CASE STUDY: SPIL'S MPS PERFORMANCE AT ATRAK PULP & PAPER

The case study depicts the efforts made by Sharad Projects India Limited towards the rectification of the issues faced by Atrak Pulp & Paper Company, Iran.

In Atrak Papers, the Paper Machine Backwater was directly being reused in the plant. As the paper machine backwater has high TSS so using the same water in plant was causing adverse effects on the paper quality. Also the consumption of fresh water was high.

Therefore, SPIL proposed **Micro Plate Settler (MPS) with Multi Media Filters (MMF)** to treat backwater. The MPS helps in recovery of fibre from the Paper Machine Backwater and the clarified water of less than 100 ppm is achieved.

ABOUT SHARAD PROJECTS INDIA LIMITED (SPIL):

Sharad Projects India Limited is leading Consultant / Designer in the country in the field of Pulp & Paper Green Field Projects and Day to Day Consultancy.

Beside that SPIL has well-experienced technical team in the area of Environment/Industrial Water Management and providing technical innovation & turnkey solutions for Effluent Treatment Plant, Sewage Treatment Plant and Raw/Canal Water Treatment which comes under the head of water management.

The company is managed by a team of Professionals & Technocrats with an idea to provide turn-key services to various Industries.

The Company's strength lies in designing & erection of major projects providing services, competitiveness and ability to manage multi discipline work force. The commitment to provide customized service according to client's requirement and to suit local conditions has resulted in successful business relationship with clients.

SPIL'S MICRO PLATE SETTLER (MPS):

SPIL'S Micro Plate Settler (MPS) separates settle-able solids particles from liquids and is used for the treatment of process water and waste water. Basically all solids that are settle-able in a given time, can be separated easily and economically with the MPS, depending upon the density those are usually solids larger than approximately 50 µm in diameter. For separating smaller particles and turbid substances, flocculants are used in order to create settle-able flocs.

MPS concept is based on hazen's law i.e. the settling of suspended solids is the function of settling area. Development of Micro Plate Settlers find its design from the roots of hazen's law only. MPS are intended to improve the settling efficiency of fine grain particles by decreasing settling distance.

Micro plate settler designed by Sharad Projects India Limited find its vast application in Pulp & Paper Industry, Water Industry, Textile Industry, Pharmaceutical industry and many more, where large streams of effluents are generated from different processes, operations with high suspended loads.

MPS Design & Features:

- Micro Plate Settler is designed on the basis of latest lamella sedimentation & gravity Technique.
- A cross flow passage is designed for the liquid & solid Flow.
- The Inclined Plate are installed at a specific angle subject to the application
- The Plates are made up of SS-304 Material.
- SPIL provides large entry plane for the fluid to enter in the MPS.
- MOC of the MPS is designed according to the fluid characteristics
- SPIL's MPS requires lesser space as compared to other systems.
- SPIL provides an economical MPS as compared to DAF, Poly Disc Filter, Saveall & Clarifier etc.

Advantages:

- Low Hydraulic Retention times of only 30 min makes the unit very compact, lightweight with high specific clarification. Volumetrically less than 1/5th size of conventional Sedimentation Clarifier.
- Low space requirement.
- SPIL'S MPS works on 95-98% efficiency.
- Low Retention time eliminates chances of septicity of the fibre.
- Very low maintenance cost since there are no moving parts except Flocculation Chamber Agitator.
- Handles shock loads of flow without affecting outlet required result.
- Continuous operation without major down time.
- Individual plate sections can be easily removed.

MPS Applications:

- Paper Machine Backwater.
- Deinking Foam/Sludge Water.
- Canal/Raw Water Treatment.
- Black Liquor Clarification.
- Wet Washing System.
- Replacement of Conventional Clarifier.
- Effluent Treatment Plant/ Sewage Treatment Plant.
- For Fibre Recovery Purpose in Pulp & Paper Industry.

CASE STUDY OF ATRAK PULP & PAPER ON PAPER MACHINE BACKWATER

1. **PROBLEM:**

Atrak Pulp & Paper Company is the only manufacturer of Coated Duplex Board with grey back in Iran. The consumption of fresh water and ETP performance are the bottleneck of their plant.

Their aim was to reduce the **fresh water as well as poly/chemical consumption** by recirculating the paper machine backwater into the process. Paper Machine Backwater of brown layer consist of high TSS (i.e. 8000-10000 ppm) was causing adverse effect on paper quality and excess machine backwater was going to ETP thus increasing load on fresh water consumption.

Backwater is the name given to the process water on paper machine that is reused within the paper making process. The backwater is a mixture of chemicals and fines that were not used the first time around (one pass retention). The backwater can have detrimental effects to the process if the parameters of water fall outside of specific ranges/conditions.

Due to high TSS and low fibre recovery from the paper machine backwater making it unfit to reuse into the process. Atrak site was facing issue in recycling the backwater.

2. SOLUTION:

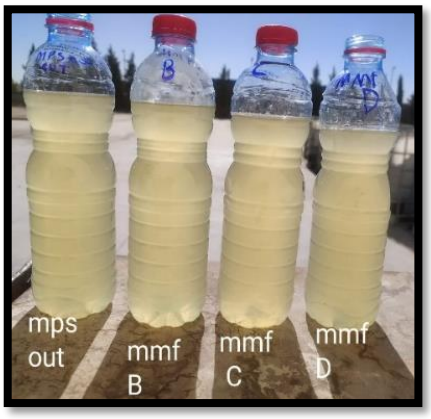
SPIL has installed **Micro Plate Settler (MPS) with Multi Media Filtration (MMF) unit** at **Paper machine back water** at Atrak site and evaluated the MPS readings. The results were very promising and SPIL's MPS performed really well in the backwater application as per SPIL guaranteed. The MPS inlet feed have wide variation of TSS and other parameters. MPS was highly effective in controlling the TSS value of the feed. The Paper Machine Backwater readings are as follows.

Sr. No.	Flow (m^3/hr)	pH Inlet	MPS Inlet TSS (mg/l)	MPS with MMF Outlet TSS (mg/l)
1	80	7.04	3383	59
2	80	7.00	7898	64
3	76	6.99	8493	72
4	79	6.82	9744	70
5	80	6.91	4977	61
6	80	7.00	5223	64

TABLE NO. 1

As it can be seen clearly form the above table that the inlet TSS reading have high variation and after installing MPS with MMF the TSS value in outlet is within the permissible range (i.e. <100ppm). Thus making clarified water suitable for reuse in the plant which resulted in reducing fresh water consumption and also reducing load on ETP. The TSS is collected in the form of fibre and is being reused in the process. Moreover, clarified water is being used in L. P. Showers. Thus fibre and water are both reusable in the process.

BEFORE TREATMENT



AFTER TREATMENT

The installation of MPS with MMF system makes the process cost effective as the cost of fresh water and chemicals is reduced. As the fibre is recovered from hopper, the cost of fibre is also saved.

MPS WITH MMF INSTALLED AT ATRAK PULP & PAPER, IRAN

3. CONCLUSION:

After analysing Table No. 1 readings, it has been concluded that

a. TSS removal efficiency is **95-98% with maximum 2.5 g/m^3** chemical dosing.
b. High Fibre recovery and less wastage of fibre as sludge.
c. Average fibre recovered as per table no. 1 readings is **12.65 TPD**.
d. **Minor Chemical used i.e. approx. 2.5 g/m^3 in the machine backwater clarification system.** Hence huge chemical saving in comparison to other water clarification equipment's.
e. Clarified Water is directly used in LP Showers. Thus reducing load on Fresh Water consumption.
f. Reduced load on ETP.

Therefore, by summing up the case study, it has been proved that SPIL'S MPS has been working efficiently at Atrak Pulp & Paper Company. SPIL has successfully installed trail and commercial plant at site with desired results. The TSS can be further reduced in final outlet with a fine tuning of poly dose considering the inlet flow and charge on water.

Hence SPIL'S MPS is a perfect solution to clarify water from various applications like Paper Machine Backwater, Deinking Foam Water, Wet Washing System, Black Liquor Clarification, Raw/Canal Water Clarification, etc. It is amazing to say that over 100 companies have chosen Sharad Projects India Limited (SPIL) to power their place with technology.