Executive Summary

Relocation and refurbishing of machinery has become increasingly common over the last few years. With market conditions becoming more difficult, companies have been forced to adjust capacity with demand at an unprecedented rate. As a result, more equipment is being taken out of service or relocated to another mill. Valmet has extensive worldwide experience in equipment relocation and refurbishing, with specialized tools and methods to assist at each stage of the process.

Valmet offers a comprehensive package of equipment disassembly, logistics, refurbishment and reinstallation to North American pulp and papermakers - and can do as much or as little as needed. The three case studies and wide range of services described in this white paper illustrate the need for preparedness, flexibility, proper tools (including Valmet’s proprietary Asset Tracking Tool) and expertise.
Market conditions have been difficult for North American paper producers. Companies have been forced to adjust capacity with demand at an unprecedented rate. As a result, there has been a large number of machine/mill closures in North America, with equipment being taken out of use and/or relocated. At the same time there is a serious knowledge drain in the industry due to the departure of a large number of experienced employees.

Over the years companies have looked to Valmet when they needed to relocate equipment. During the execution of these projects we have observed a number of recurring issues.

- Not everything was where it was supposed to be.
- Not everything was what it was supposed to be.
- Not everything was as per drawing.
- Not everything had a drawing.
- Only the "chosen few" knew what to look for.

As the age of equipment increases, generally these issues worsen. Over time equipment gathers dust, becomes lost or forgotten and experienced personnel leave the mill.

Valmet has been an OEM equipment and rebuild industry leader for over a hundred years so refurbishing existing equipment is nothing new for us. We recognize mills’ increasing need to entrust the entire machine relocation and refurbishing (MR&R) process to a trusted partner.

Valmet offers a comprehensive package of equipment disassembly, logistics, refurbishment and reinstallation to North American pulp and paper makers. Valmet can handle as much or as little as needed, including:

- disassembly supervision with asset tracking;
- disassembly labor, tooling and materials;
- shipping and transport logistics;
- equipment refurbishment and shop testing;
- installation supervision;
- installation labor, tooling and materials; and
- start-up, commissioning and training.

**Refurbishing existing equipment**

Regarding refurbishing, Valmet will perform thorough component inspection and replacement as per the original detailed drawings. It is our standard practice to provide new painting, machine wiring and piping for all refurbished assemblies. At your request the equipment can then be fully assembled to test fitment, prewire and pipe as per original supply and allow for your onsite review. Naturally, we provide dedicated project management throughout the lifecycle of the project.

Valmet facilities are large enough and tooled correctly for machine refurbishment and assembly. We have experienced assemblers, inspectors and painters as well as on-site engineering and support staff. We are in
close proximity to and, as a major industry supplier, have good working relationships with all needed subcontractors and suppliers.

We can complete machine inspections prior to disassembly, which will prevent costly surprises that may otherwise not be found until reassembly. Our equipment-specific knowledge helps prevent equipment damage during removal and transport. Our installation supervisors are the same personnel who supervised the disassembly. And of course our professional hands-on and classroom training is available in varying scopes to accommodate your specific needs.

**Relocating assets**

In addition to our vast experience in refurbishing equipment, we have also relocated sections, such as winders and calenders, as well as entire machine lines. We have good working relationships with contractors throughout North America allowing quality local-supplied labor. We have extensive experience with mechanical, electrical and piping contractors ensuring quality installations. Valmet works closely with the mill contracted engineering firm to complete civil and structural modifications and we supply field engineering drawings as needed for installation.

During recent equipment relocation projects and through observations, we recognized the need for a tool to address the issues of inaccurate equipment storage labeling and location, missing or mismatched drawings and knowledge disappearing with employees. This new tool needed the ability to:

- properly inventory the assets,
- easily track the assets during the moving/storage process, and
- simplify and shorten the installation of the assets, particularly for upgrade projects.

So Valmet developed an Asset Tracking Tool ([Figure 3](#)) to aid in the relocation and refurbishment process for North American pulp and paper makers.

**What is the Asset Tracking Tool?**

Working together with the mill for all steps in the process, we start by establishing the disposition of the idled equipment. We then customize the tracking system software, which is site specific for each mill, and then select the people who will execute the program.

Valmet can handle all aspects related to the disposition of the equipment, starting with establishing the inventory of equipment at the given site. We will share the information relating to the idled assets within
the company and outside the company (if desired) for potential buyers who wish to relocate the equipment. We can then manage the relocation of the assets to another site.

The Asset Tracking Tool
A handheld computer (Figure 5) is carried by each service rep and is used to scan and generate barcodes, enter field data and take photos. It contains all assembly BOM data and communicates wirelessly with the label printer. The printer is located on a cart near the person entering label information and prints all tags.

Every assembly and each container are accurately tagged (Figure 4). The tags include all relevant information along with photographs.

During all of these steps we use our OEM knowledge of equipment. For example, in Canada about 80% of the equipment is of Valmet manufacture. We have the OEM knowledge and documentation to significantly lower the risk and stress of your next relocation and/or refurbishment project.

The remainder of this paper demonstrates Valmet's capabilities in the area of machine relocation and refurbishing. The three case studies reviewed will illustrate different combinations of relocation and refurbishment, and cover the standard methodology used by Valmet's MR&R experts.

Case Study: Disassembling and storing an entire paper machine line
The first case study is of the removal of a Valmet paper machine installed in 1998. The mill had been shut down since 2005 and there were no longer plans to open the mill at some future date. By 2008, the mill was down to a bare-bones off-site engineering staff of ten people. Corporate wanted to get the machine (Figure 6) and assets off the books.
at the current location. Their plan was to move this relatively new machine line to one of their southern USA mills, where they had plans to begin manufacturing fine paper.

Corporate contacted Valmet for assistance. They needed expert supervision of the project in order to make sure that equipment wasn’t lost, either due to mislabeling or poor packing. They also felt more comfortable putting the project in the hands of an OEM who knew the papermaking process and all the equipment involved.

Putting the Asset Tracking Tool to work

Within six weeks from receiving the PO, Valmet experts arrived onsite with our proprietary Asset Tracking Tool including software configured for the mill and all needed onsite equipment. Internal Valmet Field Service personnel had directed the development of the tool using their decades of startup and refurbishing experience. They were all too familiar with the chronic problems of equipment that was shipped or stored incorrectly and arrived missing critical parts. The Asset Tracking Tool was developed to eliminate any avoidable shutdown problems due to logistics. During this six-week period the project plan had been proposed, modified and solidified between Valmet and the mill.

Multiple supervisors = no missed parts

Upon arrival Valmet experts proceeded to supervise disassembly on a time and materials basis. The mill made the decision to use two supervisors in order to do the work in a timely fashion. In that way work could proceed at the dry end and wet end simultaneously, working toward the middle of the machine. During the eight months of the project a supervisor was always available to keep eyes on the project so that nothing was missed. Valmet could barcode and inspect items as they were taken out, rather than holding up work waiting for inspection and documentation.

The Valmet experts were both paper machine erectors, each with decades of experience in the field. Work proceeded on day shifts only, with a mill-provided crew of all trades. At the peak of disassembly there were 100 workers.

As each element was pulled from the machine, Valmet personnel tagged, photographed and visually inspected each subassembly (Figure 7). Then they directed the packing into carefully labeled crates with suitable protection for sitting outside for long periods at a mill site near the sea.
As part of the inspection a number of problems were discovered (Figure 8); most common were corrosion issues as well as miscellaneous missing items that would prevent the machine line from starting up easily. This was all detailed in a report itemizing all missing, broken and needs-to-be-repaired items which was issued upon project completion.

The project turned out to be a safe job, with no lost time injuries. Valmet and mill-provided personnel worked well together in a non-rushed environment. They took the time to do the job right – in this case, eight months of day shifts.

Mill corporate took care of shipping all containers to their mill site in the southern USA where the equipment was stored in the wood yard in crates.

Key success factors in this project included the Asset Tracking Tool for careful documentation of the equipment; employment of two supervisors so there were always eyes on the project; taking the necessary time to do the job right; and packing the equipment to withstand a corrosive sea-side environment.

**Case Study: Removing, shipping and reinstalling a soft calender**

In 2008, Valmet was contacted by the corporate engineering division of a paper company to discuss rebuilding a non-Valmet soft calender on a Canadian paper machine line. When it became apparent that Valmet had the capability to disassemble, transport and reinstall the calender, the client realized they now had more options available to them.

**Relocation and reuse presents a good business opportunity**

The Canadian mill had rarely used the relatively new soft calender after its initial installation. Another of their mills in the southern USA had need of a soft calender and had already gotten approval from corporate to buy one. The trims of the two machine lines were similar, so discussions with Valmet naturally moved in the direction of reuse of existing equipment. The Canadian mill ended up bringing in a used calender that better met their current grade structure. Then Valmet was engaged to handle all aspects of relocating the soft calender across the border.

**Dual-language capability was a crucial success factor**

Two weeks after the PO was received from the paper company, Mr. Pierre Fornier, a French-Canadian Valmet erector, went onsite to handle the project. In a very aggressive shutdown, Valmet supervised the disassembly and storage of the soft calender on the mill site in Canada. There was only a two-week window to get the calender out of the mill. All the OEM manuals and drawings were in French so having a dual language speaker was critical. (Pierre was also the main erector for the calender when it was reinstalled stateside.)

**Early choices had impact much later in the process**

On the negative side there were a couple of issues that came back to haunt us later. The mill did not choose to use multiple supervisors and didn’t have the time to get the necessary bill of materials.
information to Valmet to enable use of the Asset Tracking Tool. As a result, Pierre had to label items by hand. This, combined with the large crew supplied by the mill for disassembly, resulted in some problems. There were too many people working at the same time to personally supervise. Some items were inevitably damaged, lost or contaminated during the removal process. Disassembly, inspection, tagging and documentation took less than one week – a very aggressive process.

The calender equipment was packed with minimal environmental protection as the equipment was due to be installed almost immediately upon delivery. Equipment was transported in two shipping containers and seven flatbed truck loads. Valmet handled all logistics including bill of lading, shipping documents and customs duties to get it across the border. The calender was shipped to the USA mill in about a week.

**Major delay in the project**

Unfortunately the company’s plans changed while the shipment was in progress. The startup was cancelled and the equipment sat idle on the southern mill property - under roasting sun, in humid salty ocean air and freezing rain conditions.

After resolving the company issues almost a year later the USA mill was now ready to install the soft calender. Mill personnel preferred Valmet as the installation vendor rather than the original calender OEM. They thought Valmet brought more machine-wide installation and startup experience to the table than the competitor. They also liked the Valmet product group’s proposed rebuild scope and timeliness.

**The Valmet team assembles**

Valmet mobilized our own crew of erection experts to reinstall the soft calender in the southern USA mill in late 2009. Valmet mechanically installed the calender while piping and electrical was supplied by the mill contractors. The reinstallation was part of a larger project involving threading (the largest FoilForce system to date), automation and reel relocation. Thus the multi-disciplinary Valmet team came from many divisions including: Appleton, WI; Beloit, WI; Norcross, GA; and Rautpohja, Finland. There were actually two simultaneous projects coordinated by Valmet. Kurt Dietzen (Project Manager, Valmet Appleton) managed the capital rebuild including roll rebuild and refurbishing to make the calender function as now required. The other project was a service project managed by Pat McCann (Project Manager, MR&R) for reinspection, removal from packaging, assembly and startup of the calender.

At this point Valmet knew of some equipment issues to be resolved due to the disassembly report generated by Mr. Fornier. However, when the calender was re-inspected onsite in the USA, it was found that the minimal environmental protection while packaging combined with sitting outside for a year had resulted in more corrosion issues. Thus more refurbishment was needed along with some replacement parts.
Critical work done ahead of time

In order to save time the soft calender was assembled in the machine aisle (Figure 10) before the machine shutdown, a common Valmet practice. Meanwhile, some of the rolls were sent to a nearby Valmet roll shop to be refurbished; yet another unique single-source possibility for the client as Valmet has a worldwide network of roll shops.

Spare parts were almost nonexistent for the soft calender. Valmet personnel had to read valve stamps and find a domestically available replacement for critical parts since this was a European-built calender. Most of the spares re-sourcing was accomplished during prework.

The reel was originally sitting where the calender needed to be. Prior to the outage, while the machine was running, Valmet installed base plates (Figure 9) and other mechanical items. So during the outage it only took a couple of days to take apart the reel, reinstall on new base plates further downstream (Figure 11), shoot and align it and get it back working. Before installing the soft calender Valmet installed new calender base plates to fit over the existing old reel base plates. This provided a more stable longer-lasting foundation.

Inevitable issues had to be overcome

During startup it quickly became apparent that the soft calender wasn’t functioning as designed. There was evidence that the soft calender had not performed correctly even while in its original installation. Valmet troubleshooted and corrected some of those initial design and installation issues on the fly before and during startup in the machine aisle. The PLC program was taken from the original Canadian mill’s HMI PLC system. Automation converted the control program and put it into the new mill’s control system.

When startup began another ugly issue raised its head – occurring due to the lack of adequate supervision during disassembly and packaging. The issue wasn’t mechanical but hydraulic; the lines were contaminated. Mechanically the soft calender was now in great condition – but once shutdown began the hydraulics showed problems.

No finger-pointing...

Since it was an all-Valmet project there was no finger-pointing. It was our show. Fortunately two of our best fluids engineers, Dave Fencel and Pat Huisman, were onsite. They determined that although the hydraulics had passed the visual inspection there had been a lot of contamination introduced into the line during disassembly (rags, towels, unusual debris in the lines). This made the startup particularly challenging and memorable.
When dealing with proportional control valves troubleshooting debris is hard to do. The calender would start to load and the tending side wouldn't load as much as drive side. This resulted in a system that faulted out and acted bizarrely. Multiple entire system flushes were required. Many valves were taken out, completely disassembled, cleaned by hand (because there were few spares) and reinstalled. Fortunately some of the critical spares had been re-sourced domestically and were easily field replaceable.

**Successful project, despite hurdles**

All of the aforementioned hurdles occurred and were overcome during the machine shutdown. However the project remained on schedule due to anticipation of these or other potential problems. The remainder of the soft calender startup went well.

According to the Valmet Project Manager, the project's key success factors were the quality and experience of the MR&R team assembled for this job. There were many opportunities for failure, yet due to the combined Valmet and mill team, the results were outstanding.

**Case Study: Reinstalling a stored winder**

Our third case study is actually a continuation of the first case study. After disassembling, documenting, carefully protecting and packaging, and moving an entire fine paper machine line and all offline equipment down to a southern USA mill – the fine paper market tanked. The machine line reinstallation phase of the relocation project was cancelled.

**The Asset Tracking Tool as a company-wide resource**

This opened up new opportunities for the paper company as they proceeded to use and convert the stored equipment to be used elsewhere in this and other mills. Every single piece of equipment had been fully and photographically documented, including inspection report, and available to all mills company-wide in an easy-to-use database.

The southern USA mill decided to convert a line from paper to pulp. The line conversion would be an all-Valmet job. They asked Peter Jones, Valmet Sales Manager, "What of the nice equipment in crates in our wood yard could be reused to make this happen?"

Valmet made recommendations for reuse of some of the items for this project. Using the Asset Tracking Tool it was a much less formidable process than it otherwise would have been. It was quickly determined that the KL1000 slitter section in storage would do the trick nicely as part of the winder rebuild section of the larger conversion project. The slitting devices were newer, the
spreader rolls were of a better design, and the control system was state-of-the-art.

**Refurbishment to better-than-new condition at Valmet workshop**

The slitter section was shipped in the original containers from the southern USA wood yard, where it had been residing for a year, to the Valmet Appleton workshop for refurbishment. There it was rehabbed to better-than-new condition. Over the duration of the project the mill eventually sent most of the winder to Valmet: frames, nip guard, slitter section, spreader rolls, front drum, rear drum, etc.

As items arrived at Valmet, they were taken apart and inspected. If any items needed repair, mill personnel were notified. On a case-by-case basis the mill gave approval for any items to be repaired. At the same time the Valmet product group recommended upgrades to controls, etc., according to the latest Valmet designs, again with mill approval before continuing.

During the inspection/refurbishment stage the Asset Tracking Tool continued to be used many times. We need a spreader roll. How many do we have? How many do we have to order? These are the new style winder drums … let’s see the drawings.

All equipment requiring refurbishment was processed relatively quickly. Everything was taken down to bare metal and repainted. All equipment was repiped and rewired. It was essentially a new machine when it left the Valmet shop. The standard Valmet refurbishment process was followed.

- Receive and check-in equipment (Figure 16).
- Disassemble and inspect equipment.
- Send small items to the inspection department for further review.
- Clean all items.
- Identify all damaged, broken and worn-out items to the mill along with a cost to refurbish.
- With mill approval refurbish selected items.
- If a shop test is needed perform it. (A shop test was necessary for this project due to the significant controls work completed.)

After a successful shop test, the equipment was shipped back to the mill to be installed.
Take the time to protectively package your equipment – it pays off!

Fortunately for the mill they had chosen to have the fine paper machine line packaged very well for long term outside storage. Corrosion and UV damage was kept to an absolute minimum. Otherwise if the equipment had sat out in the yard for a year, near an ocean, the likelihood of easy reuse of any of the equipment would have been very small.

Other success factors included use of the Asset Tracking Tool as a company-wide resource for equipment reuse. The mill also successfully leveraged Valmet’s machine-wide experience for a project that was much more than a simple winder rebuild.

This white paper combines technical information obtained from Valmet personnel and published Valmet articles and papers.

Valmet provides competitive technologies and services to the pulp, energy and paper industries. Valmet’s pulp, paper and power professionals specialize in processes, machinery, equipment, services, paper machine clothing and filter fabrics. Our offering and experience cover the entire process life cycle including new production lines, rebuilds and services.

We are committed to moving our customers’ performance forward.