



Turbo Expo

Turbomachinery Technical Conference & Exposition

ASME IGTI *Oil & Gas Committee* Tutorial of Basics Webinar Oil and Gas Applications for Turbomachinery

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Abstract

This tutorial explains the applications for turbomachines in the oil and gas industry. Upstream, mid-stream and downstream applications in the oil and gas industry, and application requirements are explained. Typical applications include pipeline compression, gas plant compression, gas lift, gas gathering, gas export, flash gas, gas storage, compressors for refrigeration and LNG processes, and refinery applications. We explain requirements imposed on turbomachinery by the specific applications in the oil and gas industry. After a quick overview of the function of turbomachinery, we will explain the applications, grouped into upstream, mid-stream and downstream tasks.

In these applications, compressors are driven by gas turbines, steam turbines, expanders, constant speed and variable speed electric motors. Specific requirements for applications offshore are discussed.

We will also discuss specific requirements into the capability to use opportunity fuels, the requirements from packaging the equipment based on the severity of the environment, and concepts of process control for the machines.

Gas turbines, steam turbines, gas compressors, their components and support systems, as well as their relevant performance characteristics are explained. The discussion includes the basics of turbomachinery performance, using both aero dynamic and thermo dynamic principles to derive the performance at varying operating conditions. The different operating conditions are due to changes in ambient conditions, but also due to process changes, including changes in process gas compositions, pressures, temperatures, and flows.

We will further cover Natural Gas as bridge fuel to more sustainable world, and its transitioning into a commodity with the wide use of LNG. This tutorial explains the industry and where it is going. A part of the tutorial is given to a discussion on the future of oil and gas applications, especially in the light of the use of renewables in power generation, and possibly in transport applications.