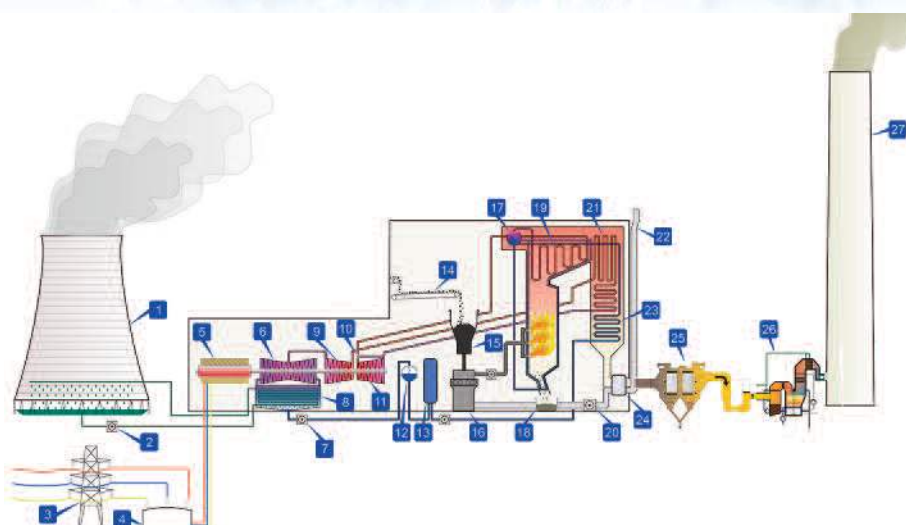




1. Cooling tower
2. Cooling water pump
3. Pylon (termination tower)
4. Unit transformer
5. Generator
6. Low pressure turbine
7. Boiler feed pump
8. Condenser
9. Intermediate pressure turbine
10. Steam governor
11. High pressure turbine
12. Deaerator
13. Feed heater
14. Coal conveyor
15. Coal hopper
16. Pulverized fuel mill
17. Boiler drum
18. Ash hopper
19. Superheater
20. Forced draught fan
21. Reheater
22. Air intake
23. Economizer
24. Air preheater
25. Electrostatic Precipitator
26. Flue Gas Desulfurization
27. Chimney stack

ECD Product Solutions	Model T80 Transmitter Single Channel	Model T80 Transmitter Two Channel	Model S80 pH Sensors	Model S80 Conductivity sensors	Model FC80 Free Chlorine Analyzer	Model TC80 Total Chlorine Analyzer	Model CA6 Colorimetric Analyzer	NA6 Sodium Analyzer	Model DO90 /DO92 ppb DO Analyzer	Model DO82 ppm DO Analyzer	Model TR86 Turbidity Analyzer
Makeup water pH											
Makeup Water Conductivity											
Makeup Water Free Chlorine											
Makeup Water Total Chlorine											
Makeup Water Conductivity % rejection											
Makeup Water Silica											
Makeup Water Sodium											
Condensate Dissolved Oxygen, ppb											
Condensate pH											
Condensate Conductivity											
Condensate Cation Conductivity											
Condensate Silica											
Condensate Sodium											
Feedwater Dissolved Oxygen, ppb											
Feedwater Conductivity											
Feedwater pH											
Feedwater Cation Conductivity											
Boiler Water Dissolved Oxygen, ppb											
Boiler Water pH											
Boiler Water Conductivity											
Boiler Water Cation Conductivity											
Boiler Water Silica											
Boiler Water Sodium											
Cooling Water pH											
Cooling Water Conductivity											
Cooling Water Free Chlorine											
FGD Scrubber pH											
Effluent pH											
Effluent Conductivity											
Effluent Total Chlorine											
Effluent Dissolved Oxygen											
Effluent Turbidity											

ELECTRO-CHEMICAL DEVICES

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Liquid Analytical Instrumentation for the Power Generation Industries



Accurate and Reliable Process Measurement

- pH
- ORP
- Conductivity
- Resistivity
- Free Chlorine
- Total Chlorine
- Dissolved Oxygen
- Phosphate
- Ammonia
- Sodium
- Silica



ELECTRO-CHEMICAL DEVICES

Makeup Water

Raw water is chlorinated, to prevent microbial growth in Pretreatment and then dechlorinated. The water may be pretreated by reverse osmosis, lime softening or sodium softening to remove excessive hardness. It is finally demineralized using Ion exchange resins, typically in Cationic, Anionic and Mixed Bed exchangers.

Measurements: • Free Chlorine
• Total chlorine • pH • Conductivity
• Resistivity • Silica • Sodium
• Dual conductivity, % rejection



Industrial Analytical Measurement Designed for Power Plants

- **S80 High Purity Water pH Sensor** - designed for long life and quick easy electrode replacement.



no need to replace the complete sensor
-- just the HPW electrode

- **FC80/TC80 "Reagentless" Chlorine Analyzers** - simple installation and low maintenance



no costly reagents needed
-- lowers overall running cost

- **NA6 Sodium Analyzer** -

Low level ppb and wide measuring range



lower operating cost
-- Low reagent consumption
-- no moving parts



T80 Universal pH, ORP
ION, Conductivity,
Resistivity transmitter



CSX2 Conductivity
Resistivity Sensor



CE800 Cation
Conductivity Sensor



S80 High Purity pH
Sensors



S80 Conductivity
Sensors

Condensate

Steam is condensed to water and collects in the hotwell. Leaks in the Condenser tubes can introduce impurities, gasses and corrosive salts from the cooling water. Leaks must be detected quickly to avoid damage to the boiler. Impurities are removed by the condensate polishers and the purified water is blended with the Make Up water to become Feedwater.

Measurements: • Dissolved Oxygen, ppb level • Cation conductivity
• Conductivity • High Purity pH
• Sodium • Silica

Condenser

Hot
Water

Cold
Water

Cooling Tower

The cooling tower uses evaporative cooling to provide the Condenser and other heat exchangers with cooling water. The pH of the water is monitored to minimize scaling and corrosion. The blowdown is controlled by conductivity.

Measurements:
• pH • Conductivity
• Free and/or Total Chlorine

Feed Water

The Feedwater is preheated, deaerated and sent to the Economizer and Boiler. The water quality requirements of the boiler must be met at this stage to assure the boiler efficiency and steam quality. Impurities in the feedwater may cause corrosion in the boiler piping and will increase the rate of blowdown.

Measurements:

- Dissolved Oxygen, ppb level
- Cation conductivity
- Conductivity • High Purity pH

Boiler Water

The boiler converts water into steam. Steam is separated from water in a drum boiler, and any contaminants are concentrated in the water as the steam is generated. These impurities are removed by Blowdown. High concentrations of dissolved solids can form deposits on the heater tubes lowering the efficiency or corroding the super heater tubes. Steam quality also suffers allowing solids carryover that will deposit on the turbines.

Measurements:

- High Purity pH • Silica • Conductivity
- Cation conductivity • Sodium
- Dissolved Oxygen, ppb level

Steam

Blowdown

HP/LP Turbines

Superheater

Effluent

Water from cooling tower blowdown, resin bed regeneration and any other water that cannot be reused must be treated to the environmental standards before being released from the plant

Measurements:

- pH • Conductivity • Total Chlorine
- Dissolved Oxygen • Turbidity

Scrubbers

Flue gas desulfurization removes sulfur dioxide, SO_2 , an acid rain gas from the flue gas. A suspension of limestone is sprayed into the flue gas, the SO_2 reacts with the limestone and air to precipitate gypsum which is separated and sold.

Measurements:

- pH



FC80 or TC80
Chlorine Analyzers



TRITON TR86
Turbidity



TRITON DO92 ppb
Dissolved Oxygen



CA6 Colorimetric
Silica Analyzer



NA6 Sodium
Analyzer