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Alternatives in the use of water in industrial processes: Application in the cleaning of equipment in panel factories

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1. Introduction

The **timber industry** has progressed in wood-based products such as plywood, particleboard, fiberboard, and others (Norhazaedawati et al., 2022). Wood-based panels are products made from fibers, particles, veneer, chips, strands, or any other wood derivate through a binding process with adhesive. These products are also known as engineered wood products as they have a great scope of engineering properties with the specification of the design (Youngquist, J. A., 1999, Pandey et al., 2011).

PM2 methodology is well known as the methodology developed by the European Commission for his projects in the union or abroad (Martínez-Montes et al., 2021). Also, PM2 method can be applied in industries in order to improve their project management, drive their own projects to a successful end with good performance in all fields that PM2 methodology covers during the time the project lasts.

Lucus PB is a particleboard company which foundation takes place in 1970 decade. This company has been working for decades until 2008 crisis. In 2012, Lucus PB closes its activity until 2014 when a big south American company acquires Lucus PB and normal activity of the company can be recovered by 2015. Since 2015 the company has grown in business volume, workers and local impact.

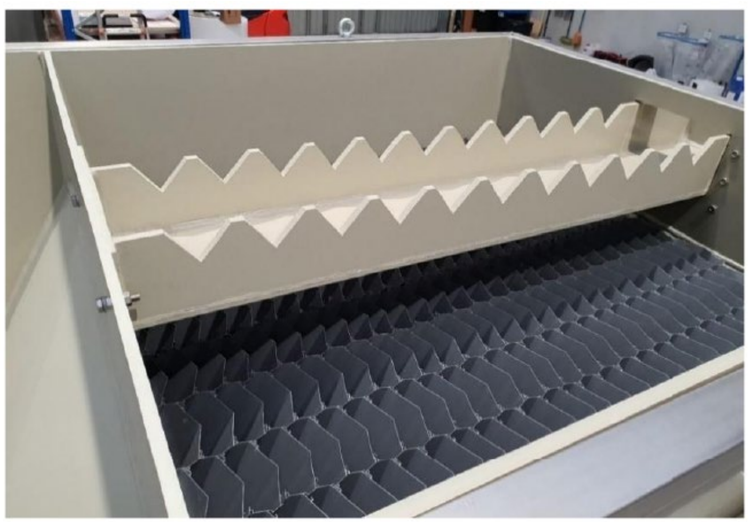
The main objective of the project is to save water in cleaning process.

2. Material and methods

The projected equipment is prepared to save 18,3 m^3 of water per working day, about 5.142,3 m^3 could be saved just recycling the cleaning water. Takin in account a 20% of leak ratio, the expected savings reach 4.000 m3 per year.

In cleaning process water is guided to a decanting settler where wood particles decant to the bottom of the vessel and clean water is discharged to a effluent discharge point. At this point of the process the objective is not saving water but save effluent quantity that is discharged on its discharging point closing the effluent discharge point and saving all the expenses in water control and cleaning the decanting settler (10.000 €/year).

On the other hand, during the cleaning process, sludge is obtained and this sludge can be used on the biomass boiler of the company saving from buying other kinds of biomass.



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3. Results

4.3 Success criteria

- Al least 80% less expenses on cleaning water.
- 2 years of good performance of the plant.
- 50% reduction in water consumption coming from wells compared to 2023.
- Discharge water will fulfill all discharge parameters.

4.4 Scope

The project covers:

- Compilation of action options.
- Compilation and technical assessment of equipment budget.
- Design of necessary civil works.
- Compilation and technical assessment for civil works.
- Channeling discharged water to the cleaning equipment.
- Channeling clean water to the settling pond using the existing stormwater system.
- Proper monitoring of water consumption and discharged water 6 months after installation is commissioned.
- Water analysis system at the outlet (pH and chlorine).
- Adaptation to RD 1215/97.
- Search for a suitable location form the control station.

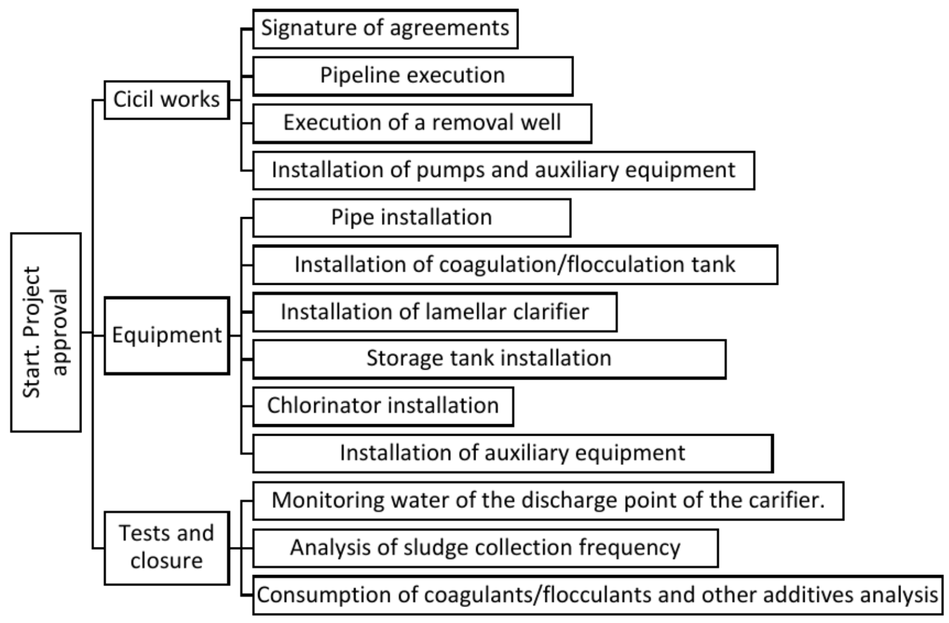
Is NOT covered:

- Sludges transportation to biomass bunkers.
- Wastewater discharging on discharge point should be analyzed 6 months after the commissioning.
- Regular maintenance of equipment.

Table 1: Requirements

	Requirement	Type
1	Suppliers' offers contain all the necessary equipment to implement.	Of solution
2	The maintenance department must verify all needs to make its part of the project.	Functional
3	Documents provided by suppliers will reflect the hole cost of the part of the project they refer.	Of business
4	Suppliers will provide a footprint design	Of solution
5	Offers will reflect delivery time	Of business
6	Offers will reflect form and payment method	Of business
7	The project agreement must reflect penalties for non-compliance by external companies.	Of business
8	Lucus PB will provide of electrical connections	Of solution
9	The civil works offer will reflect the slabs and trenches with all their characteristics and measurements.	Of solution

Figure 2: WBS scheme.



4. Conclusions

As the company is not long experienced in Project Management methodology, PM2 has been received as an easy methodology to start, easy to tailor to the company technicians and to the company reality. Also, this methodology can be developed by Lucus PB through years from a simple methodology that helps to document and manage projects to a more complex system integrated in all departments and being part of the usual management of the plant.