RISK REVIEW ASSESSMENTS

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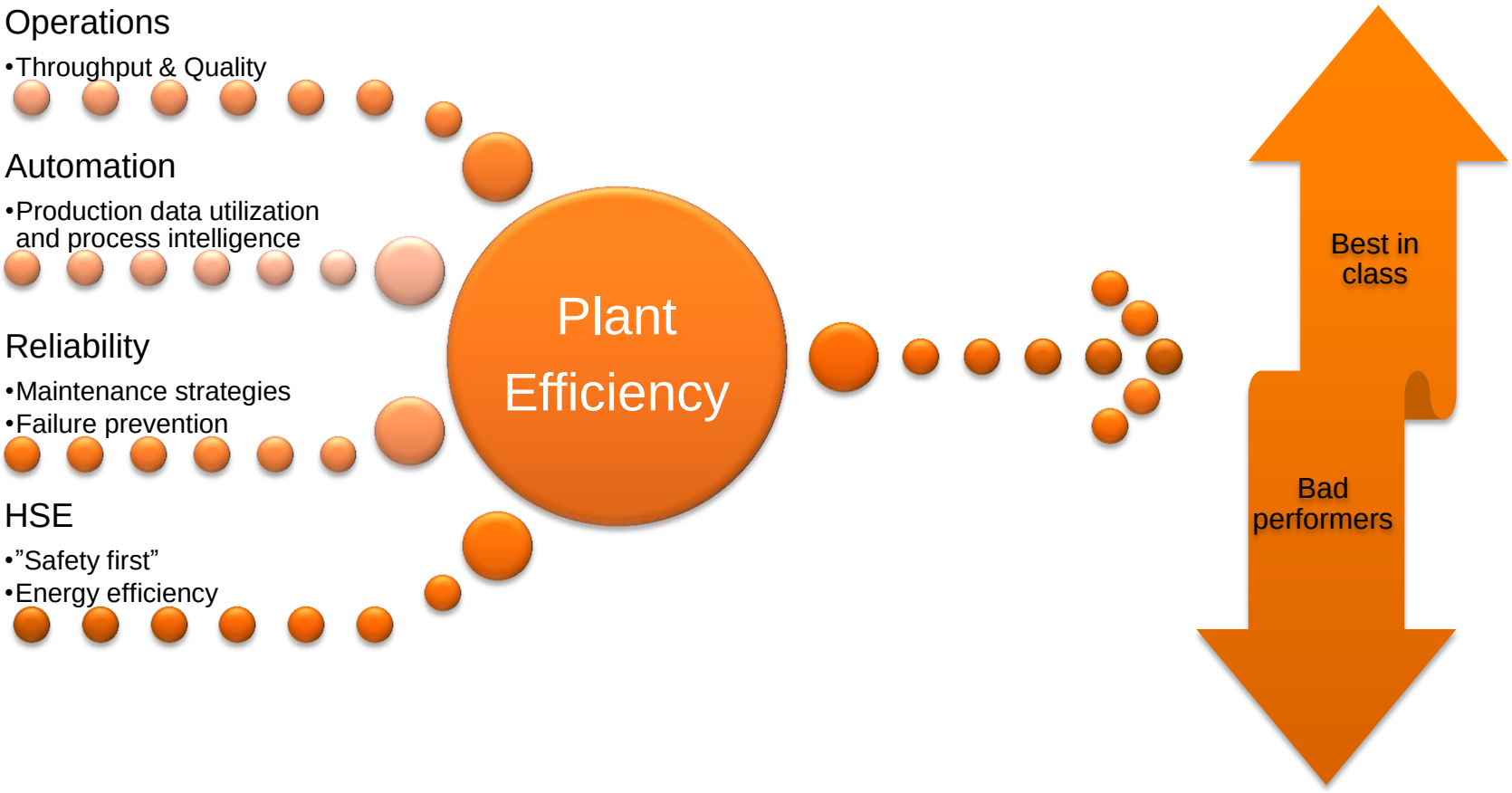
OUTLINE

- Introduction
- Objectives of an risk review assessment
- Methodology
- Deliverables
- Added value – ”Where’s the beef?”
- Case example
- Summary

INTRODUCTION

- General level of investments is still low especially in Europe: focus is shifting into extended life span of technology, operations support in general and smaller-scale improvements
- Mills are constantly decreasing the maintenance and project personnel, causing increased need for external support in many ways to keep up the production efficiency
- Reduction of operating expenses and reduced working capital are among the main drivers of all budgeting for the industry
- Maintenance-related engineering and operations support tasks of different sizes have suddenly become an important single form of support for the pulp&paper industry
- Value components touching investment planning and relationships to operational efficiency are widely discussed
- This presentation aims to give an overview on typical challenges when evaluating the current mill asset base and defining its future. One possible approach (case) is introduced.
- Main findings on the pulp&paper mill risks are reviewed

PLANT EFFICIENCY IS BUILT BY STREAMS OF CAPABILITIES

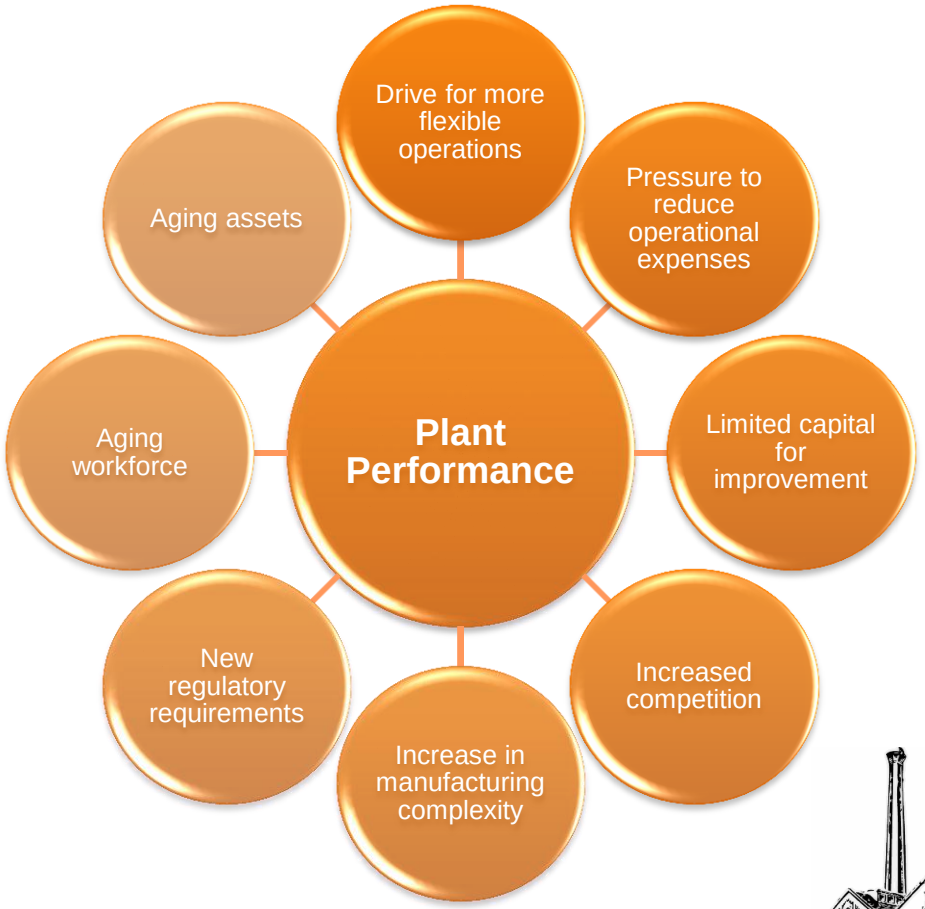


TYPICAL CHALLENGES IN ASSET-INTENSIVE COMPANIES

Financial Markets

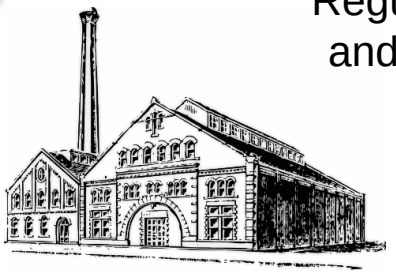
Rise of Renewables

Workforce trends



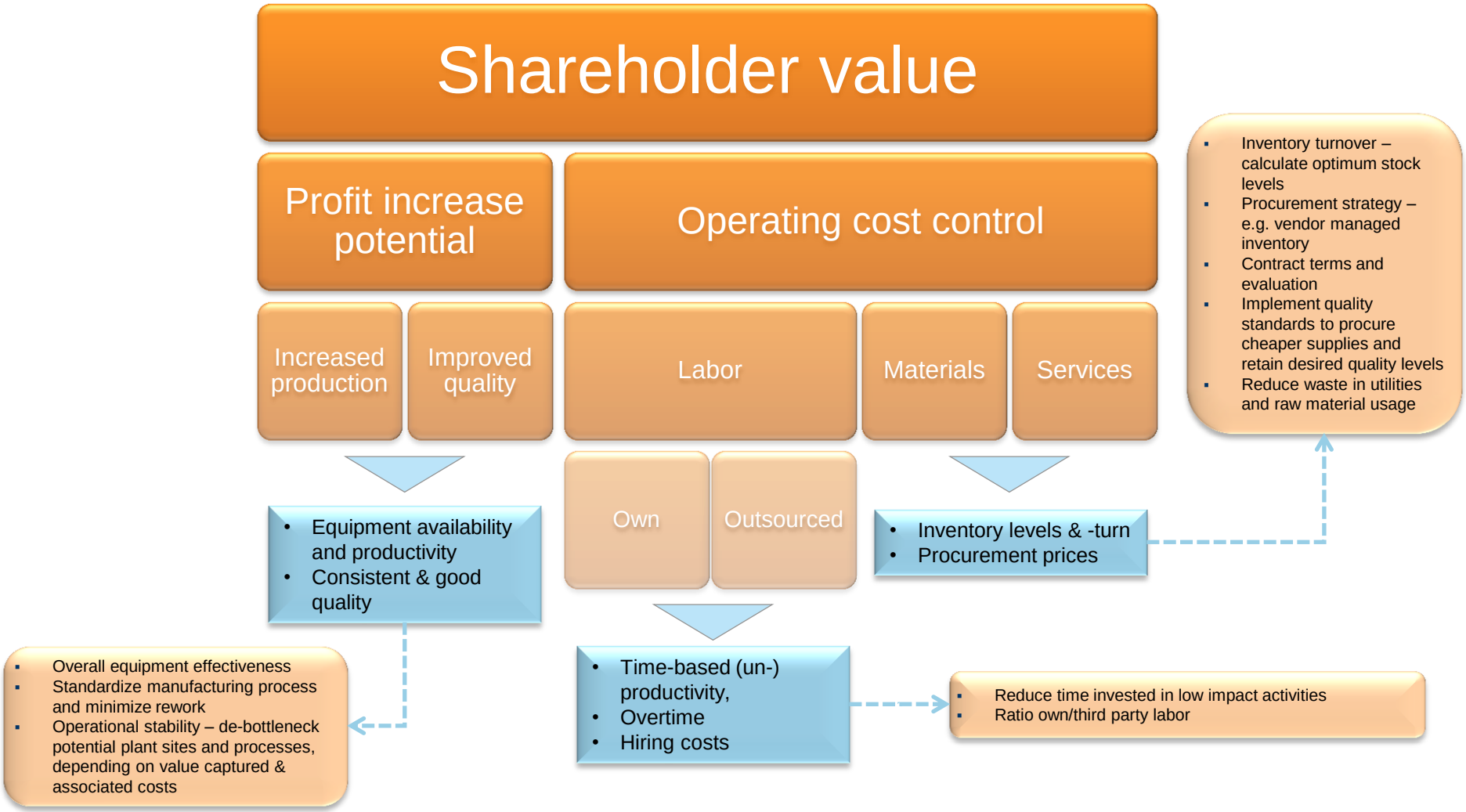
Complexity of Capital Projects

New Regulations and Rules



Aging Assets

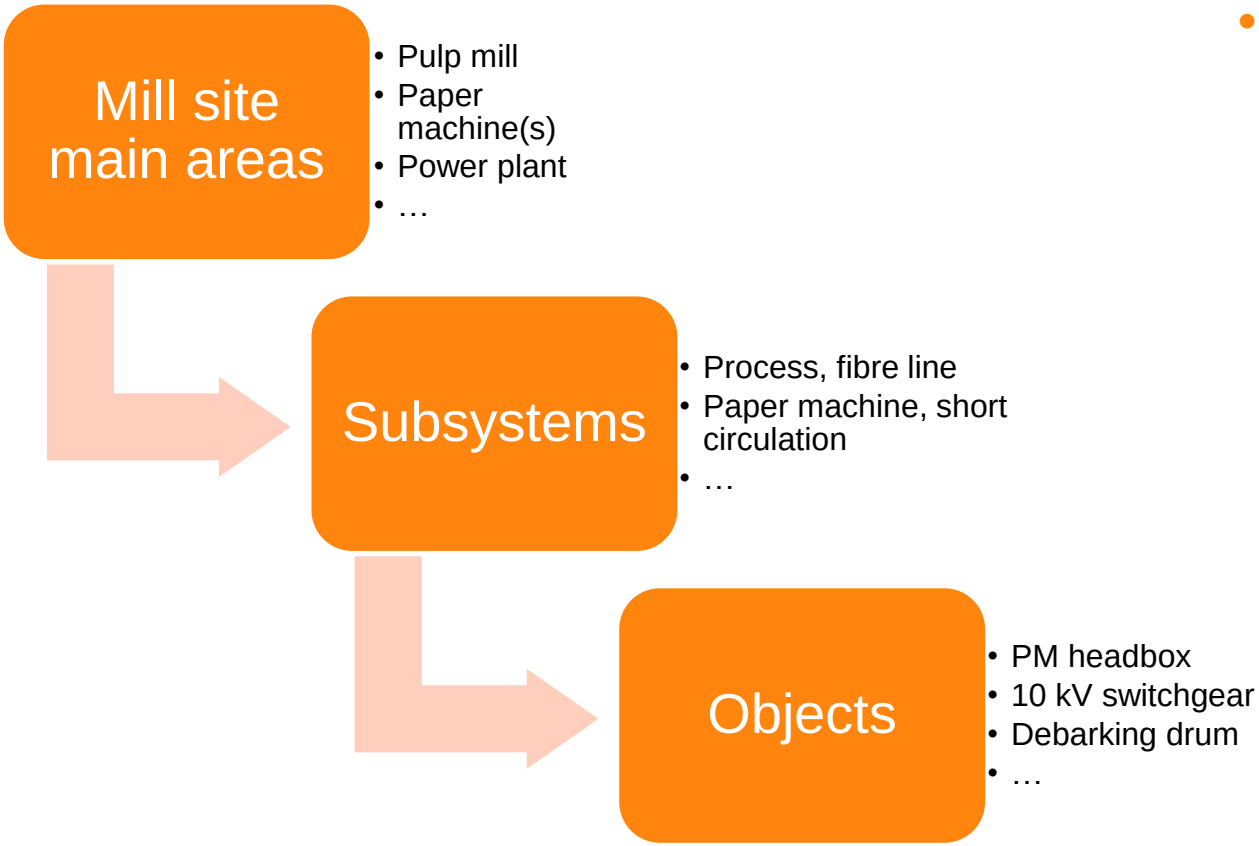
SIMPLIFIED STRUCTURE FOR SHAREHOLDER VALUE COMPONENTS



GENERAL OBJECTIVES OF RISK REVIEW

- Identification of mill main equipment/systems according to specified threshold (X M€) which needs to be replaced within a certain time frame, e.g. within a certain time frame (i.e. cannot be kept in acceptable operation by ordinary maintenance routines)
- Evaluation of risks is based on following criteria:
  - Supplier support availability
  - Age and condition of the equipment / systems
  - Operational reliability
  - Also other criteria can be applied…such as meeting the BAT BREF guidelines, capacity upgrades, HSE legislation etc
- Give recommendations for replacement and provide alternatives for technology
- Understand the offset of OEM design- vs realized operating window
- Provide coarse replacement investment costs , based on files from similar projects (not sufficient for decision-making, but useful for long-term investment planning)

BREAKDOWN TO OBJECTS (EQUIPMENT/SYSTEMS)



- Additional elements:
  - Building condition reviews
  - Mill site infrastructure
  - HAZOP-HSE
  - Debottlenecking
  - Engineering tools development
  - Master data management
  - …

WORK DESCRIPTION

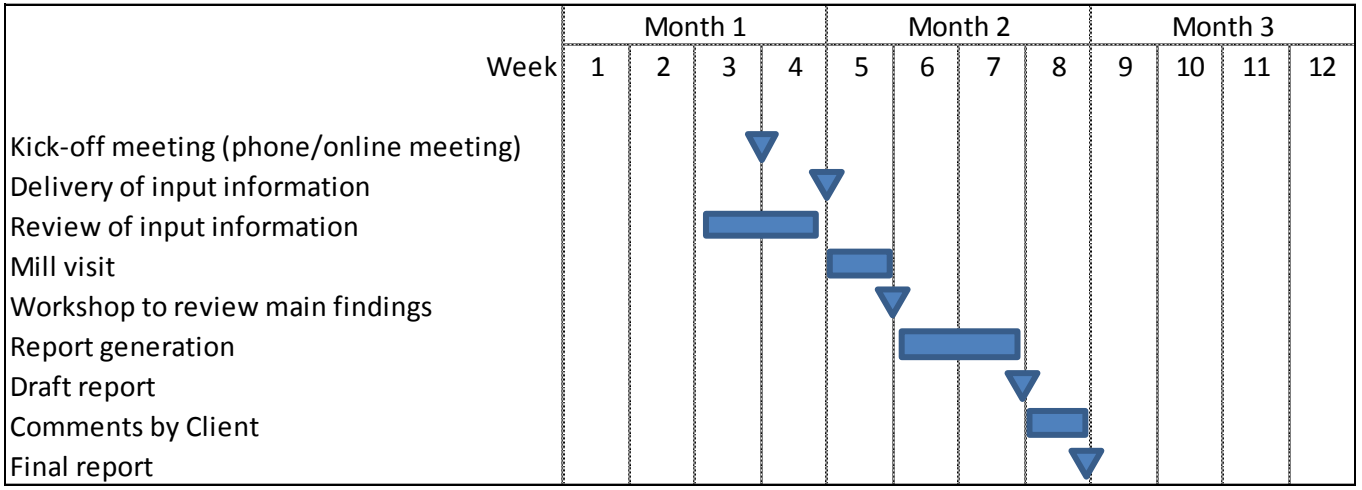
1. Preliminary object breakdown (based on experience and files) and preparation of questions to mills on missing & relevant data
2. Review and completion of the background data, followed by an intensive formation exchange-/data collection phase and review of benchmarks among references
3. Mill visits. Duration of the visits approximately 4 days of site work. The main goals of the visits are as follows:
    1. Verification of the data delivered by the mill
    2. Verification of production data
    3. Review of process concepts and main equipment (type, manufacturer, age, dimensions, mechanical condition, etc.)
    4. Review of maintenance by departments
    5. Discussion with mill representatives about the above items
    6. Inspection of the technical condition of the main equipment for each area by utilising available documentation and personnel experience
    7. Review main reasons for unplanned shutdowns and other downtime

    → Understand the supplier dependency and available supplier support for the objects in scope

    → Understand the risks and lifetime expectancy of the main equipment
4. Reporting of main findings (technical report), indicating the items and related risks. (obsolete items vs capacity limitations)
5. Definition of the main investment objects (based on findings and agreed criteria) – reporting based on alternative technologies and related rough investment cost estimates.

TIME SCHEDULE

- Standard schedule of 6 weeks (regardless of scope)



DELIVERABLES

- The main report includes short descriptions on the main findings, summarizes all critical findings combined with coarse replacement costs, respectively, based on the analyses by applying the defined criteria
  - Technical reports (appendices) contain also all “good news” – most critical items summarized separately
  - Cost summaries for different areas are included, more detailed cost breakdown in appendices
- Suggestions for further clarifications with priorizations
- Preparation of coarse investment numbers for the replacement costs for defined objects have been collected utilising Pöyry files and records for comparable object(s), i.e. no supplier quotations have been prepared specifically for this assessment. However, information from mills is used (if available).

WHAT IS SOLVED? ADDED VALUE FOR CLIENT

- Complementary ”second opinion”; close to 60 years of Pöyry experience available for objective picture about the investment demand for the mill(s) in scope
- Support to strategic thinking, e.g. via implementation of alternative technologies for future production (quality or quantity)
- Understanding the long-term investment demand landscape by correct phasing of necessary investments
- Supplier-independent cost data is made available using Pöyry files and records for costs in multiple reference project for high accuracy
- Recommendations on alternative technological solutions to reduce necessary capex, postpone certain main investments or optimize the repair and optimized level of MRO
- General-level observations for :
  - Identification of potential safety- and working environment – related hazards (e.g. condition of buildings and structures)
  - Maintenance practices (impacting the main equipment life cycle)
  - Operational restrictions and bottlenecks (impacting the future performance level of the objects)
- Provides quick&easy take-off for execution of necessary actions based on observations
- Directly beneficial for the mill; ”forced” review of documentation and essential data

CASE

- 3 mills (pulp&paper integrates) with the same scope, mills in main land Europe
- July 2013-November 2013, all production processes in scope
- Accuracy of the work has been structured to identify either single objects or sub-processes (consisting of several single objects) with total replacement value of > 3-5 M€ at these mills which needs to be replaced in the next 10 years.
- The risk review assessment has been structured to analyse area by area as follows:
  - Process, Pulp (Fibre line)
  - Process, Pulp (Chemicals recovery and Energy)
  - Process, Paper Machines
  - Process, Mechanical pulping (where applicable)
  - Process, Water treatment (Fresh water and Effluent)
  - Electrification
  - Automation
- In addition, general observations have been done to monitor:
  - Maintenance practices (impacting the main equipment life cycle)
  - Operational restrictions and bottlenecks (impacting the future performance level of the objects)
  - Potential safety- and working environment – related hazards (e.g. condition of buildings and structures)

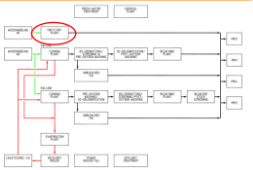
CASE (CONTINUED)

- The specified areas have been further defined into process area – wise blocks by using existing Pöyry files for the specified mills but also close co-operation with the Client has been needed to define all objects and their complexity for breakdown of the work.
- The analysis of the defined objects has been conducted by using Pöyry experience on the age and condition of the objects but also input from mills has been required to fully understand the current state of all defined objects and their operational reliability.
- The criteria, by which the production lines of the mills and chosen objects have been reviewed, are:
  - Age and condition of the defined objects
  - Availability of supplier support for spare parts and services relative to expiration of technology for the defined objects
  - Operational reliability and availability, operating time relative to design window of the defined objects

REPORTING (EXAMPLES)

CONTENTS

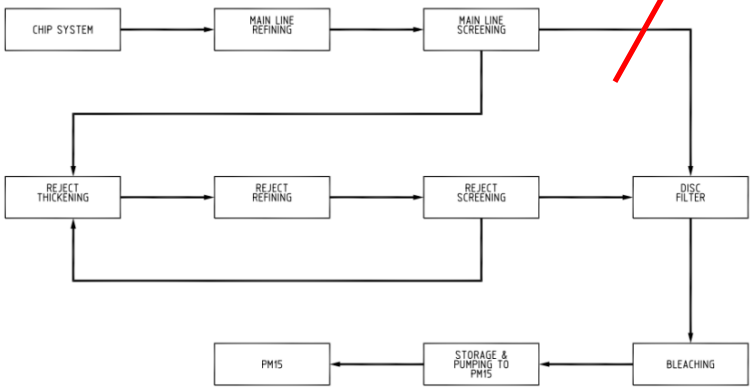
CTMP PLANT



	Supplier	Capacity / dimensions	Installed / rebuilt	Operational reliability	Age & condition	Supplier support availability
Chip system (incl. feeding, washing and impregnation)	Sunds Defibrator	480 ADt/d	1987			
Main line refining	Sunds Defibrator	480 ADt/d	1987 / small automation upgrades on refiners 2007-2010			
Main line screening	Sunds Defibrator	480 ADt/d	1987/ small modernisation of screens rotor by Andritz			
Dewatering / disc filters	Hedemora	240 ADt/d (each)	1987			
Reject thickening	Sunds/Thune	60 t/d (each)	1987			
Reject refining	Sunds Defibrator	480 ADt/d	1987 / small automation upgrades on refiners 2007-2010			
Bleaching & storage	Sunds Defibrator / other	480 ADt/d	1987/ modernization of bleaching system (installation of new pumps and hydrosulphite plant)			

- Concern / requires attention
- Potential / minor concern
- No concerns

CTMP PLANT



MAIN REPLACEMENT OBJECTS

CTMP & TMP plants

CTMP

- CTMP-line should be upgraded to cover the TMP demand, i.e. chip feeding, refiner capacities(upgrades), thickening equipment and screening (including DCS and automatization and instrument control)
- New heat recovery to meet the overall production targets (and to disable the steam demand to PM from the boiler plant)
- Refurbish the steel structures and buildings where needed (not estimated)
- Refurbish / replace the main refiner motors
- Replacement of corroded piping and valves (not estimated)

REPORTING EXAMPLES (CONTINUED)

...e main issue also i...
end of their operational life within 10 years and representing older techno...

Chemical plant

ClO_2-plant building is mechanically in poor condition and suffering from corro... Concrete reinforcements have been repaired. Expertise for the building condi... under progress.

Older ClO_2-reactor mechanical condition is questionable and has requi... work. Expertise checking needs to be done within few years, thou...

Cost Estimate
Summary
- 1000 EUR -

AA = included in Contingency

0 Indirect Costs	1 Civil Works	2 Machinery	3 Piping	4 Electrical Equipment	5 Process Control	6 Painting & Insulation	7 Ventilation	9 Spare Parts	10 Contingency	0 to 10 Total
59	40	540		AA						
82		819								
18	AA	180		AA	AA					
128	AA	1 260	AA	AA	AA					
		320								
20		1 800							300	2 120
100	AA	2 400	AA	AA	AA	AA	AA		200	2 700
70	AA	2 000	AA	AA	AA	AA	AA		100	2 170

Basis of Estimate

...he ballpark investment cost estimates for the main re...
...e are mainly based on Pöyry's cost file information ...
...ement costs are also partly evaluated using supplier quotation... where applicable).

...es are complete investment costs including the cost for civil ...
...ing, electrical, automation, HVAC, spare part and indirect costs. ...
...ude project engineering, project management and administration, site ...porary facilities.

...d in EUR.

...vel in 4th quarter, 2013.

PÖYRY

3.3.3 Mill XYZ

Area	MEUR *,**
Process, Pulp (Fibre line)	
Brown stock-operations	0.5
Fibre line, bleaching	5.0
Drying machine	6.5
Process, Paper machines (finishing)	9.0
Automation	1.4
GRAND TOTAL	22.4

* Non-obsolete objects costs included in this table, see Appendices IV-VI for details

** ...with the alternative having the lower cost (where applicable), see Appendices IV-VI for details

Unit Costs for Replacement

Following indicative unit costs can be applied for the mills (where applicable). The costs are replacement costs, i.e. comparable to new buildings. Final cost levels depend on many factors, such as complexity of layout and possible soil works etc.

...or replacement	EUR
...Cooking & fibre line)	1400/m²
...Paper machines)	1500/m²
...Drying plant)	1700/m²
Buildings (Turbine plant)	
Buildings (Recausticizing)	
Overpressurization of rack rooms	
False ceilings*	
Steel structures**	

* False ceiling unit pricing ...

** Ste...

SUMMARY OF FINDINGS IN THE CASE EXAMPLE

- Generally, core process main machinery is usually in good mechanical condition – at least the main risks are known and corrective actions are planned by the production&maintenance personnel!
- Clear offset in design-/operating window in older process areas
- Different generations of process automation and electrification infrastructure solutions a clear risk as spare parts and other OEM support is not acceptable for all details
- Mills have generated very creative overall solutions to measure and maintain good production levels
- Reluctance to external, non-mandatory inspections (e.g. digester material thicknesses)
- Maintenance practices colourful – no clear understanding on responsibility matrixes at mills
- No clear investments and intentions to increase the maintenance practice maturity
- Ageing workforce and retirements, combined with (usually) poor MDM principles, form together a risk for sudden investment needs
- In best cases, more than 100 years old equipment parts are still in operation!

SUMMARY

- For successful assessments, it is utmost critical to receive high-quality information from mills quickly!
- Risk review projects enable close co-operation for investment planning together with mills and also possibly suppliers
- Extended equipment lifecycle of great interest, as global economy and strategic planning in general is unclear -> equipment rather worn out than refurbished too extensively.
- Occupational safety and accident mitigation underlined everywhere
- Risk Review is not an ordinary DD
- A lot can be done with limited travelling
- Workshop reviews beneficial for all parties at all levels
- Improved agility to start latter phases of investments
- Easier MRO optimization
- Reasonable cost – reasonable time required by the assessments

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