

Partner For Level & Flow Measurement



Power Plant Solutions

## About SBEM

SBEM Pvt. Ltd. India is pioneer in the field of Level Instrumentation Firmament. Started in 1974, we have established ourselves as a complete solution provider to various industrial segments. It is this domain experience of more than 3 decades, which sets us apart from our competition. Since building the first ever Tank Level Gauge in late 70s, SBEM has been the first Indian brand in indigenous level measurement technology. The company has also ventured extensively into the flow measurement domain.

Having established itself as a business leader in industrial instrumentation, SBEM has strived hard to raise the bar in measurement applications. To its credit, the company has a ISO 9001 certification for its quality systems and also a DSIR-recognized technology and design-centre. Add to this a dedicated R&D team, which incorporates cutting-edge technology matching international standards are customized to Indian conditions.

Using our indigenous expertise, we offer diverse solutions to successfully cover every aspect of level measurement for both liquid and solid applications. Our foray into flow measurement has also been flourishing, with products based on multiple technologies being introduced into the market.

## Anything to everything in POWER PLANT SOLUTION:

Our ambition to grow into India's finest Level and Flow measurement solutions company, SBEM serves its customers to the best of its ability. Our one of the key segment is Thermal Power Plant-Instrumentation.

SBEM provides equipment, which ensures comprehensive measurement of all essential level & flow parameters of the thermal Power Plant. Covering end-to-end processes in a thermal plant, SBEM provides high precision switches and transmitters for all duties.

SBEM has solution for Level & Flow Measuring equipments in following packages in Thermal Power Plant

- Steam Turbine
- Turbo Generator
- Condensor / Heat Exchanger
- Condensate Polishing Unit (CPU)
- Coal Handling Plant (CHP)
- Ash Handling Plant (AHP)
- Fuel Oil Handling
- DM Plant
- Pre Treatment - Water Treatment Plant (PT-WTP)
- Effluent Treatment Plant (ETP)
- Fire Protection



## Coal Handling

Coal is the main fuel in most of the power plants in India. It is stored in bunkers (normally up to 30mtr.). During filling and withdrawal of coal from bunkers, there will be heavy dust inside the bunker. Reliable continuous level measurement guarantees uninterrupted supply for the furnace and point level sensors prevent overfilling in the bunkers and hoppers. Air purging facility keeps the dust from accumulating inside the antenna.



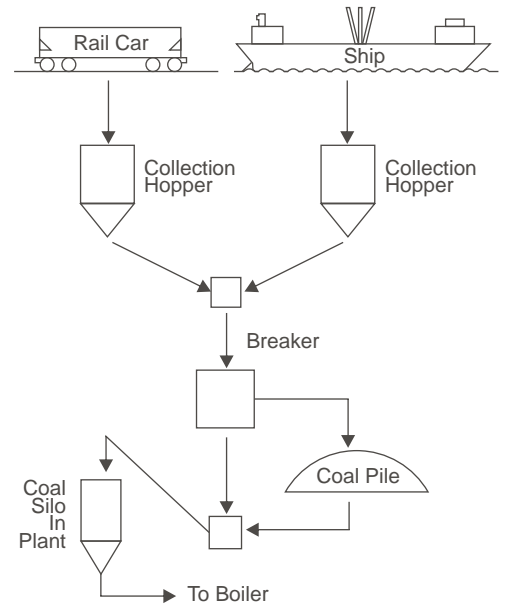
### Solution



Continuous Level:  
Model 138 K58  
Pulse Radar



Point Level:  
Model 135LC  
Rotary Paddle Type  
Level Switch



## Ash Handling



Fly ash filtered out of the flue gases is stored in large silos up to 70mtrs. in height. Since fly ash particles are very fine and tend to form a coating, non-contact type level measuring instrument is very much essential. Air purging facility keeps the dust from accumulating inside the antenna. Since fly ash also adds to the revenue of the industry, accurate and reliable continuous level measurement is needed.

### Solution

The ash particles in the flue gas are filtered out with large electrostatic filters and stored in part in very large silos. In those silos that can be up to 70 m high, non-contact measurement of the contents with a 138 K58 radar sensor is the ideal solution. All types of fly ash can be measured reliably with it.



Continuous Level:  
Model 138 K58  
Pulse Radar



Point Level:  
Model 114RFS  
RF Admittance

## Main Oil Tanks

Capacitance Type Level Transmitter or Guided Wave Radar Level Transmitter is used in Main Oil Tank (MOT) having Turbine Oil. Turbine Oil is used for lubrication of turboset. Three Nos Transmitters are used in each tank. Output of each transmitter should be almost similar. BHEL uses 2 out of 3 logic, accurate and repeatable measurement is extremely essential, else the turbine will trip. As capacitance type technology depends of various process parameter of liquid, GWR is preferred nowadays due to its least dependence of process parameter.



Capacitance Type Single Point Level switch (Model 114) is used in Control Fluid Tank (CFT) having Fire Resistant Fluid (FRF). FRF is used as electro-hydraulic control fluids in Turbine Governor Systems.

### Solution



Continuous Level:  
Model 132 GWR  
Guided Wave Radar  
Level Transmitter



Point Level:  
Model 114 MLS  
Capacitance Level Switch

## Fuel Oil Storage

### Application:

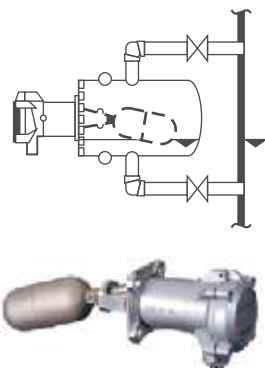
Fuel-fed ignitors initiate the boiler flame in coal-fed plants using light diesel oil or heavy fuel oil.

Continuous and accurate measurement of level with transmitter to enable monitoring the stock in control room is preferred. As the liquid stored is hazardous the transmitter used has to be certified for hazardous area application. To add to the safety, high and low level switches in explosion proof enclosure, which are independent of transmitters are used.

### Solution



Point Level:  
Model 137 D/P  
Displacer Level  
Switch



Point Level:  
Model 137 EA  
Float Type Level  
Switch



Model 133+TWT  
Float & Tape

## Filter Beds



### Application:

Following the clarification phase of water treatment, pre-filtered water passes from an inlet channel and onto a filtration bed. As it passes through the bed's media—sand or anthracite in depth-filtration types; cloth or synthetic membranes in surface-filtration types—the water is cleansed of its fine-grained suspended solids.

Filter tank level triggers the backwash cycle. As solids accumulate within the filter, head loss begins to build up and water level increases in the filter tank. A pre-determined tank level indicates that terminal head loss value has been reached, and that the filter must now be backwashed to remove the suspended solids.

### Solution



Differential Level:  
Model 104 LOH  
Loss of Head Indicator  
Transmitter

Model 103 HPT  
Hydrostatic Pressure  
Transmitter

## Condensate Storage In Condensate Polishing Unit In Demineralisation Plant

### Application:

When the condenser hotwell level reaches the high point, a valve opens to drain excess condensate from the hotwell to a condensate storage tank. When loss of condensate from the turbine cycle is reflected in a low level in the hotwell, a make-up valve opens in the storage tank to supply make-up water to the condenser hotwell.

Proper functioning of the liquid level control in the condensate storage tank ensures the proper supply of make-up water.



### Solution



Continuous Level:  
Model 136 ULT  
Ultrasonic Level  
Transmitter



Indication:  
Model 131  
Float & Board



Point Level:  
Model 137D  
Displacer  
Level Switch

## Acid Storage & Alkali (NaOH) Storage Tanks

Solution



Continuous Level:  
Model 138 C51, 138 K55  
Pulse Radar



Model 132 GWR  
Guided Wave  
Radar Level  
Transmitter



Point Level:  
Model 137 Y  
Displacer Level  
Switch in  
Polypropylene  
wetted parts



Model 130 IC/RC  
Conductivity Level  
Switch



Model 137C  
Float Level Switch  
in Polypropylene  
wetted parts

## Boiler Blowdown Tank

Application:

The concentration of undesirable solids in boiler feed water can be reduced through the use of a continuous purge or blowdown system. A blowdown tank receives continuous blowdown from the steam drum and blowdowns of variable temperatures and pressures from the steam generator. A blowdown tank can also function as a gravity feed drain for the steam generator when the generator is drained for maintenance.



Good boiler blowdown practices can greatly reduce a boiler's water treatment needs and operation costs. Combustible mixtures left in a boiler due to improper purges, however, have been known to cause catastrophic explosions. Proper tank level controls are essential to ensure a safe and effective boiler blowdown system.

Solution



Continuous Level:  
Model 132 GWR  
Guided Wave Radar Level Transmitter



## Flash Tank

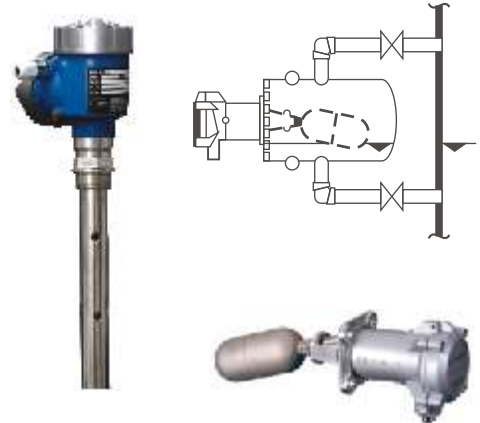


### Application:

A flash tank serves as a collection system for a variety of condensate drain lines. Flash tanks receive high pressure condensate which is then exposed to a low pressure steam source.

When this occurs, a certain percentage of condensate will “flash” to steam at the lower pressure. This steam can be “recycled” on other low pressure steam heat transfer applications.

Level measurement is necessary to control flash tank level. The challenges are elevated temperatures and pressures.



Continuous Level:  
Model 132 GWR  
Guided Wave Radar  
Level Transmitter

Point Level:  
Model 137 EA  
Float Type Level  
Switch with  
External Cage

## Demineralization Tanks



### Application:

Because modern high-pressure boilers evaporate large volume of water every hour, the purity of feed water circulating inside the boiler is critical . Chemical treatment reduces scale-forming materials and corrosive oxygen content. A Feed water Evaporator can be used as an alternative method to chemicals by removing impurities through evaporating raw water with extraction steam. Most often, the purity of feed water is achieved by chemical treatment.

Chemicals used for water treatment can include caustics, sodium hypochloride, sulphuric acid or other additives, individual chemistry and storage requirements will dictate the type of level instrumentation selected.

### Solution



Continuous Level:  
Model 136 ULT  
Ultrasonic Level  
Transmitter

Model 133+TWT  
Float & Tape

Model 103 HPT  
Hydrostatic  
Pressure  
Transmitter

Indication:  
Model 131  
Float & Board

Point Level:  
Model 137 EA/C  
Float Type Level  
Switch with  
External Chamber

## Flow Measurement In Waste Water/ Effluent Treatment Plant Water Intake

Water Flow  
Measurement  
Model 151 MFM  
Electromagnetic  
Flow Meter



## Cooling Tower

Open-system cooling towers reject waste heat from the steam cycle by exposing the cooling water directly to the atmosphere. The majority of heat removed is due to evaporation and the remaining cooled water drops into a collection tank. Level control applications include a high level switch to avoid overflow conditions in the cooling tower tank.

In induced draft cooling tower, measurement of lubricating oil level for fan bearing, is very critical. It is common to use either continuous level transmitter or a low level switch, to replenish lubricating oil stock if



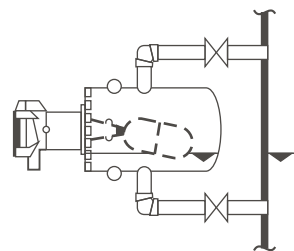
### Solution



Continuous Level:  
Model 103 CLT  
Capacitance



Model 103 HPT  
Hydrostatic  
Pressure  
Transmitter



Point Level:  
Model 137 EA  
Float Type Level  
Switch with  
External Cage  
Gear Box Oil Level  
measurement



Model 137 D  
Displacer Level  
Switch



Model 130 IC/RC  
Conductivity Level  
Switch





# Open Atmosphere Sumps And Open Channels In Waste Water/ Effluent Treatment Plants

## Application:

Power generating facilities have large, open atmosphere collection basins known as sumps that are usually found in

Waste water treatment areas. Often constructed of concrete with depths ranging from one to four metres, sumps function as collection and treatment sites for waste liquids ranging from storm water drains to excess make-up water. With many possible uses for sumps, chemical composition and temperatures will vary.



Proper level control will help ensure the continuous operation of collection and processing of collected water. Level controls in these areas must often tolerate corrosive media, harsh chemicals, liquids with high solids content and harsh weather conditions.

## Solution



Display in field:  
Model 103HTL



Control Room Display:  
Model 191  
Flow Indicator Totaliser

Continuous Level:  
Model 136 ULT  
Ultrasonic Level  
Transmitter  
With Model 191 Flow  
Indicator Totaliser

Model 103 CLT  
Capacitance

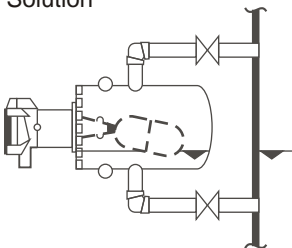
Model 104ROF  
Rate of Flow Level  
Transmitter

Point Level:  
Model 137D  
Displacer  
Level Switch

# Condenser & Condensate Tanks

IBR approved switches for high Pressures and high temperatures.

## Solution



Point Level:  
Model 137 EA  
Side Mounted Float type level switch  
With External chamber



Model 137 D  
Top mounted Displacer Level  
Switch



## Lubrication Oil Tanks

### Application:

Generators and gas turbines will have integral lubricating systems to prevent damage caused by excessive friction. Often a portion of the lubricating oil is used in the hydraulic oil systems for hydraulic control devices. Lubricating oil is typically stored in integral stainless steel and carbon steel tanks that are monitored for level. A generator gearbox

lube oil system may have a reservoir with a capacity of 3,000 gallons and a turbine oil system may have a reservoir with a capacity of 150 gallons.



Adequate level monitoring of lube oil reservoirs will ensure the proper functioning of turbines, electrical generators and other equipment with integral lubrication systems.

### Solution



Continuous Level:  
Model 136 ULT  
Ultrasonic Level  
Transmitter

Model 132 GWR  
Guided Wave  
Radar Transmitter

Model 138  
Pulse Radar

Model 103 CLT  
Capacitance

Point Level:  
Model 137 EA  
Float Type Level Switch

## Water Wash Tanks

### Application:

The compressor of a gas turbine ingests a large amount of air containing particulate matter, aerosols of hydrocarbons and other organic compounds and gases. Although the larger solid particles are filtered out, the other compounds are deposited on the compressor blades. Compressor washing removes this deposited fouling. Also used for cleaning generator or other machinery and equipment components, water wash is periodically discharged as waste water.

### Solution



Continuous Level:  
Model 136 ULT  
Ultrasonic Level  
Transmitter Switch

Model 103 HPT  
Hydrostatic  
Pressure  
Transmitter

Point Level:  
Model 137D  
Displacer Level

Model 114 MLS  
Capacitance  
Level Switch

## Water Services

### Application:

Service water is utilized for general plant services that include pump and instrument seal water, fire water, demineralization, cooling and make-up water supply. Storage tanks with a capacity to support three days to one week of operation, allow continued plant operations in the event the supply of water is interrupted. Collectors and storage tanks are typically fixed roof, vertical cylindrical steel tanks.



Display in field:  
Model 103HTL



Control Room Display:  
Model 176  
Digital Process Indicator

### Solution



Continuous Level:  
Model 136 ULT  
Ultrasonic Level  
Transmitter



Model 132 GWR  
Guided Wave Radar  
Transmitter



Model 103 HPT  
Hydrostatic Pressure  
Transmitter



Point Level:  
Model 137D  
Displacer  
Level Switch

## Major projects handled in Thermal Power Sectors

End User	Location
MAHAGENCO	Khaparkheda, Bhusawal, Koradi, Chandrapur, Paras, Parali
MPGENCO	Satpura, Malwa
APGENCO	Rayalseema
Punjab State Electricity Board	Bhatinda
Gujarat State Electricity Board	Ukai, Uttaran, Pipavav, Navi Naroli
NTPC	Vindhyachal, Sipat, Barh, Korba, Ramagundam, Unchahar,
Reliance Energy	Dahanu, Rosa, Krishnapatnam, Sasan
Essar Power	Mahan
Jaypee Power	Bina
Coastal Energen Pvt. Ltd.	Tuticorin
Neyveli Lignite	Barsingsar
Pragati Power	Bawana
Jindal Steel & Power Ltd.	Tarapur, Dongamohua, Ratnagiri, Tamnar, Angul. Bellary
Aravalli Power	Jhajhar
Lanco Infratech, Gurgaor	Udupi, Amarkantak, Wardha, Kondapalli, Anpara
Meenakshi Energy	Krishnapatnam
GMR Energy Limited	Rajkheda
GVK Power	Punjab
Hindalco	Mahan, Lapanga, Hirakund, Moori, Ranchi
India Bulls	Amravati. Nasik
Adani Power	Mundra, Tiroda, Kawai



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