



Gas Turbine Power Plants

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Combustion Chamber

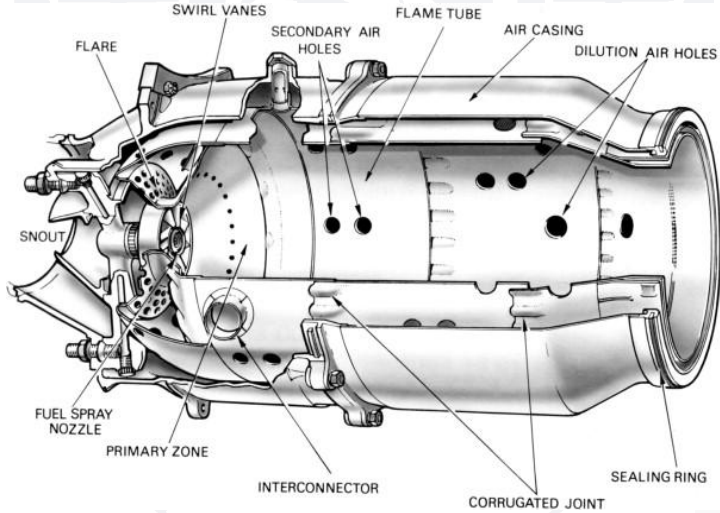


Figure 2. Combustion Chamber. ^[2]

- **Function:**
The combustion chamber is the area inside the engine where the fuel/air mixture is compressed and then ignited.

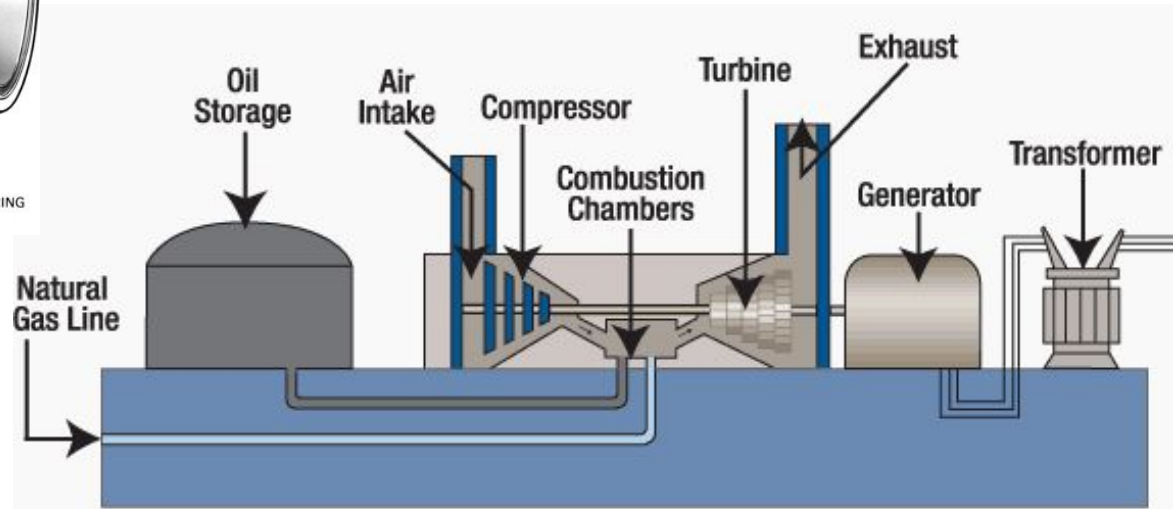


Figure 1. Gas (combustion) turbine power plant. ^[1]

Current Problems

- Low efficiency:
 - 40-45% of fuel energy is converted into a useful work.^[3]
 - Remaining fuel energy in form of heat losses is transferred to environment.
 - One possible solution to decrease heat losses from the engine is by insulation of combustion.
 - Plan: Study the application of thermal barrier coating (TBC) on combustion chamber as a major method to reduce the heat loss, and design a system with an improved efficiency.

Project Prospects (Method: TBC)

Goal Parameter	Efficiency
Current Efficiency	40-45% ^[3]
Target Efficiency	Increased by at least 3%
Design Variable(s) to be Manipulated in this Project to Attain Target	Coating material ^[4] (Thermal conductivity), Coating thickness ^[5]
Constraint	Operating temperature > 870 °C ^[6]

References

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