

JSC «Gazpromneft – ONPZ»

Information about the object:

Isomalk-2 of JSC «Gazpromneft – ONPZ»

Light gasoline tops isomerization plant is dedicated to convert light gasoline tops into blending fuel with the help of low temperature isomerization processing. Raw of the reaction section is mixed with hydrogen-bearing gas injected by circular compressor – CC-1 with non-stop operation.

Compressor is rotated by induction motor type AMi 560K4ABSFPH made by ABB Company. Watt-hour consumption – 3420 kW, rated voltage – 3.3 kV, maximum rotation speed – 1500 rpm.

Description of the customer's enterprise:

«Gazpromneft – Omskiy ONPZ» is subsidiary enterprise of «Gazpromneft». It is one of the most advanced oil refineries in Russia and one of the biggest in the world.

In 2003 Omskiy NPZ «Gazpromneft» increased production of blending fuel up to 2.5%. Production of diesel fuel has been increased up to 10.8%, up to 6.3 mil of tons and more than 60% of it is considered to be Euro-5 standard. Oil refining efficiency has increased up to 91.03%. This is one of the best indexes in the industry. The main operating procedures of JSC «Gazpromneft – Omskiy ONPZ» are the following: desalting of oil,

dehydration of oil, primary crude oil processing, eat cracking, sulfuric acid alkylation, catalytic reforming, diesel fuel hydrotreater, production of benzene hydrocarbons and others.

The enterprise produces about 50 types of oil products: gasoline, diesel and jet propulsion fuel, city gas, heating oil, benzene, toluene, orthoxylene, paraxylene, bitumen, coke, commercial sulphur and other hot products. Omskiy oil refinery is the only Russian producer of eat cracking.





Problem:

In process of design and construction circular compressor – CC-1 was equipped by high voltage frequency converter (HVFC) ACS1013-W2 with liquid cooling, 3.42 mW power and electric potential 3300 V made by ABB Company. In operation emergency shutdown took place due to the leakage of deionized water in the inner circuit of cooling system of HVFC, also due to the problems with the supply of cooling water to the inner circuit. Idle time losses caused by emergency shutdowns were so big that the management of the plant took decision to change the convector into the one with air cooling.

Now technical re-equipment of Isomalk-2 compressor CC-1 is presupposed with the replacement of the existing high voltage frequency converter (HVFC) ACS1013-W2 with liquid cooling made by ABB Company by high voltage frequency converter PowerFlex 7000 with air cooling complete with input and by-pass cells produced by Rockwell Automation Company. Also the existing transformer KTPM 7 HM 4900 is presupposed to be replaced with a type GDGN 5000/7.2 – spez. dry three-phase transformer lined by resin.

Activities:

The below mentioned activities have been performed according to the project:

- the transformer KTPM 7 HM4900 has been removed from the transformer house;
- the new transformer GDGN 5000/7.2 – spez. has been installed, installation and bonding of dry three-phase transformer was performed according to the data in the type plate with the electrical drawings and on the basis of the provided data;
- the frequency converter ACS1000 was dismantled;
- instead of dismantled frequency converter input section 1512DM and by-pass section 1512M of PowerFlex 7000 were installed;



Frequency converter PowerFlex7000 with air cooling made by Rockwell Automation Company consists of the following cabinets:

1. 1512DM – inlet contactor section and outlet disconnect switch
2. Pf7000 – frequency converter PowerFlex7000 for the engine with electric potential 3300 V and current of voltage up to 720A.
3. 1512M – input and by-pass contactors section
4. 1508T – power reducing transformer with 5000 kVA power and with the rated voltage 6.0/3.3 kV



Additional reason to choose this frequency converter was the necessity to provide continuous unit operation for 4 year period of time.

In order to have such opportunity “BPA” Company together with Rockwell Automation Company offered bumpless switching of the engine of the compressor to line supply in order to arrange maintenance check of the transformer without any stops in compressor operation. In preparation to the procedure of bumpless switching it was taken into account that PowerFlex 7000 frequency converter with air cooling and with input and by-pass cells take much more space in comparison to the previous frequency converter with water cooling and without cells. That is why additional space was prepared in order to install new equipment and for embrasure in the wall of the sub-station to install new frequency converter, to make special metal constructions for input and by-pass sections.

It was necessary not only to install new equipment but also to solve the problem with heat removal generated by the new frequency converter. 6 trench conditioners up to 14 kW were installed to solve this problem. They were installed in such way so they can inhaust hot air above the new frequency converter and fan the cooled air to the grills of the frequency converter air filters.

Terms of project execution:

The work was performed within a short period of time due to good teamwork of “BPA” Company and Rockwell Automation Company staff. The works were finished 2 days earlier than it was planned. Construction and installation work were completed within 12 days.



Start-up and adjustment work, including by-pass switch check were performed within 8 days by Rockwell Automation staff with the help of «BPA» Company.

Careful scheduling and every day control as well as control of activities by the personnel of the customer are necessary to be mentioned.

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Additional information can be received at the below mentioned links

<http://www.bpa.ru/>

<http://www.rockwellautomation.com/rus/overview.page>

<http://onpz.gazprom-neft.ru/>

www.bpa.ru

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