

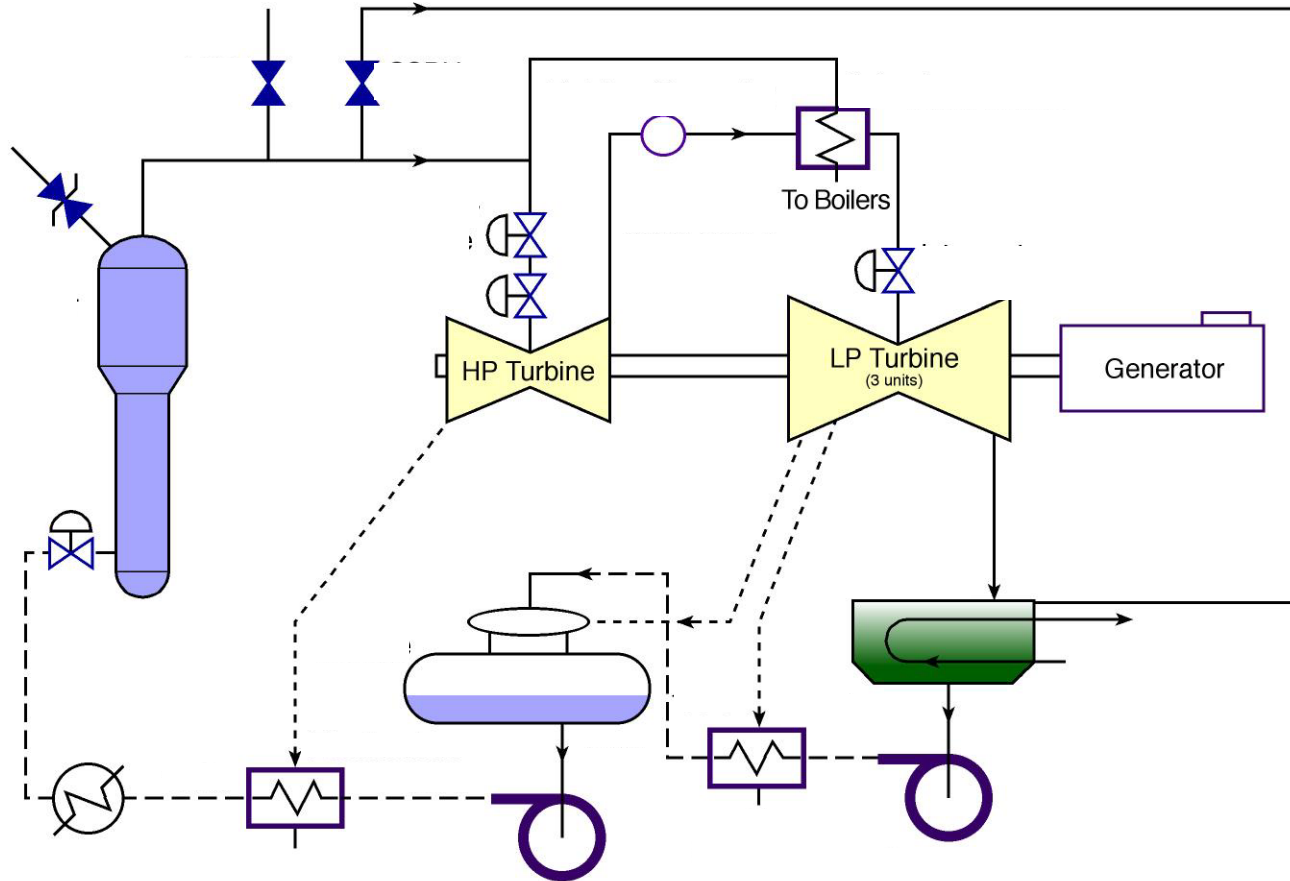
# The Conventional Side



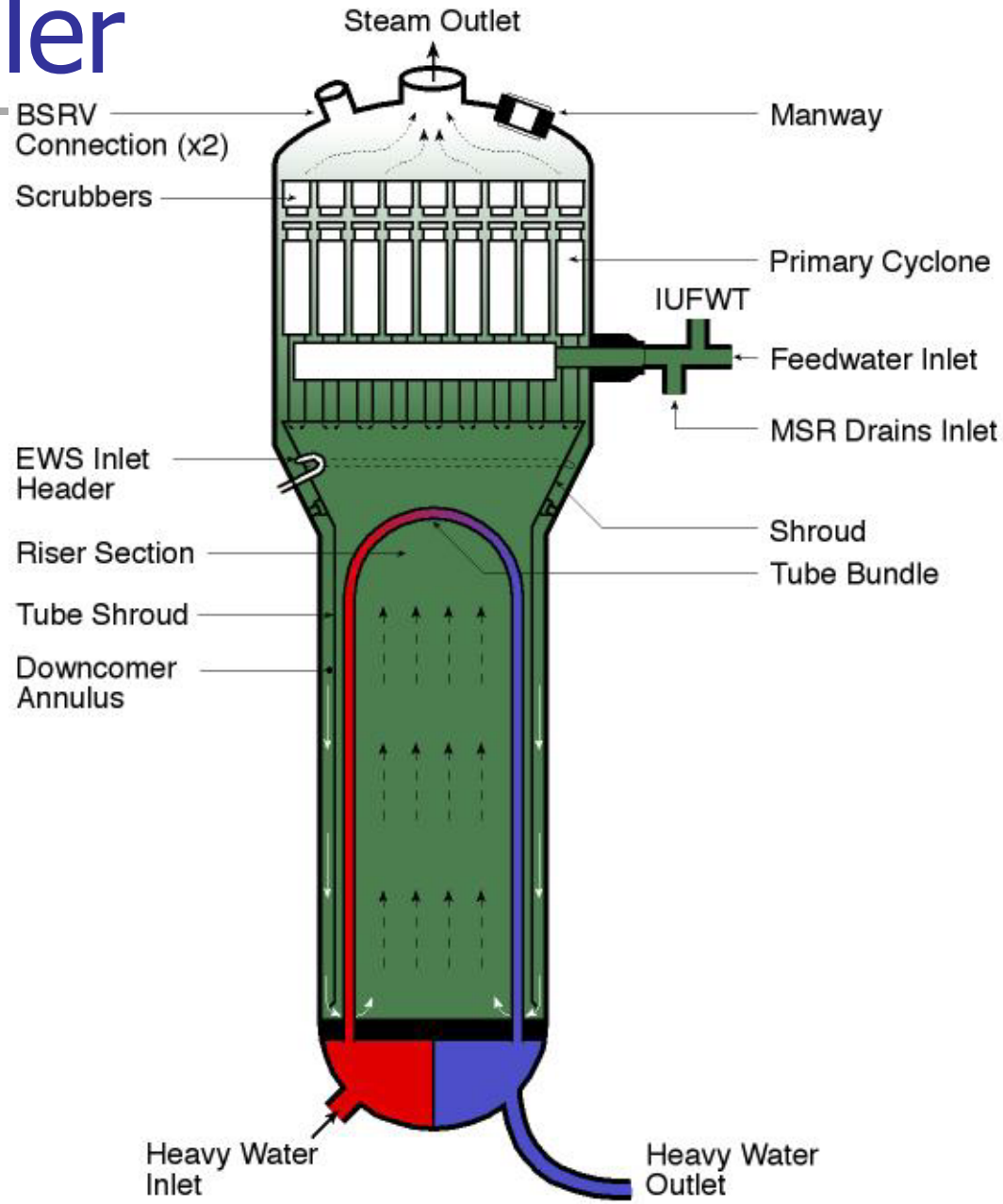
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19 February 2004

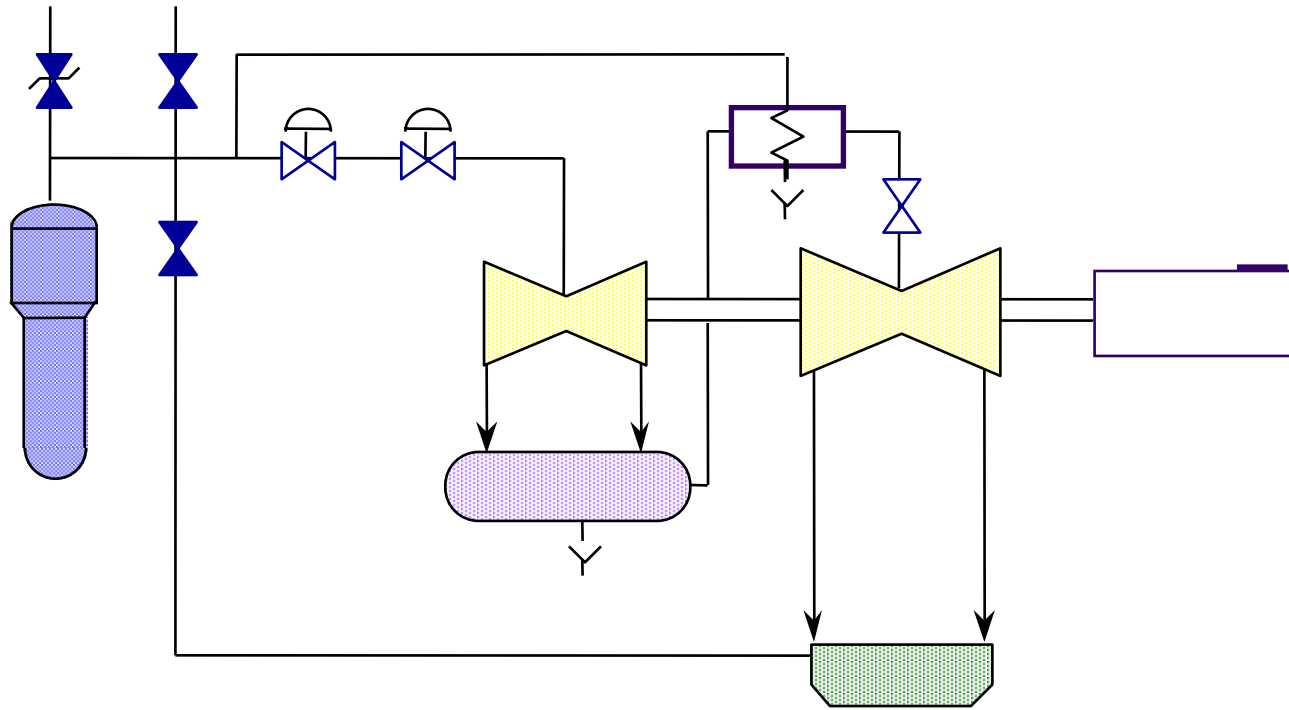
# Steam & Feedwater Cycle



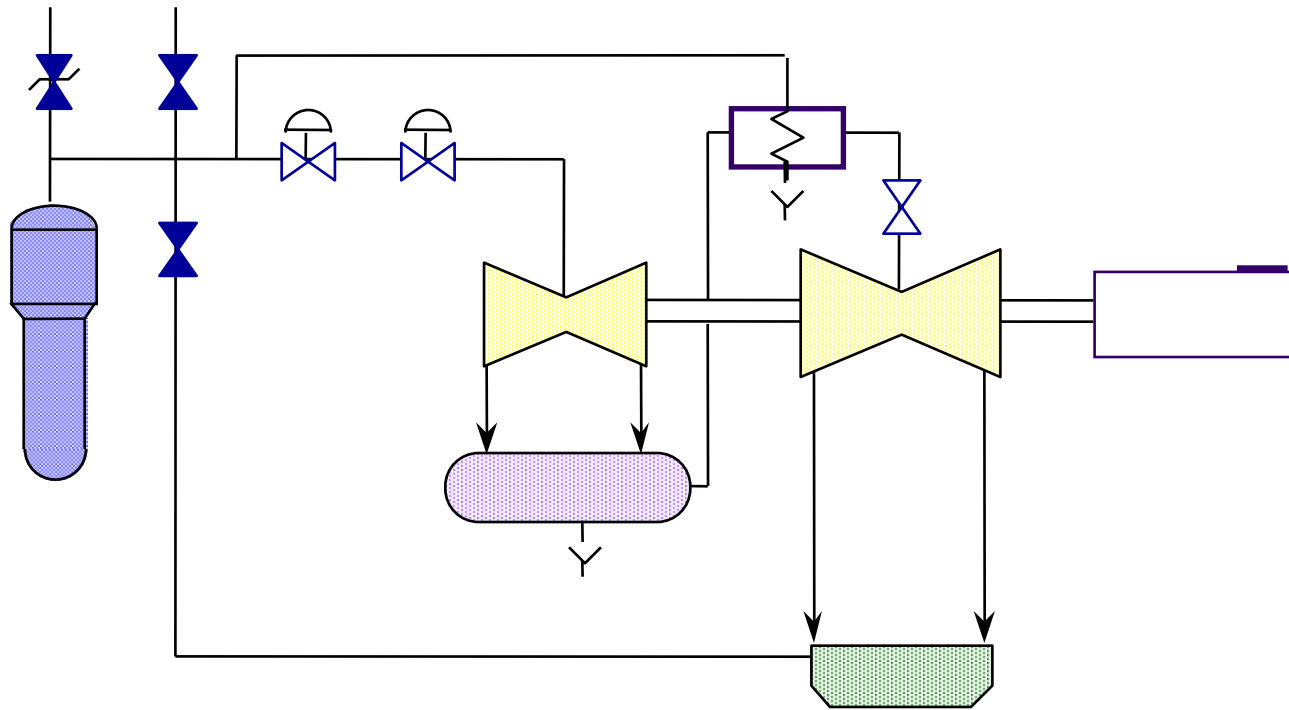
# Bruce B Boiler



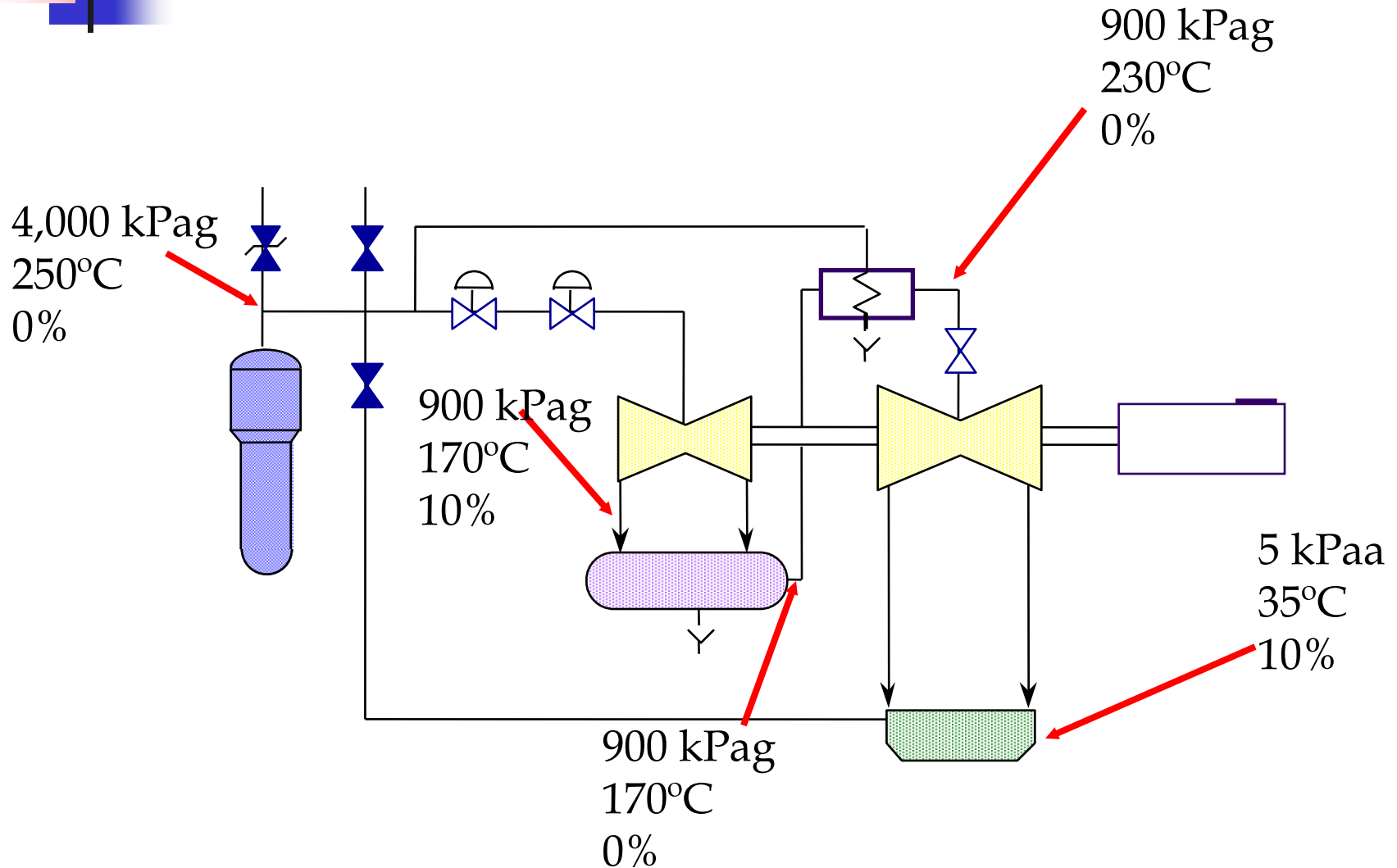
# Major Pieces



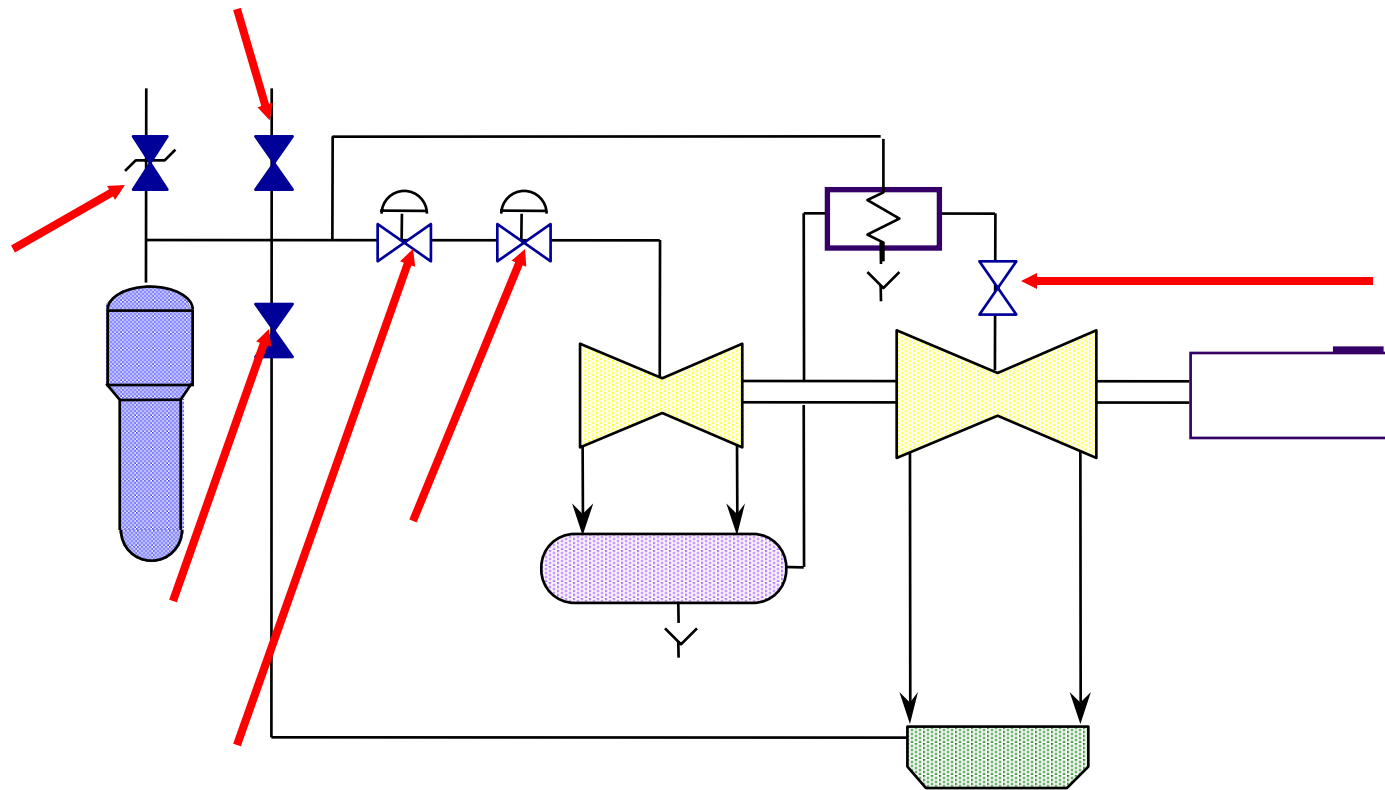
# Steam Valves



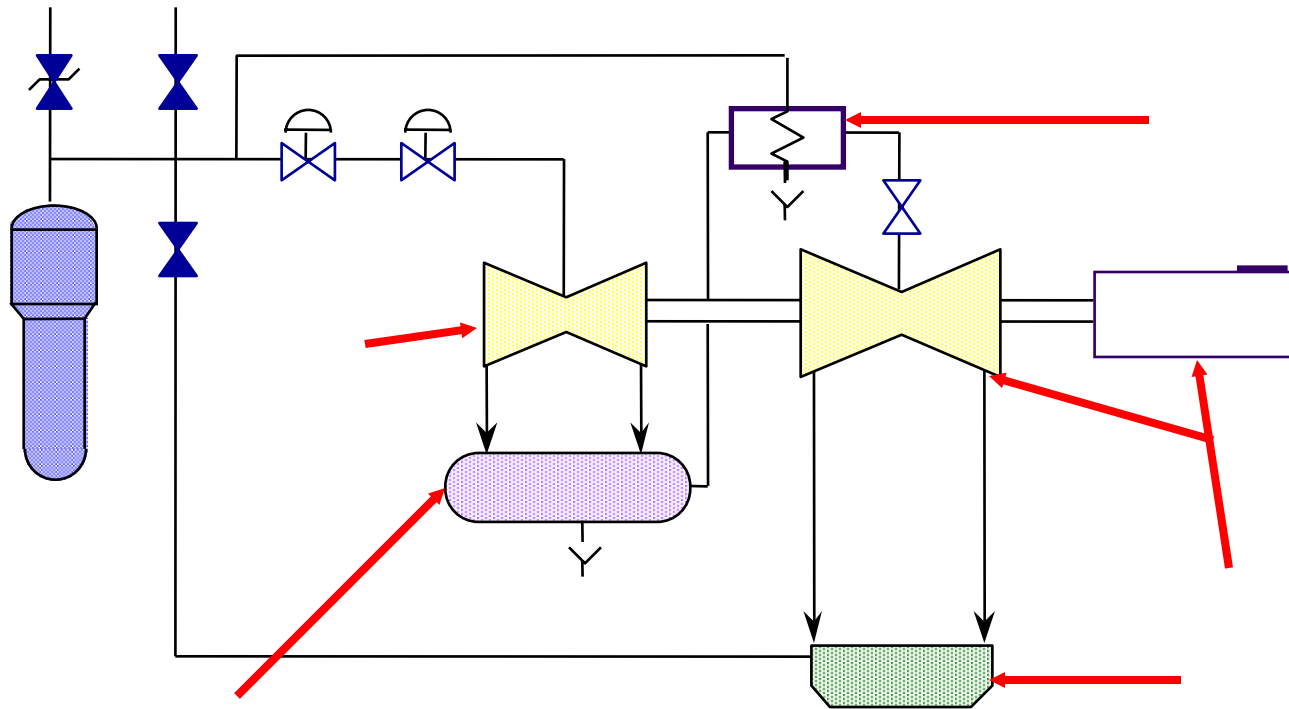
# Temperatures, Pressures and Moisture



# Name That Valve

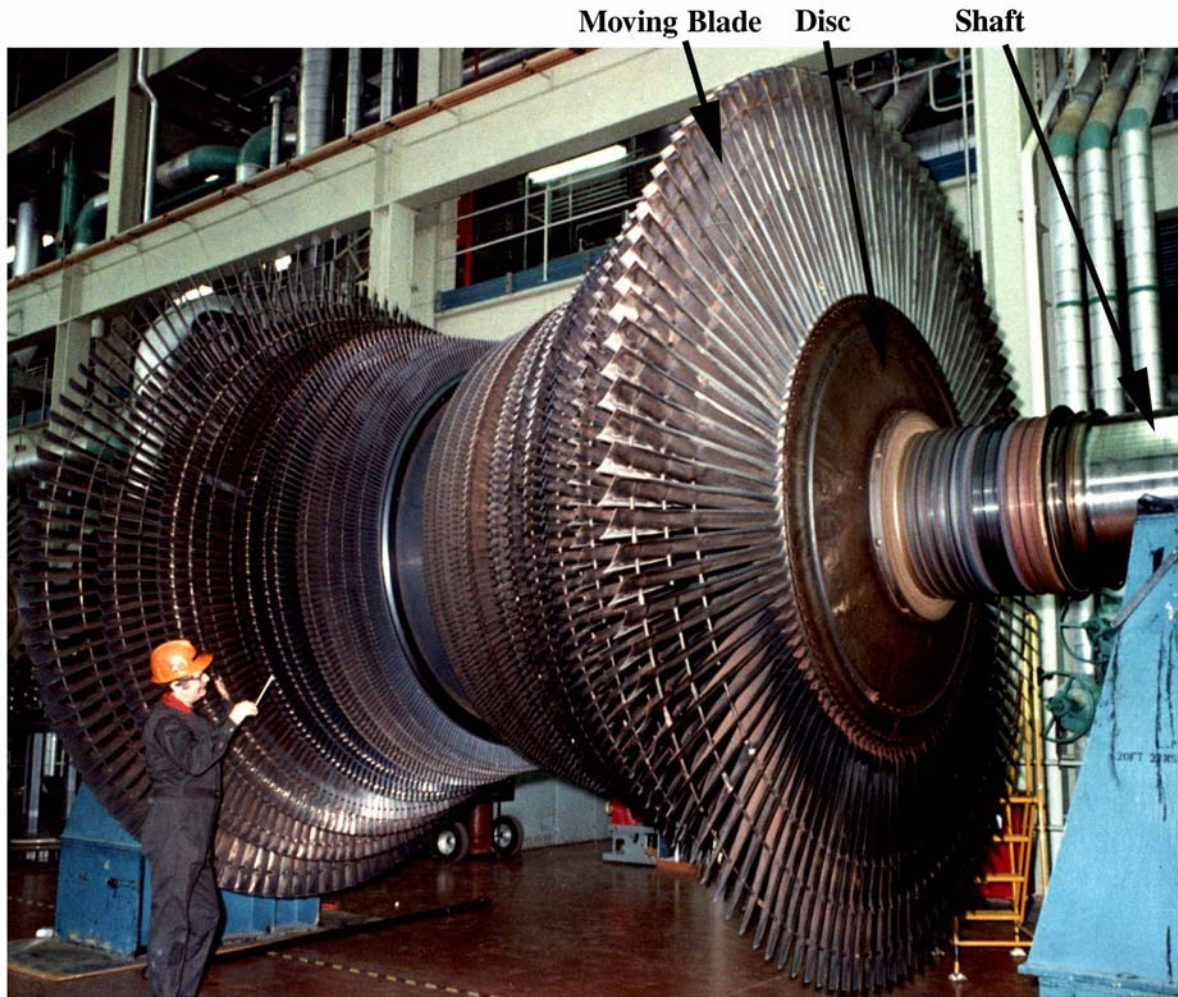


# Name That Part





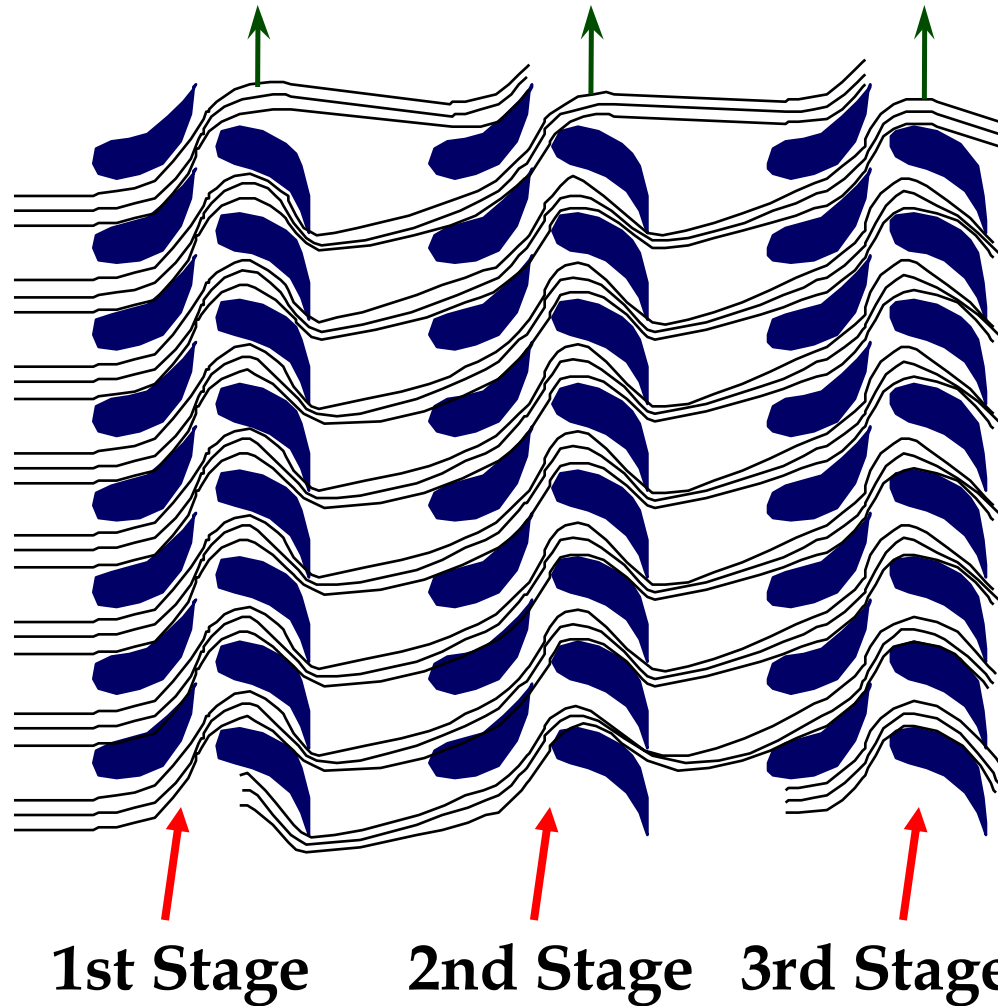
# Turbine Moving Blades



# HP & LP turbines



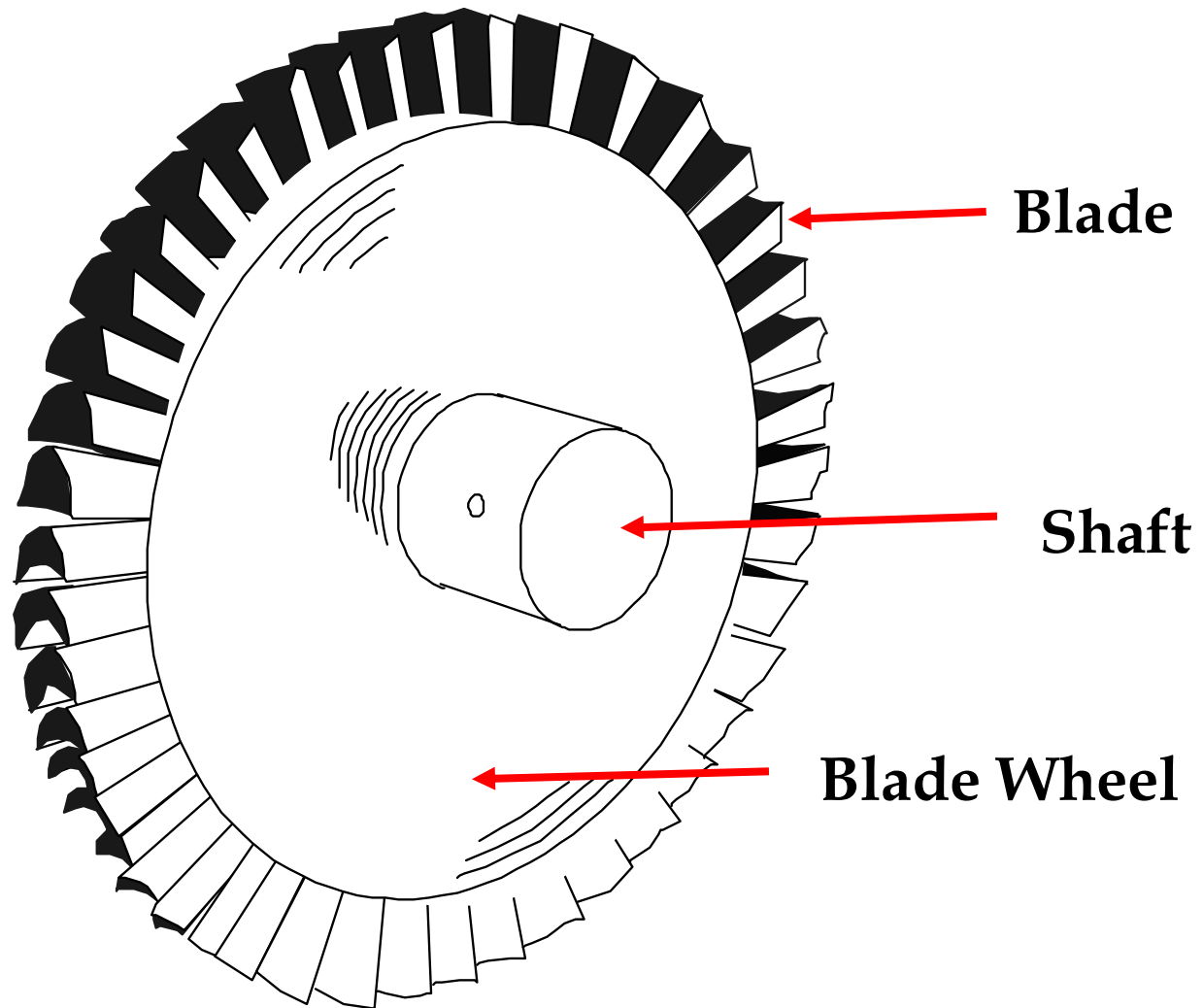
# Fixed and Moving Blades Arrangement



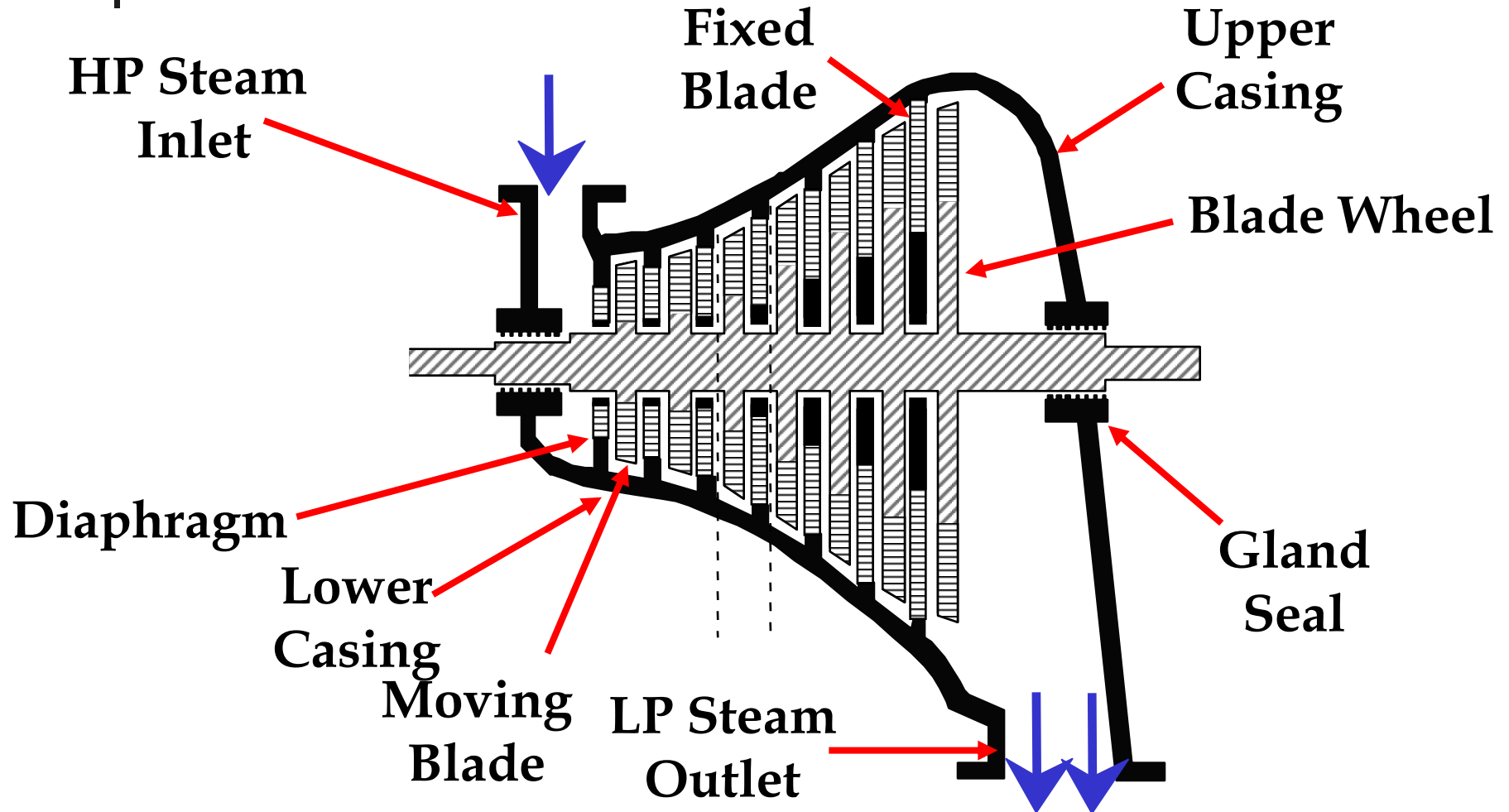


# Turbine Moving Blades

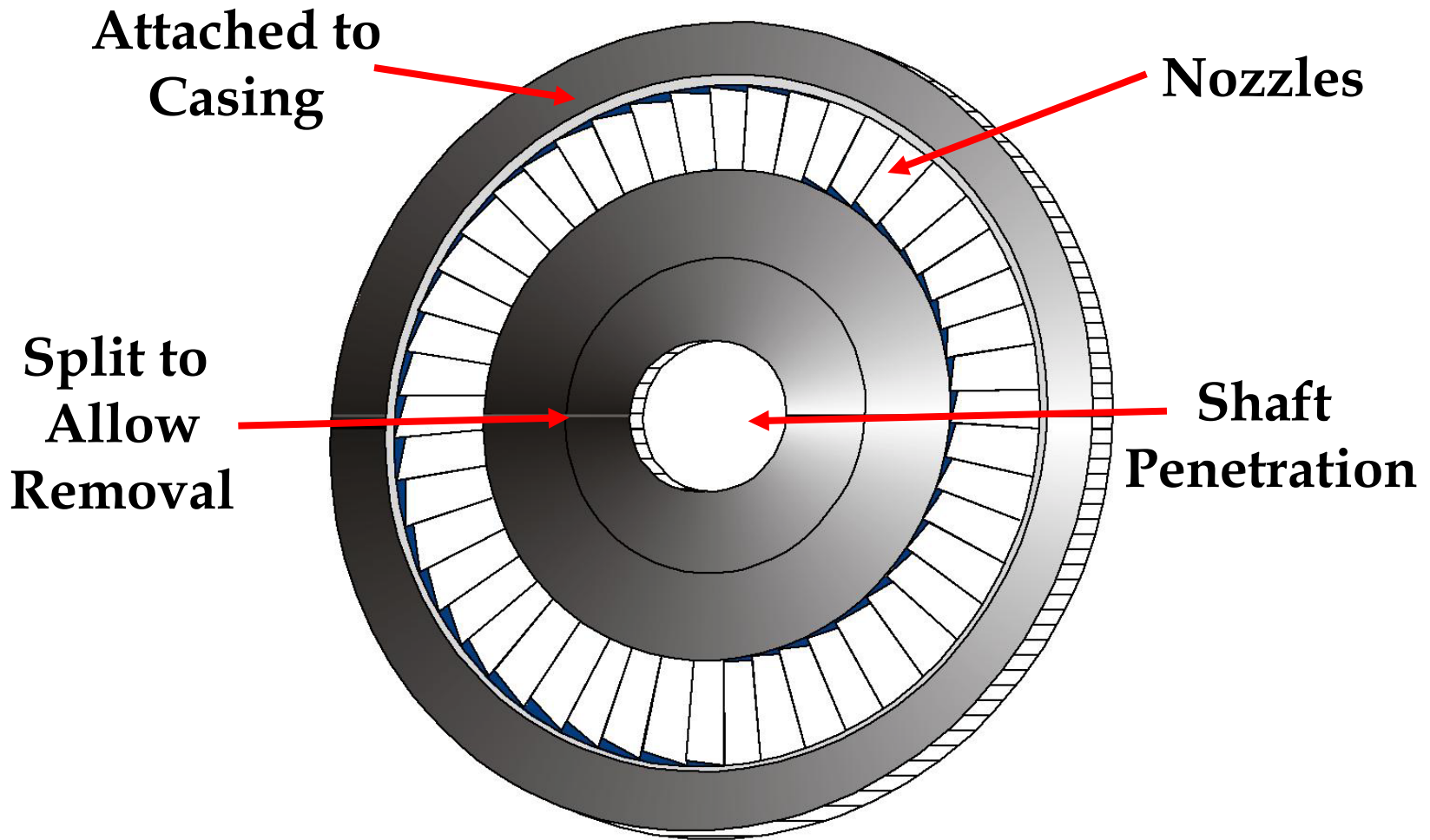
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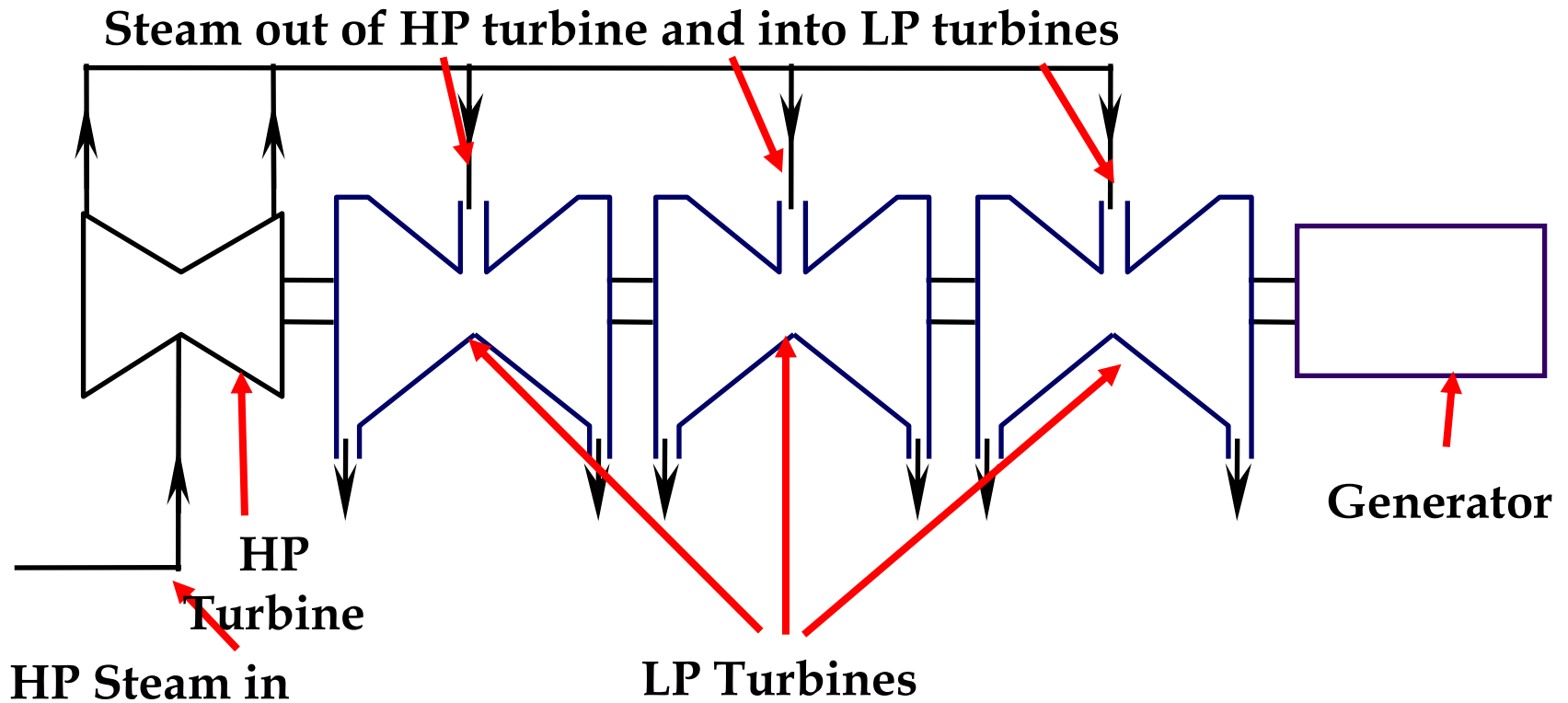
# Turbine Section View



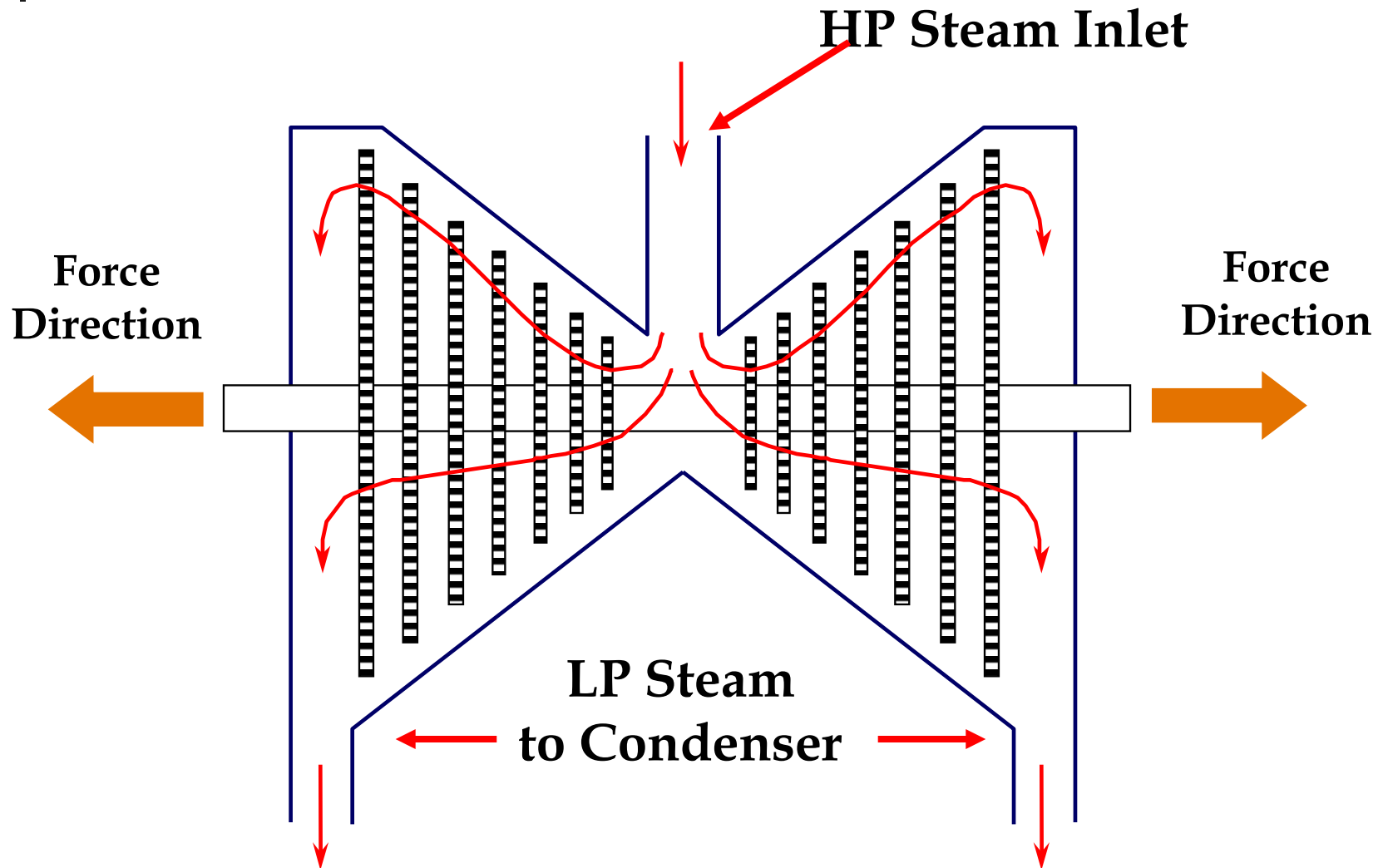
# Turbine Diaphragm



# Typical Turbine Layout

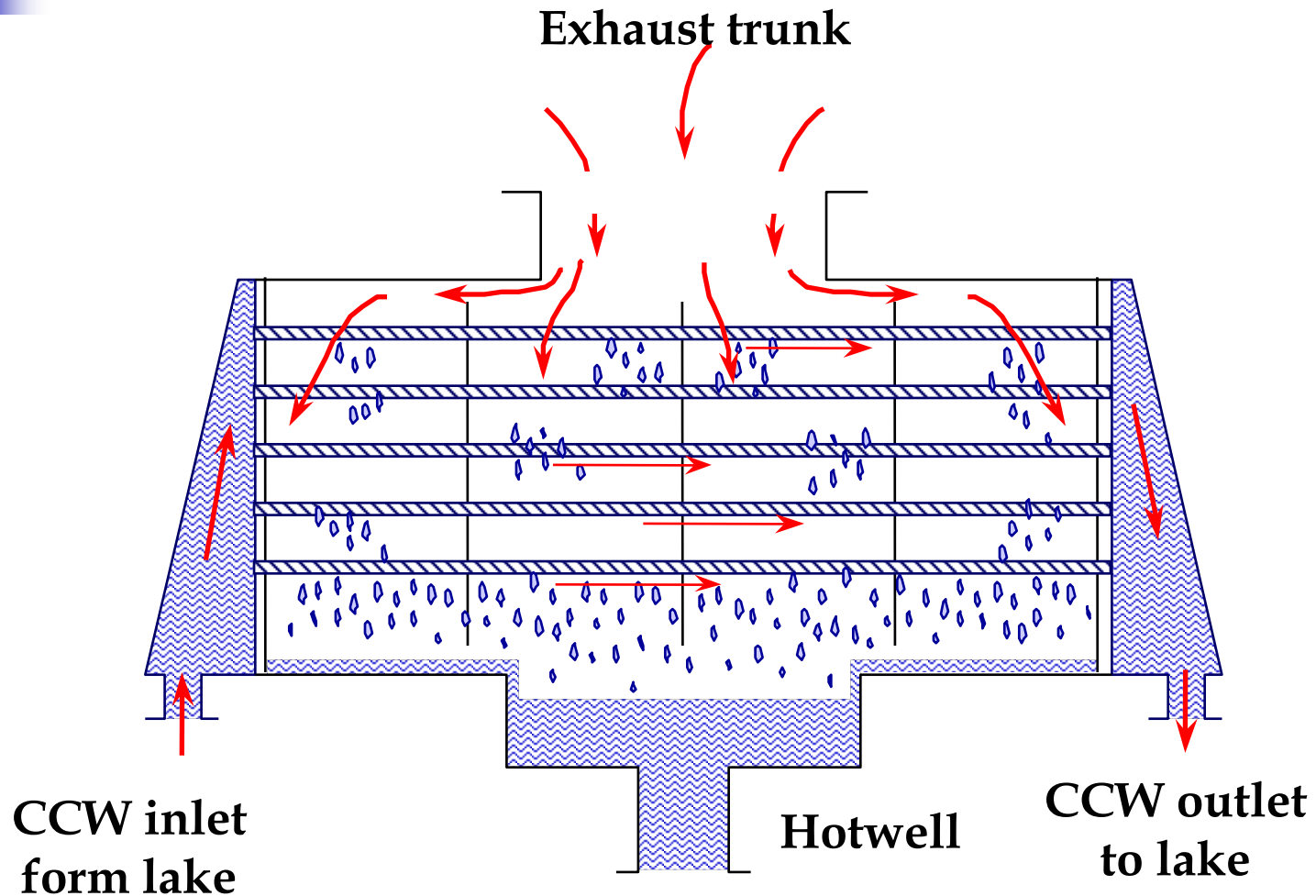


# Double Flow Turbine

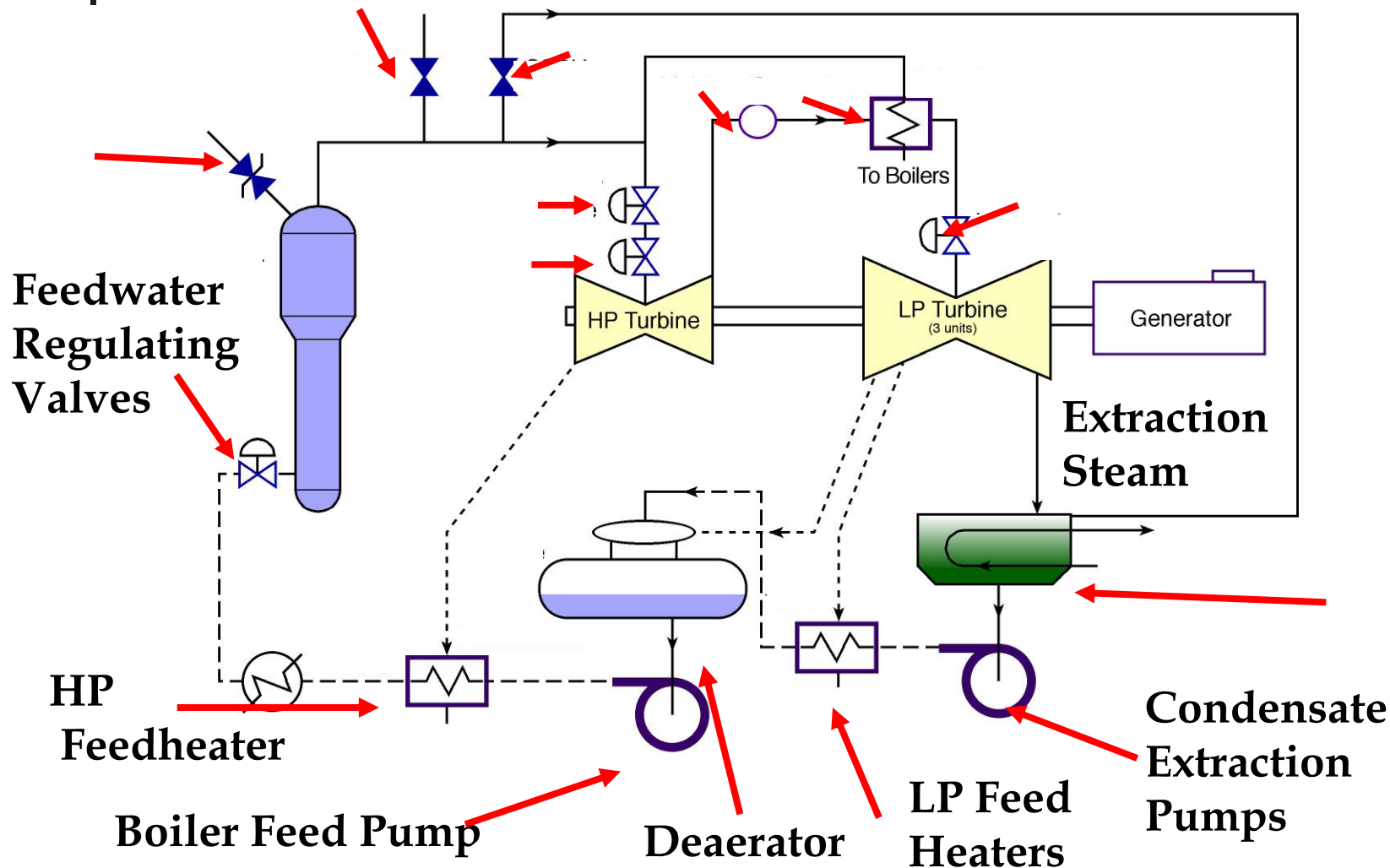




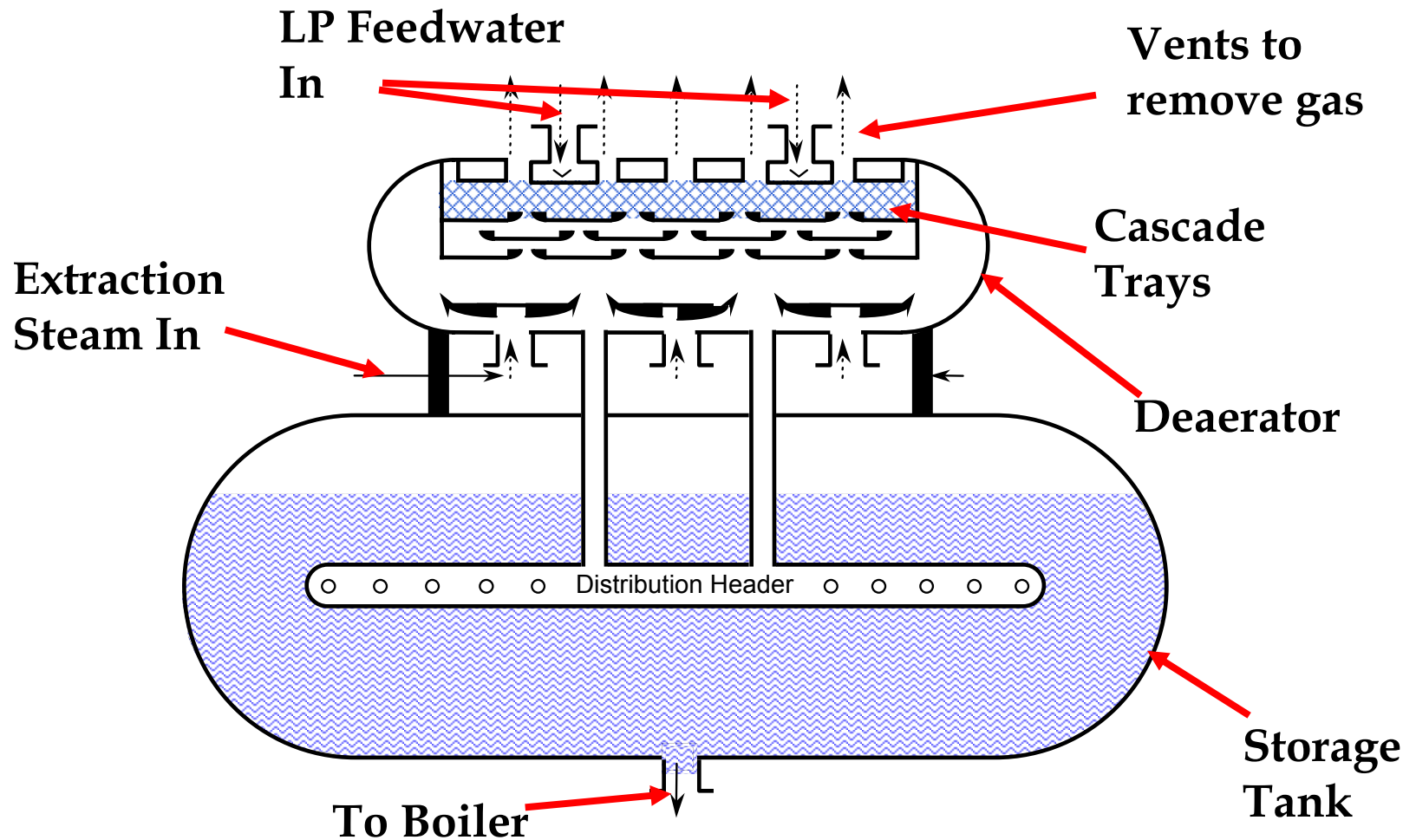
# The Condenser



# Simplified Feedheating System and Steam System

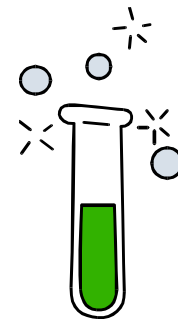
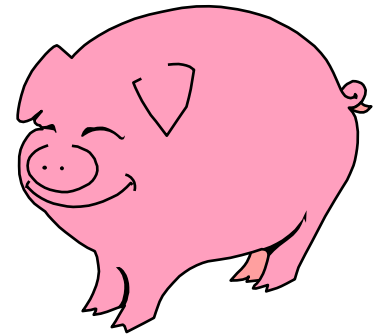


# Deaerator and Storage Tank



# Other Important Things

- **Lubrication**
  - jacking oil
  - main oil
- **Turning Gear**
  - hog
  - sag
- **Chemical Control**
  - Prevent Corrosion
  - Oxygen removal
  - Maintain pH





# The Generator

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The Output Machine

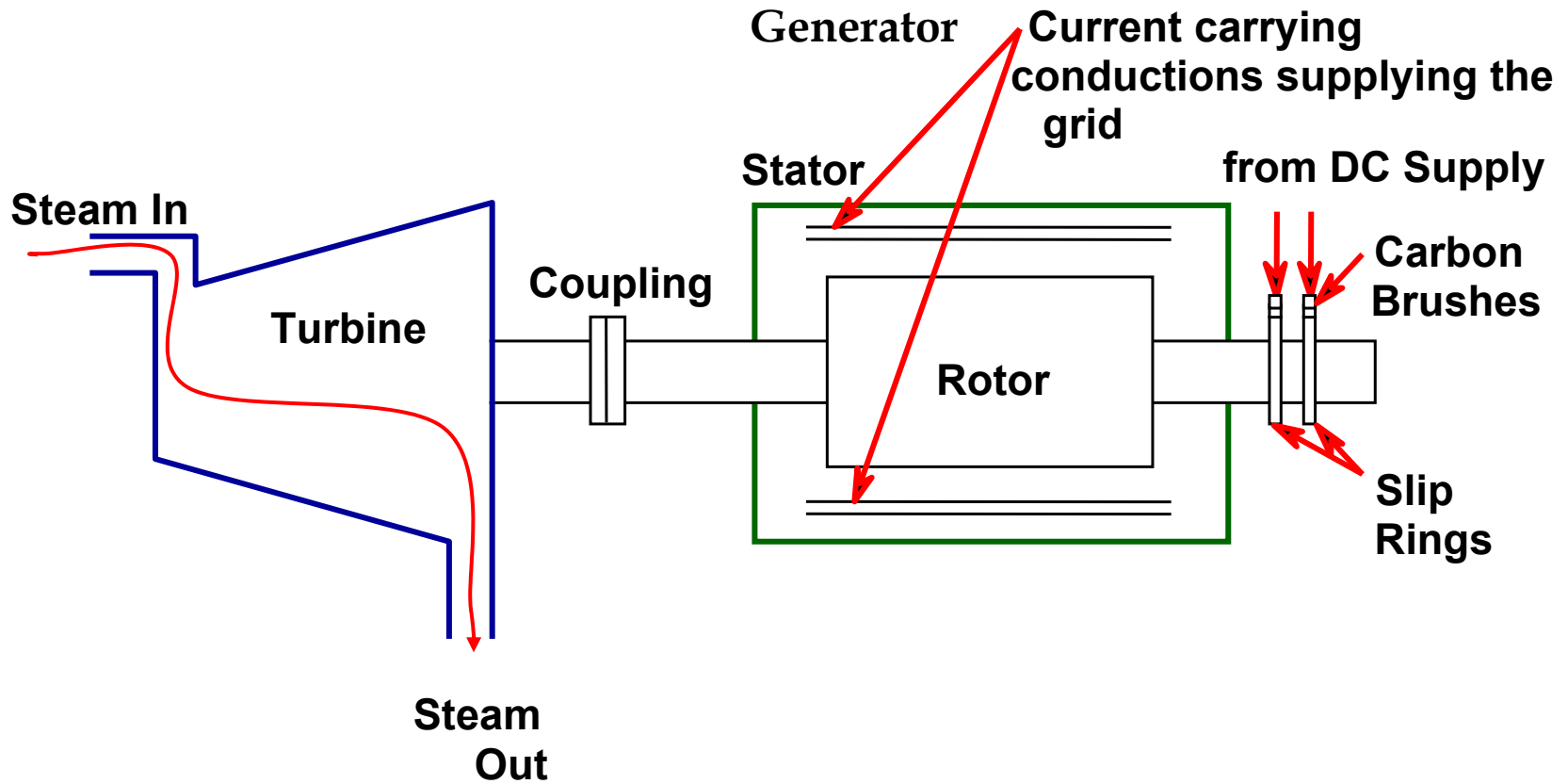
# What do we need to generate electricity?

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- ◆ **A Magnet**
- ◆ **Coils of wire**
- ◆ **Motion between them**

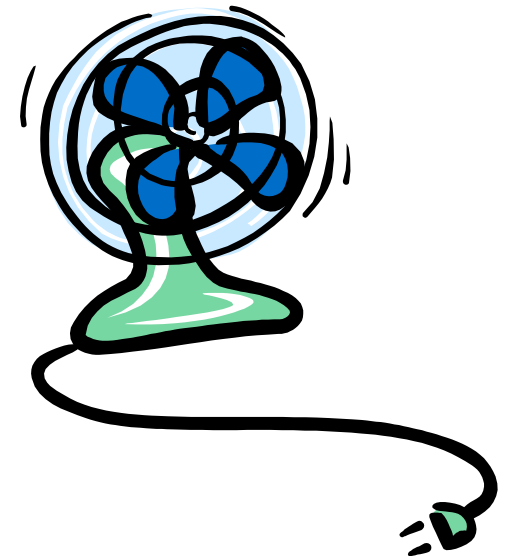


# Generator Coupled to a Turbine



# Generator Cooling

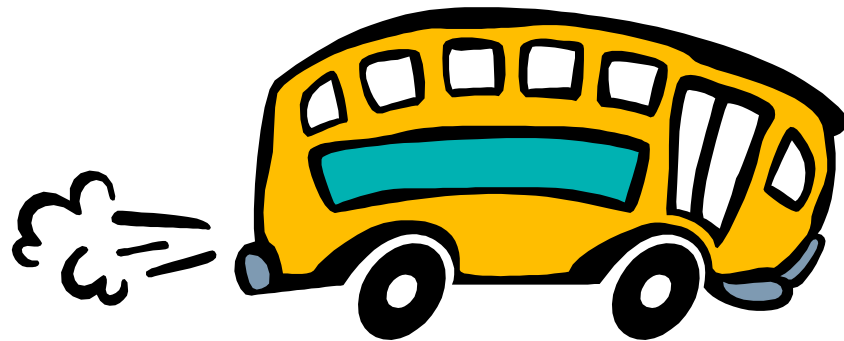
- Heat Generation
  - Windage
  - Electrical heating in rotor and stator
  - Electrical heating of structural material
- Cooling
  - Hydrogen Cooling
  - Stator Water Cooling





# Strange Generator Behaviour

- Unsynchronized
  - speed changes with GV opening
- Synchronized
  - speed is constant regardless of GV opening





# Hazards

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# Hazards

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- Chemical

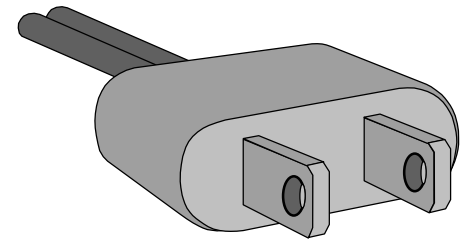
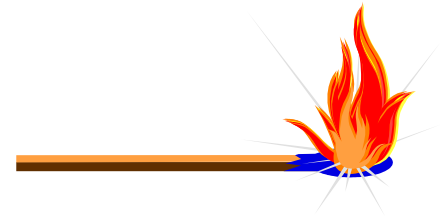
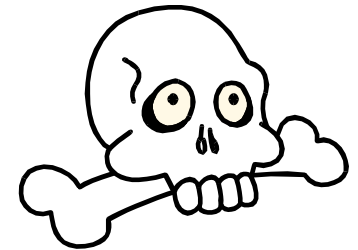
- Hydrazine
- Morpholine
- Ammonia
- Hydrogen

- Thermal

- Hot pipes
- Steam leaks

- Electrical

- Shock
- Burns



# More Hazards

- Mechanical
  - Moving Parts
- Noise
- Pressurized Fluids
- Radiation
  - Under abnormal circumstances

