

# AUTOMATIC GATES

"A COMPLETE SOLUTION FOR WATER STORAGE MANAGEMENT"



ELEVATION OF EXCELLENCY



AMANZIFLOW PROJECTS (PTY) LTD., SOUTH AFRICA  
UNIVERSAL HYDRO STRUCTURES PVT. LTD., INDIA



## ABOUT US

**Amanziflow Projects (Pty) Ltd.** (AFPL) is a South African Company, which offers consultancy and design of Automatic Water Control Gates and Equipment. These gates are highly specialized, innovative and unique in the world, as they neither require any electrical supply nor human intervention. These gates are best replacement for conventional vertical lift or radial gate system, offering outflow regulation capability in both automatic and controlled mode.

AFPL has 25 years of experience and holds the credit of successful projects running in many countries across the world.

**Universal Hydro Structures Pvt. Ltd.** (UHSPL) is a growing infrastructure construction, development and management company, with wide experience and proven expertise in manufacturing, installation and commissioning of Automatic Gates, Cross Country Pipelines and other infrastructure activities with an established track record of successful execution of projects across sectors and geographies.

UHSPL provides end-to-end infrastructure implementation solutions that include engineering, procurement, installation and commissioning (EPIC) services on a lump sum turnkey basis as well as on item rate basis.

**In India, AFPL has joined hands with UHSPL to manufacture, install and commission; plus market its specialized, innovative & unique products to spread its pugmark in Indian Territory.**





UNIVERSAL HYDRO STRUCTURES PVT. LTD.

## VISION & PHILOSOPHY

AFPL & UHSPL aims to be the leaders in Automatic Self-Actuating Water Control Gates and Equipment in Indian Territory. In this age of technological revolution and globalization, one has to think globally and act locally in the best interest of value creation and nation building.

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## STRENGTHS

- Expertise and experience in project management.
- Strong financial performance & credit profile.
- Integrated in-house design & engineering expertise.
- Established relationship with public sector clientele.
- Highly qualified management team.
- Experienced employee base.
- Proven track record of successful installation & commissioning of Automatic Gates since past 25 years.





## AMANZIFLOW PROJECTS (PTY) LTD.

# GENERAL

Water is an essential element for growth and development. The increased demand of water for irrigation, domestic and industrial purpose propels us for better water management in existing reservoirs. Building more dams has restrictions due to social, economical and environmental concerns attached to it.

Most of the existing ungated spillway of dams, weirs and barrages can be installed with gates to increase their storage capacity. However, conventional electromechanical or manually operated gates have some limitations and do not achieve our goal of complete solution. There is a need for much better technology, which ensures optimum storage capacity and dam safety as well.

**“The answer is Automatic Gates.”**

TYPE OF SPILLWAY	UNGATED		GATED	
	CONVENTIONAL RAISING	MANUAL	ELECTRO MECHANICAL	FULLY AUTOMATIC
FEATURES				
COST	X	X	✓	✓
ENVIRONMENTAL	X	0	✓	✓
MAINTENANCE	✓	X	X	✓
RETAIN STORAGE AFTER LARGE FLOODS	✓	0	0	✓
TIME TO CONSTRUCT	X	0	0	✓
RELIABILITY	✓	X	0	✓
NO OPERATOR OR ELECTRICAL POWER REQUIRED	✓	X	X	✓
EMERGENCY DRAW-DOWN/ LARGE RELEASES	X	✓	✓	✓

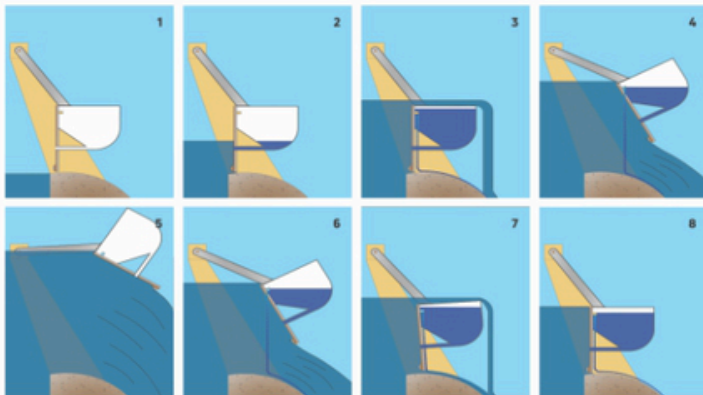
X = Disadvantages

0 = Possible Disadvantages

✓ = Advantages



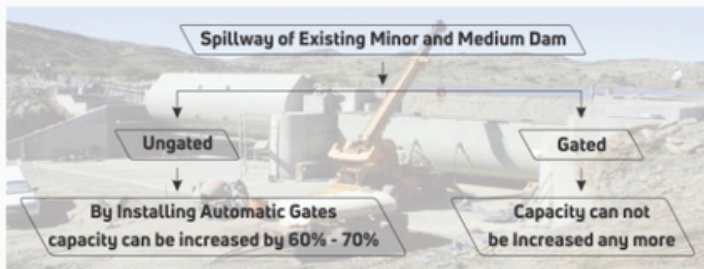
## OPENING AND CLOSING STAGES OF AUTOMATIC GATES



## SOCIO ECONOMIC BENEFITS OF INSTALLING AUTOMATIC GATE AT EXISTING DAM

By installing these gates at spillway of existing minor & medium sized dam, we can increase the storage of water which can be utilized to increase irrigation potential, domestic needs of increasing population (Deposit work of Nal Jal Yojana) and industrial purposes (Deposit work of Industries Department)

- a) **Cost Saving :** In present scenario, construction of minor and medium sized dam costs somewhere between Rs. 10 Crores to Rs. 50 Crores. By installing Automatic Gates, dam capacity can be increased up to double the capacity at a substantially low cost of Rs. 3 Crores to Rs. 5 Crores.
- b) **Time Saving :** Construction of new dam takes 12 to 18 months of time whereas Automatic Gates can be installed within a short time of 4 to 5 months.
- c) **Land Saving :** Construction of new dam requires certain area of Land (100 Hect. to 500 Hect.) whether Government owned or privately acquired. By increasing the capacity of existing dam, this valuable land can be saved for future projects.



## PRINCIPLE OF AUTOMATIC GATES

Automatic gates have been designed to function on the principle of moments. The gate functions automatically by responding to changes in water levels on upstream.

The gates automatically regulate the outflow by deciding on its own when to open, how much to open and how long to remain open.

Automatic Gates have level controlled triggers, which open the gates sequentially as the water level rises and closes with the receding water level to ensure that the water is stored up to FRL.



### SCOPE OF AUTOMATIC GATES

#### A | FOR INCREASING THE CAPACITY OF EXISTING DAMS

Automatic Gates can be installed on ungated spillway of existing medium and minor sized dams, weirs and barrages to create additional storage capacity on the upstream and regulate the surplus flood by automatic opening mechanism safely to the downstream, ensuring safety of the existing structure.

There are many small and medium sized dams with ungated spillway. **Every year gallons of water is wasted in rainy season through spillway of these dams, which can be tapped by installing Automatic Gates.** Principally, design of any dam involves land acquisition up to submergence area of MWL, which is normally 1.0 to 1.5 meter above FRL. So, by installing these Gates at spillway between FRL (CL) and MWL, we can optimally utilize the capacity of Dam and can effectively store up to 160% of the existing capacity of Dam, without modifying Civil Structure as Automatic Gate can be installed on portal frames made up of steel. These Gates are Patented and successfully functioning in many projects in India and Worldwide.





### **B** | FOR SAFETY OF EXISTING DAMS DUE TO CHANGE IN HYDROLOGY

Due to Global Warming, there is a change in the statistical distribution of rains. In some regions, there is sudden and heavy unpredictable downpour of rain within a short span of time, causing flash floods, which is almost twice or thrice the designed capacity of waste weir/spill channel to handle flood.

**As per report of DRIP & DSARP**, many waste weir/spill channels of Dams are designed with certain flood but over a period; it has been observed that flood is much more than original design. To mitigate this extra flood, either the length of spill channel is to be increased or the height of spill channel is to be decreased to pass extra flood.

In many cases, it is not feasible to increase the length of spill channel to cope up with increased design floods due to restrictions, whereas decreasing the height of spill channel will reduce the storage capacity of the dam, which will further reduce the Irrigation Potential.

Decreasing the height of spill channel & installing Automatic Gates is the best suited solution, as by decreasing the height of spill channel, we can pass extra flood and installing Automatic Gates up to original FRL (CL) will not reduce the capacity of the dam. This system will improve the ability to withstand extra floods as per latest hydrological assessment. Moreover, it is economical to install Automatic Gates rather than increasing the length of waste weir / spill channel.





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### C | FOR INSTALLATION IN NEW MINOR & MEDIUM SIZED DAMS FOR COST EFFECTIVENESS

Automatic Gates are also very suitable for Construction of New Minor and Medium Sized Dam as by installing these Gates at Spillway, level difference between MWL and TBL can be reduced significantly, thereby saving a lot of earthwork and hence, considerable cost.



### D | AS CANAL CROSS REGULATORS AND FOR CANAL ESCAPES

Cross regulators are constructed to head up water in main canal & diverse this water to distributaries & minor canal for irrigation. On occasions, main canal is breached due to failure of operator in opening & closing of gates of main canal, distributaries & minor canal sequentially.

Automatic gates will open with rise of water in main canal & let out excess water to downstream side of canal maintaining the safety of canal. These gates are also best suited for escape head of canals, which diverts excess water automatically.





## **E** | FOR BRIDGE-CUM-BARRAGE (A POLICY OF CENTRAL GOVERNMENT)

Assisting the Central Government Policy of Bridge-cum-Barrage (BCB), Automatic Gates can be gainfully installed on BCB Structures on the d/s side of the existing road bridges to create thousands of small storage for ground water recharges and catering to the domestic need of the population in the vicinity.

In such cases, the Automatic Gates with their support frames are pre fabricated and transported to site. The installation time is very short i.e. 2-6 weeks, depending upon the number and size of the gates.

Since the gate height is restricted to 3 m in BCB installations, Automatic Gates have an advantage as they are top hinged and provide larger bottom openings. It does not obstruct the flow and floating debris, logs, etc. do not have any detrimental effect on the gates.

Since these gates are totally automatic in their operation, they are the ideal product.

## **F** | AS TIDAL GATES IN COASTAL AREAS TO AVOID INGRESS OF SALINE SEA WATER IN POTABLE RIVER WATER

During high tides in coastal areas, the salty water of the sea ingress agricultural land, making them barren. The best remedy to this problem also is to install Automatic Tidal Gates.

They are designed to open automatically to pass flood water of river to the sea. Moreover, if the level of saline water of the sea is higher than the river water, the gates will close automatically to block the entry of the saline water into the river or agricultural land.





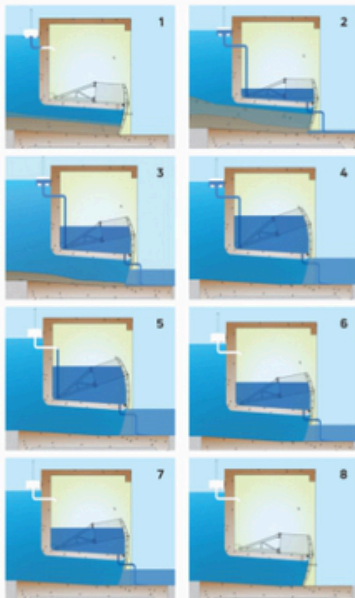
### G | AS AUTOMATIC SCOUR GATES

Sediments origin from many sources within the river basin. When river is stilled behind a dam, the sediment it contains sink to the bottom of the reservoir, gradually reducing the storage capacity of the dam as well as disturbing the natural ecology.

Our Automatic Scour Gates are fitted to the base of a dam or river weir to keep the storage relatively free of sediments. It opens automatically when a flood passes through the dam to pass the sediment laden water, either in suspension or rolling along river bed, through the dam before the sediment settles out and consolidates. It closes automatically to retain FRL in the dam/weir.

The Automatic Scour Gates, in addition to removing sediment, also serves as a valuable flood routing gate to pass floods. It is also useful to provide rapid draw down facility for dam safety purposes if and when required. Therefore, Automatic Scour Gates restricts the loss of storage due to sedimentation, increasing the discharge capacity of the dam for dam safety purposes, preserving the ecology in downstream.

### OPENING AND CLOSING STAGES OF AUTOMATIC SCOUR GATES



### H | FOR RIVER REJUVENATION

Automatic gates are powerful tool for creating cascade of self regulating weirs for river rejuvenation & conservation projects.





## ADVANTAGES & BENEFITS OF AUTOMATIC GATES VIS-À-VIS CONVENTIONAL GATES

### **Dam Safety**

The foremost feature is assured safety at all times. No risk to dam due to power failure, human error in operation or hoist malfunction.

### **Truly Automatic**

No need for any electrical supply and or human intervention to operate. These gates operate on water pressure, while electromechanical gates are dependent on costly and complicated control system involving Scada and Telemetry, which require regular maintenance.

No requirement of trained staff at site.

### **Storage Reliability**

Automatic Gates close automatically after flood to maintain FRL & ensure no loss of water on account of reduced inflow after flood.

### **Flexibility in Operation**

Automatic Gates can be used in controlled mode for discharging water in d/s for environmental or dam safety purpose.

### **No maintenance**

As there are no electro mechanical components, therefore Automatic Gates require no to very little maintenance. So there is no risk of failure due to lack of maintenance.

### **Flexibility in design**

Automatic Gates can be installed on ungated spillway of existing medium and minor sized dams, weirs and barrages with any spillway profile. These gates can be supported on RCC Piers or Steel Portal Frames.

### **Land Saving**

Since no to meager land acquisition is required, costly and limited land resource is spared, which can be used for other purposes.

### **Time Saving**

Automatic Gates can be installed in a minimal time of 2 – 4 months.

### **Other Unparallel ed Benefits**

- Automatic Gates can be designed for practically any size i.e. height ranging from 0.5-10 m and width ranging from 3-20 m, making it very versatile.
- Automatic Gates are most viable solution to be installed on remote locations as there is no need of operator intervention and electrical supply.
- Automatic Gates has been developed to overcome the shortcomings and risk associated with radial and vertical gates and has proven itself under harsh conditions.
- Top Hinged Automatic Gates do not obstruct the flow. Since these gates can be designed very long, therefore less piers are required and height of the piers can also be reduced, saving time and cost and increasing the spillway discharge capacity.

## DIAPHRAGM VALVE

The diaphragm valve automatically regulates a downstream flow into a canal, pipeline or river, with varying upstream water levels. It can also be used to control an upstream water level with varying downstream flows. It can be arranged as a downward facing bend or an upward facing valve, depending on the physical outlet constraints. It can be manually closed and locked, if required, at a required flow rate to prevent unauthorized interference with the flow.



**FIX IT & FORGET IT!**



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