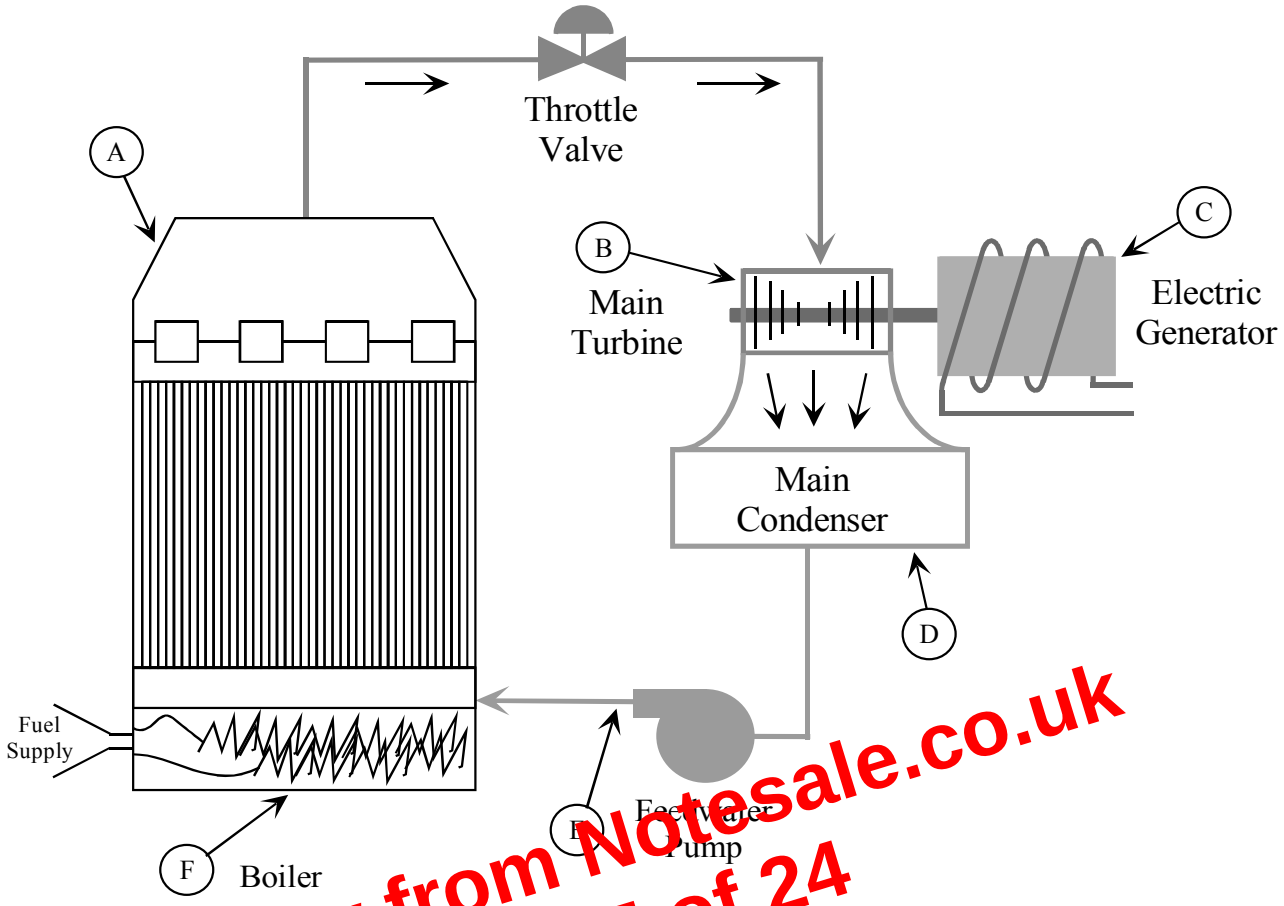
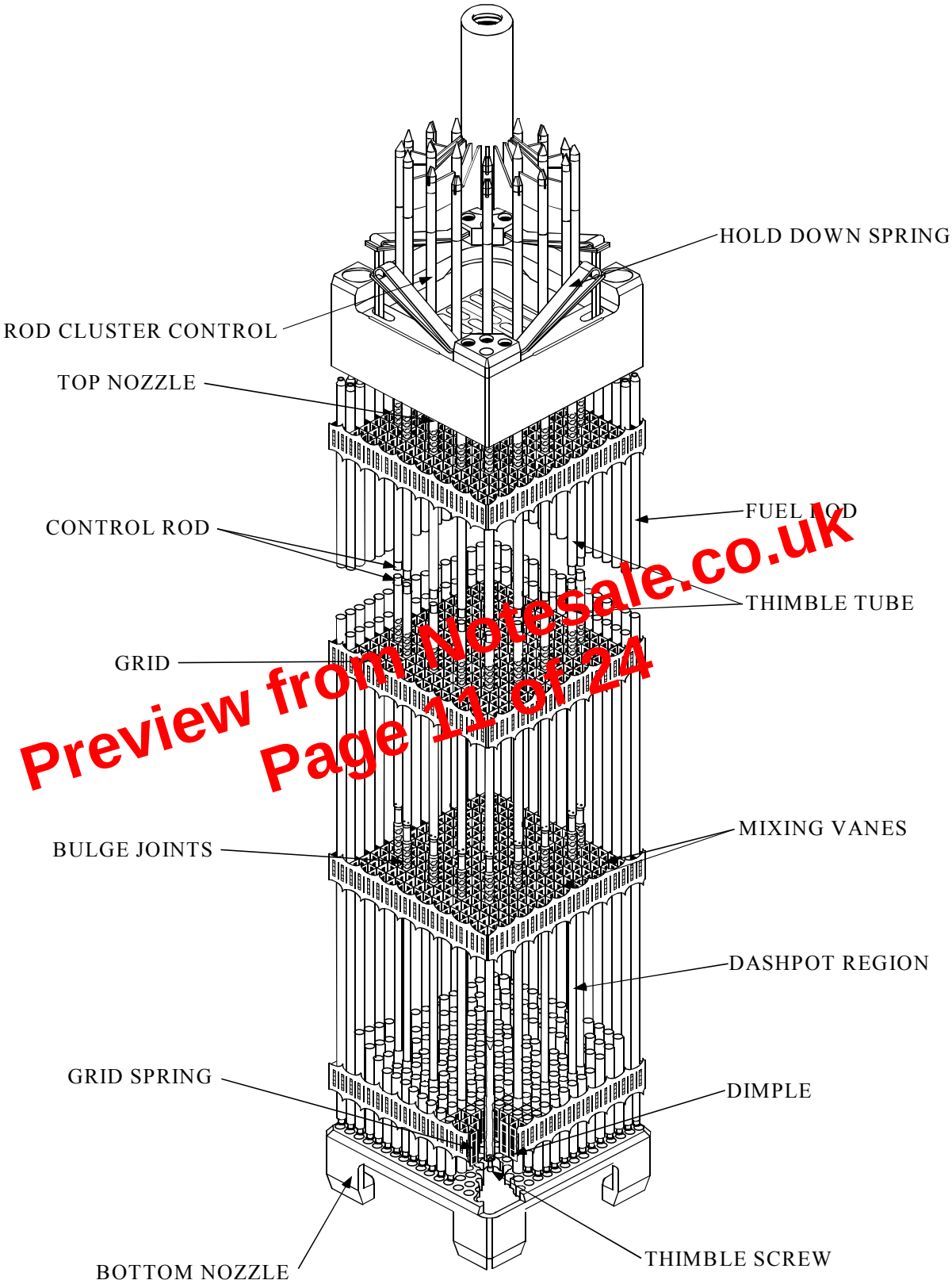
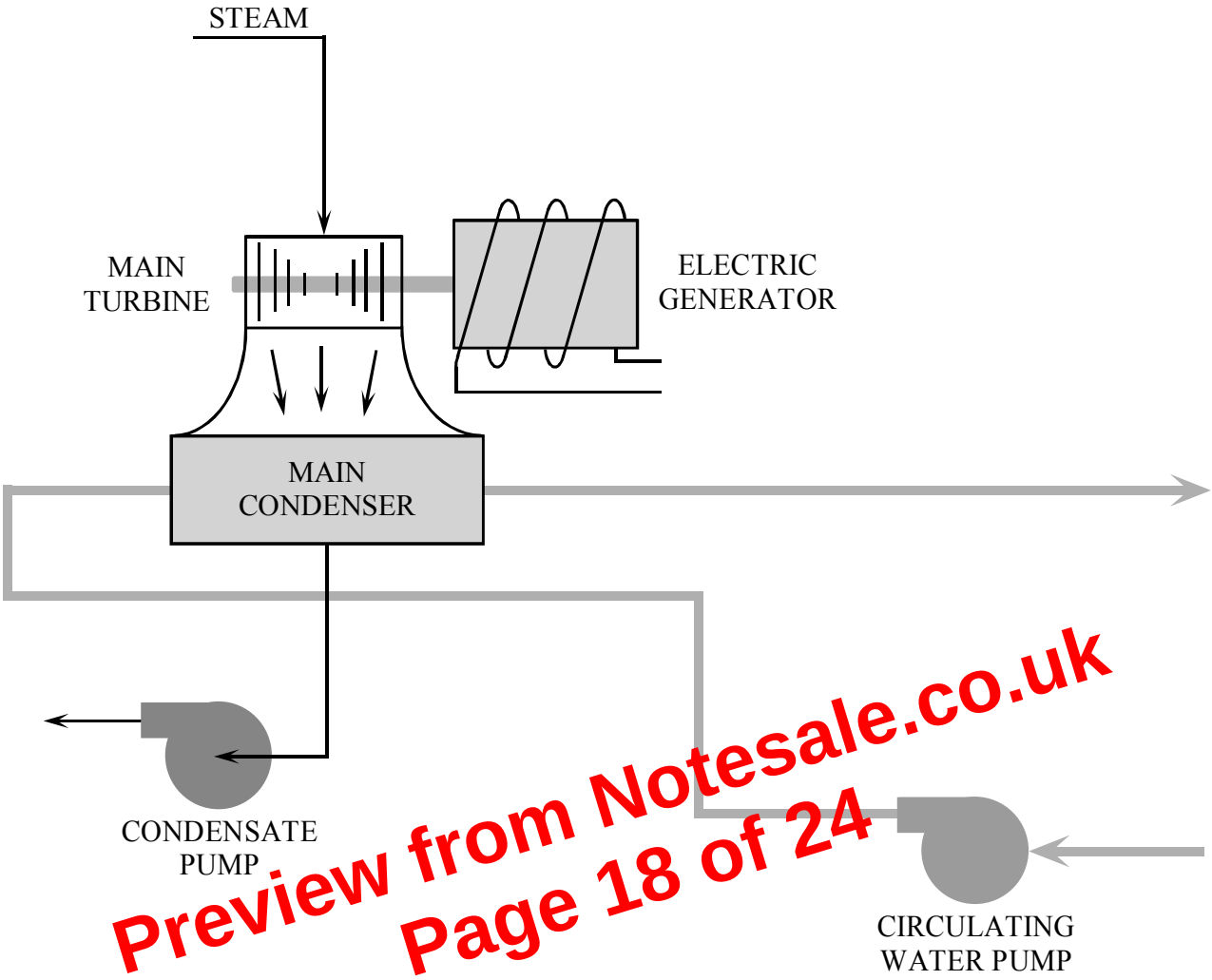


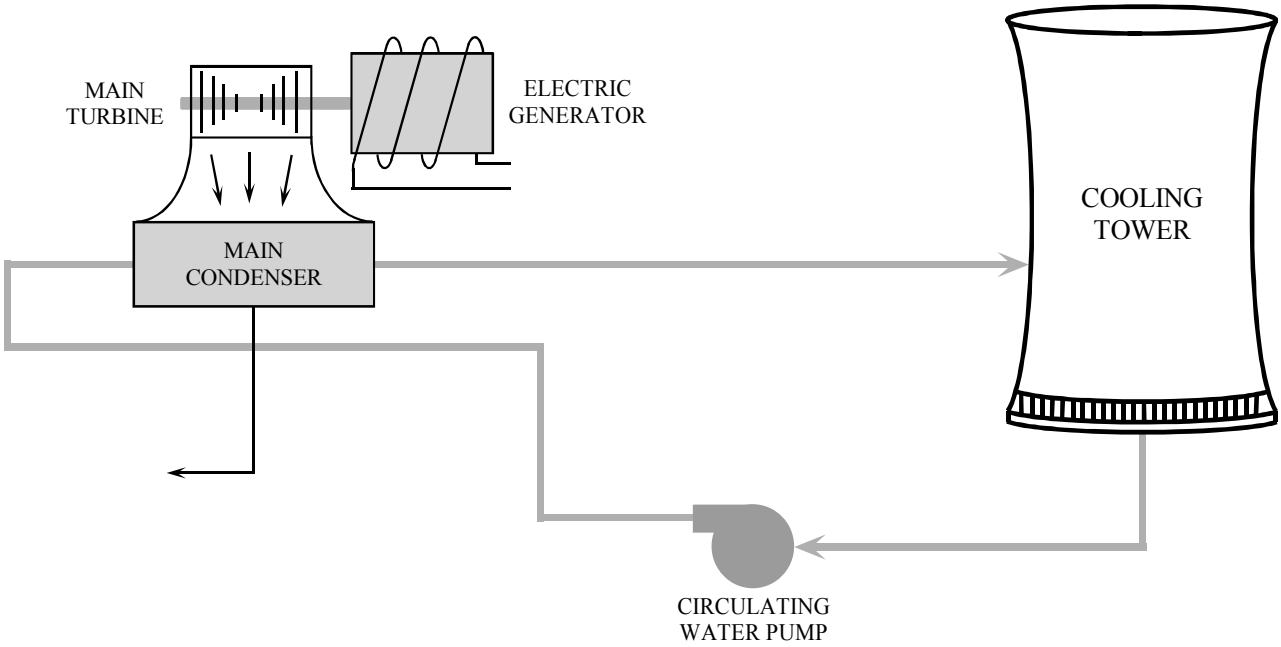
FOSSIL FUEL STEAM PLANT

In a fossil-fueled power plant, heat, from the burning of coal, oil, or natural gas, converts (boils) water into steam (A), which is piped to the turbine (B). In the turbine, the steam passes through the blades, which spins the electrical generator (C), resulting in a flow of electricity. After leaving the turbine, the steam is converted (condensed) back into water in the condenser (D). The water is then pumped (E) back to the boiler (F) to be reheated and converted back into steam.





To operate properly, all steam plants, whether nuclear or fossil-fueled, need a circulating water system to remove excess heat from the steam system in order to condense the steam, and transfer that heat to the environment. The circulating water system pumps water from the environment (river, lake, ocean) through thousands of metal tubes in the plant's condenser. Steam exiting the plant's turbine is very rapidly cooled and condensed into water when it comes in contact with the much cooler tubes. Since the tubes provide a barrier between the steam and the environment, there is no physical contact between the plant's steam and the cooling water. Because a condenser operates at a vacuum, any tube leakage in this system will produce an "inflow" of water into the condenser rather than an "outflow" of water to the environment.



The taller hourglass shaped, natural convection cooling towers do not require fans to transfer the excess heat from the circulating water system into the air. Rather, the natural tendency of hot air to rise removes the excess heat as the circulating water splashes down inside the cooling tower. These towers are typically several hundred feet tall.