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RELY ON EXCELLENCE

Preventing energy from evaporating into thin air

EagleBurgmann supplies high temperature-resistant fabric expansion joints for HRSGs

Gas turbines are used to generate power for production plants with high energy demand. They allow for quick start-ups and flexible adjustment of the power output. One of the downsides of gas turbines can be their energy efficiency: with their exhaust gases they release a lot of unused heat energy into the atmosphere. The Indian company Thermax supports operators in using resources more efficiently, thereby reducing costs and environmental impact. For example, Thermax manufactures heat recovery steam generators (HRSGs) that extract energy from turbine exhaust gases and increase turbine efficiency. Fabric expansion joints are crucial components in HRSGs and have to withstand temperatures of up to 600 °C. When selecting suppliers for an important export project at a petrochemical plant in Nigeria, Thermax did not want to take any risks – and went for tried and tested expansion joint solutions from EagleBurgmann.

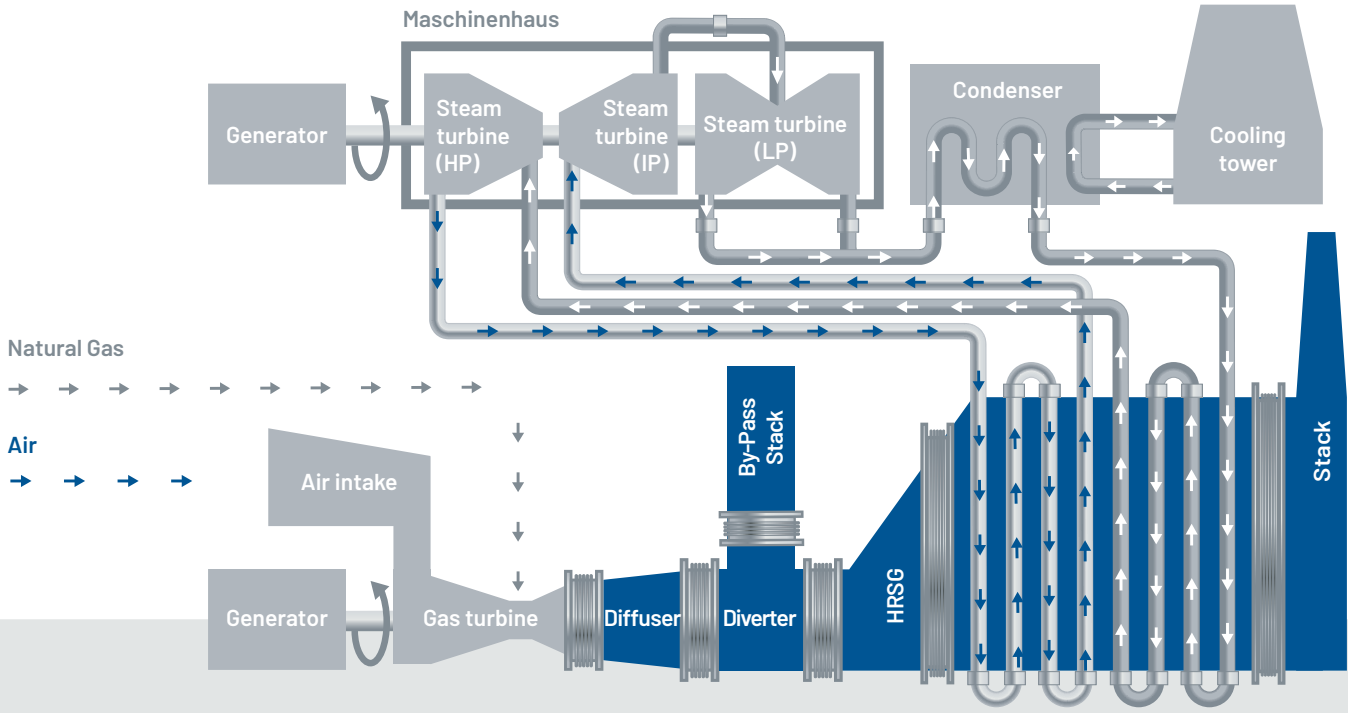
HRSGs allow for higher energy output and lower resource input

Indorama Eleme Petrochemicals Limited is a Nigerian manufacturer of plastic goods like low-density polyethylene (LDPE) and high-density polyethylene (HDPE). In 2020, they decided to engage Thermax to retrofit the gas turbines at their production plant with HRSGs, so that they would work more efficiently and require less fuel. The hot turbine exhaust gases that power the HRSGs lead to thermal expansion in the duct system. To compensate this, Thermax required fabric expansion joints that can permanently withstand high temperatures.

In case an expansion joint in an HRSG fails, replacing it often means shutting down the entire gas turbine. Therefore, operators rely on fabric expansion joints which offer a long service life despite of high temperature and pressure loads.

Applications ranging from plastic bags to 3D printers

The polyethylenes that are produced in petrochemical plants play an important role in our everyday lives. Distinctions between different kinds of polyethylenes can be made on a molecular level. In contrast to high-density polyethylene (HDPE), which only shows minimal branching, the molecular chains of low-density polyethylene (LDPE) are strongly branched. This results in materials with different properties that can be used in different applications. LDPE is light, flexible and therefore ideal for plastic bags and packaging. HDPE on the other hand is more rigid and heat-resistant. It is used in toys, plastic chairs and other products where longevity is key. More recently, HDPE is also becoming popular as filament for 3D printing.



Gas turbine exhaust gases can become as hot as 600 °C. Instead of discharging the gases into the atmosphere, they can be used to generate electric power with the help of HRSGs. Here, heat energy is extracted from the exhaust gases to power a steam generator and generate electricity. This way, more energy can be extracted from natural resources, resulting in increased resource productivity, cost savings and a reduced environmental footprint. The HRSGs deployed at Indorama Eleme Petrochemicals are equipped with fabric expansion joints at every segment after the diffusor: At the damper inlet, damper outlet, bypass stack, HRSG inlet, HRSG outlet and stack inlet.

A fabric expansion joint from EagleBurgmann in a similar application in India.

A prestigious project demands for a trusted supplier

Export projects of this scale are of upmost importance for OEMs like Thermax. "On such a prestigious project, OEMs choose their partners very carefully", says Vijaykumar Daniel, senior sales director at EagleBurgmann. "They must rely on a high standard of quality as well as on-time delivery." EagleBurgmann and Thermax had already worked together successfully in previous projects around the globe and had established a trustful relationship. Due to their long-time beneficial business partnership, EagleBurgmann was certified as a preferred supplier for Thermax. This status saves time and money when processing new orders. All these factors played into Thermax' decision to order 26 fabric expansion joints for their project in Nigeria from EagleBurgmann.

A global partner for global projects

When working on transnational projects, EagleBurgmann's expertise as an internationally established company takes effect. EagleBurgmann has collected experience with projects around the globe and is locally present with service teams in every part of the world. "Wherever our customers are, we are as well. In case of a malfunction, we can immediately send technicians and reduce downtime to a minimum", says Shankar Gopalan, business development manager at EagleBurgmann.

Ensuring flexibility and high customer focus even in pandemic situation

Due to the corona situation, this project took place under less than favorable conditions. For example, travel restrictions did not allow for on-site visits at the customer.

To nevertheless ensure the high customer focus and flexibility that EagleBurgmann's partners are accustomed to, workflow and communication processes were adapted accordingly. All product requirements and necessary modifications, for example regarding the steel frame design or choice of fabric layers, were discussed via telephone or in online meetings. "To some extent, being dependent on these digital tools even improved the efficiency of our communication", says Daniel. "Instead of coordinating with various contacts individually, we brought together all relevant persons in one single forum and clarified all open questions at once."
Apart from supporting Thermax in technical issues, EagleBurgmann provided assistance in preparing the quotation for the end customer. "We were able to prove to Thermax that even in these challenging times we're up to the task", says Daniel.

Heat-resistant components for a save working environment

Expansion joints are integral components of HRSGs and installed at critical locations in the system. They compensate for expansions in the duct system that occur due to changes in temperature, pressure or media. The expansion joints must permanently withstand temperatures of 600 °C as well as isolate the heat within the system. "The outside of the fabric should not exceed temperatures of 80 to 100 °C", explains Gopalan. "At any given time, operating personnel must be able to work around the expansion joints without being exposed to substantial thermal radiation. Gas leakages must be prevented under any circumstances." Decade-long experience in a wide range of projects helped EagleBurgmann gain deep material expertise that ultimately benefits their customers in every cooperation. EagleBurgmann consults customers on material selection and guarantees to deliver a product that is custom-fit for the specific requirements. In this HRSG application, a Thermoflex fabric that was modified with additional layers turned out to be the optimal solution to withstand the challenging operating conditions.

The expansion joints are key components of the HRSGs, replacing them takes considerable effort.

Durable solutions at a very competitive price

„We've been working closely with EagleBurgmann on various projects for years and thus we are confident that even when pressure is high, they will not compromise on the quality of their expansion joints", says Girish Jamdar, senior manager procurement at Thermax. "EagleBurgmann's products allow us to supply our customers with reliable, durable solutions – even when price is a factor. In a highly competitive market environment, this is a decisive advantage for us."

Regarding the durability of their expansion joints, EagleBurgmann can rely on a wealth of experience and provide references that speak for themselves. "In comparable applications, a fabric expansion joint is expected to last at least four to five years", explains Shankar Gopalan. "However, in 2001 we've installed an expansion joint for a HRSG that is still in service today. That shows us that when you do things properly, a longer service life is attainable."

EagleBurgmann – at the leading edge of industrial sealing technology

Our products are used wherever safety and reliability count: in the industries of oil & gas, refineries, petrochemicals, chemicals, pharmaceuticals, food, power, water and many more. About 6,000 employees contribute their ideas, solutions and dedication every day to ensure that customers around the globe can rely on our seals. With our modular TotalSealCare Service, we emphasize our strong customer orientation and offer custom-tailored services for every need. **Rely on excellence.**

eagleburgmann.com
info@eagleburgmann.com