basic Process Control System (BPCS) and the SIS for this project. The RTP controller is TÜV approved for use as a BPCS and an SIS in the same controller. It also has safety rated I/O and non-interfering I/O. This allowed the owner to use lower cost, higher density non-interfering I/O for BPCS loops and lower density, SIL rated I/O for safety loops.

The redundant controllers were located in the Utility area with remote I/O drops at each processing unit. The redundant SIL-3 rated I/O network was routed to each processing unit over fiber optic cable. Since the same controller was used for BPCS and SIS, only one redundant network needed to be run through the plant, significantly reducing installation costs over that of alternate solutions.

The operators would be more comfortable in Cyrillic, so all of the graphics were done in English and Cyrillic. The operators use the Cyrillic annotation, making it easy for them to operate the plant while engineers and maintenance technicians who might be more comfortable in English can convert the screens to English if needed.

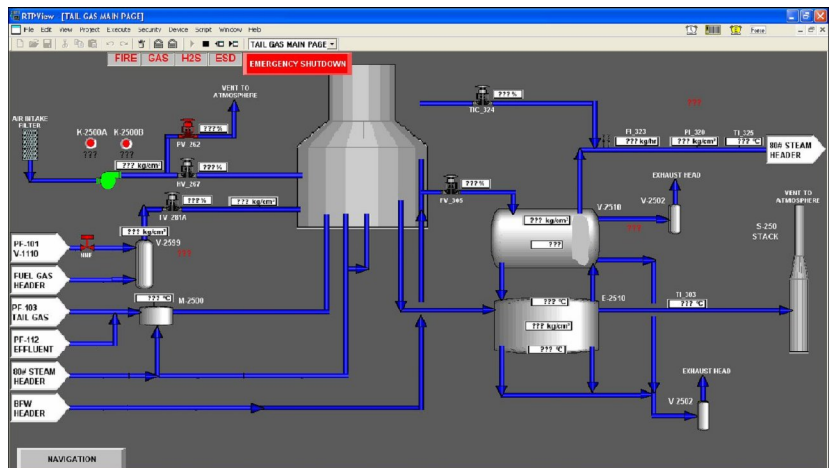
Approximately 150 operator's screens were created to allow easy operation of the plant.

Ease of Use

The final decision criteria was ease of use. In this case, ease of use meant two things.

First was ease of implementation. The control and safety code, alarming, data archiving, and Operator Interface configuration were all done by local engineers after a one week training course at RTP Corporation.

The second ease of use issue was during operation. Due to the extensive diagnostic capability of the RTP controller, the plain text fault diagnostic messages, and the use of Cyrillic characters on the screens on the Operator's stations and Engineering Workstation, faults are easily identified and technicians can be directed to the cause of



the fault reducing repair time and allowing for ease of maintenance.

Conclusion

RTP provides the most highly integrated DCS and SIS available today. Software skills and hardware components are interchangeable between the DCS and the SIS. Whether one system is used for both functions or the functions are divided between two systems, users will find lower cost associated with using RTP over other systems.

About RTP

Founded in 1968, RTP Corp. is a developer and manufacturer of high-performance critical control and safety systems. Markets for RTP Corporation's products include process control and safety systems, and nuclear power plant systems. RTP offers a wide range of rugged hardware and a complete suite of software for industrial control solutions that include seamlessly redundant and triplicated systems for mission-critical applications.