Capital cost analysis looks at recent and future trends

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A review of economic trends specific to the pulp and paper industry through December 1991 reveals factors influencing the industry into 1993–1994.

This is the third Annual Pulp and Paper Capital Cost Trends produced by BE&K. The study covers four quarters, starting December 1990, and is tailored to accurately identify capital cost trends unique to the pulp and paper industry. The current low rate of capital expenditures in the industry has resulted in a very soft market for providers of capital construction services, materials, and equipment. Most suppliers have reported demand at rock-bottom levels. Although equipment suppliers were hesitant to identify significant price decreases, several surveyed were quick to note that the first projects in the door could expect price cuts from the 1990 and 1991 levels.

A review of past escalation data indicates the current escalation trends are consistent with the economic climate of the mid-1980s, the previous low point in pulp and paper capital construction. Escalation rates in the 2% range during the lean years certainly contrast with the 11% rate experienced during the peak activity of 1988. Since detailed pulp and paper cost data have now been identified for a full economic cycle, the ability to forecast two to three years in advance should be greatly improved.

As the country pulls out of the recession, the low rate of escalation experienced during 1991 is expected to remain low through 1992. Major projects currently under consideration are not expected to upwardly influence costs until sometime during 1993. Although these conclusions are consistent with last year's study, the concern that the rebuilding of Kuwait following the Gulf War posed an escalation wild card was unwarranted. Industrial construction activity in Kuwait has not had a significant impact on domestic construction prices.

Material and equipment escalation continued to drop during 1991, and price variations between different vendors were more pronounced than usual. We attribute this to the soft markets and extreme competition for the projects that are under way. Last year's report indicated that labor costs would decline as overtime costs and travel incentives ended. Although a slight wage increase was experienced, the decline in incentives more than offset the cost.

This year's study includes a comparison to the Purchasing Manager's Index, the impact of exchange rates, and a more detailed escalation forecast.

Basis of study

Representative material and equipment specifications from major pulp and paper projects, plus quantities from a specific project, have been used to define the scope of work and cost distribution. Pricing was obtained for each sample material and equipment item from vendors serving the pulp and paper industry. Labor, indirects, and engineering costs were identified from actual rates experienced in the industry (**Fig. 1**).

Project basis

The project cost model is based on a 300+ in. lightweight coated, world-class facility expansion completed in 1985. Contracting is based on open shop construction using direct hire labor. Labor rates were based on the southeastern United States.

Areas of study included:

- Woodyard
- TMP
- Stock preparation
- Paper machine
- Coating
- Finishing and shipping

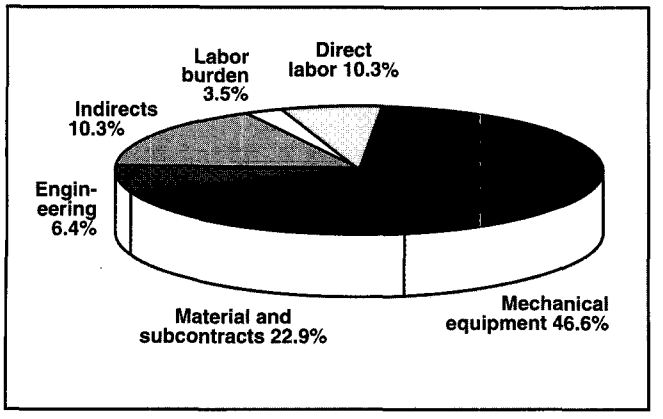
Material selection and pricing

Representative sample items (RSI) were identified using detailed material specifications, purchased quantities, and project cost reports. The RSI quantities and pricing covered approximately 80% of the project material cost. Pricing was updated for 1991. Price updates are obtained by resubmitting detailed material lists to vendors for quotation.

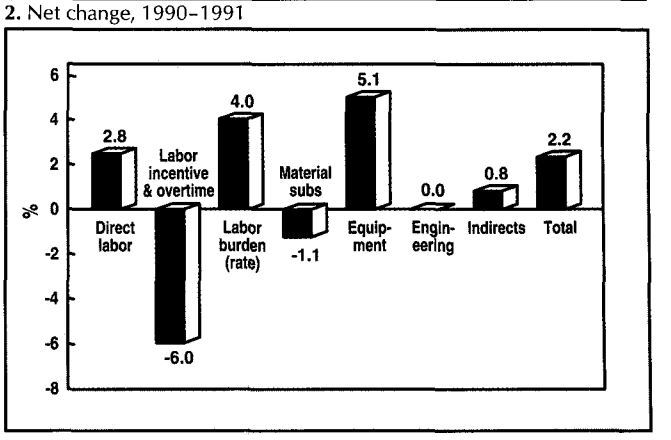
Equipment selection and pricing

Specifications for major equipment components were resubmitted to evaluate and requote for 1991. Representative samples from

1. Total project cost distribution



2. Net change, 1990–1991



general equipment categories such as tanks, pumps, and motors were also repriced in 1991 inquiries. Vendors were interviewed to survey their experiences during the past year and to solicit information regarding future trends.

Cost escalation: 1990–1991

The escalation rate for overall project cost indicated a 2.2% increase over the four quarters covered by the study (**Fig. 2**). This rate of escalation is slightly lower than the 3.0% forecast from last year's study. Actual project experience during the latter half of 1991 found pricing even lower than that obtained for this study. This is a result of select vendors offering very competitive prices in order to retain break-even levels of business volume.

As we entered the second year of declining demand, virtually all suppliers to the pulp and paper construction industry were forced to tighten belts even further. No one area stands out as having significant escalation. Most segments of construction cost are so depressed that our attention is now shifting to the areas where costs decreased. In the 1990 Capital Cost Trends publication, the spotlight was on labor as the cost component with the greatest percentage increase (*Tappi Journal*, August 1991, p. 63).

In 1991, labor wage increases were offset by decreases in premium labor burdens, materials declined slightly, and equipment increased at its lowest rate since 1985. Equipment costs reflect higher costs associated with improved technology, as well as an upward pressure on imported equipment resulting from the continued weakness of the dollar. Equipment costs once again lead the increase in actual dollars and percentage change.

Construction labor

Since the projects funded, designed, and procured during 1988 and early 1989 were constructed in 1990 and early 1991, the construction labor market was at its peak in terms of demand and price. Declining project workloads in the second half of the year stabilized labor markets. Although a modest wage increase of 2.8% was recognized, reduced incentive plans and overtime expenditures prompted a decline of 6.0%. Labor burden (rate for payroll taxes and insurance) increased by 4.0% to 34.0%.

The shortage of skilled construction workers has eased as construction in the pulp and paper industry, as well as other process industries, declined. Competition for resources is expected to pick up during 1993 and 1994 as new projects enter the construction phase.

Materials

Material prices can best be described as bottomed out, following the trends predicted in last year's study. Material suppliers were fairly willing to identify price decreases in most categories, and this accurately reflects trends experienced on recent projects. Fabricators and suppliers also indicate that competition has forced prices down to break-even levels. Overall material prices declined by 1.1% during the year.

Engineering

Engineering costs were also flat as many companies reduced workforce and cut profit margins due to competition for the lower volume of workload. Average wage increases were very low and were offset by additional decreases in profit margins.

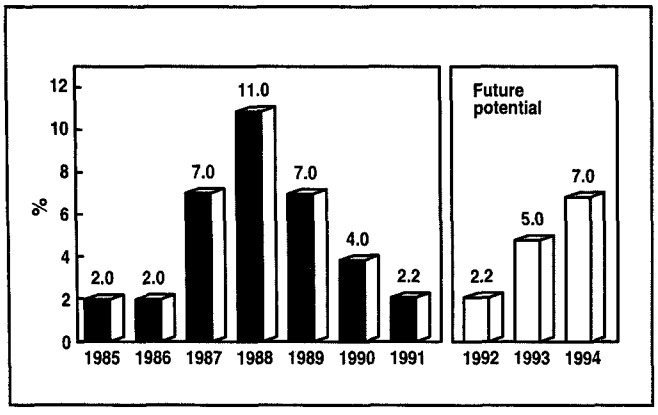
Although the average hourly cost of engineering remains at or below 1990 levels, the introduction of new engineering techniques related to 3-D plant design are effecting a shift in project resources. The 3-D technology is gaining acceptance and is now an alternative method of design on most new projects. This means additional automation costs but, because of reduced work-hours, no overall increase in total engineering cost. This approach should offer total project improvement in quality due to fewer interferences.

Mechanical equipment

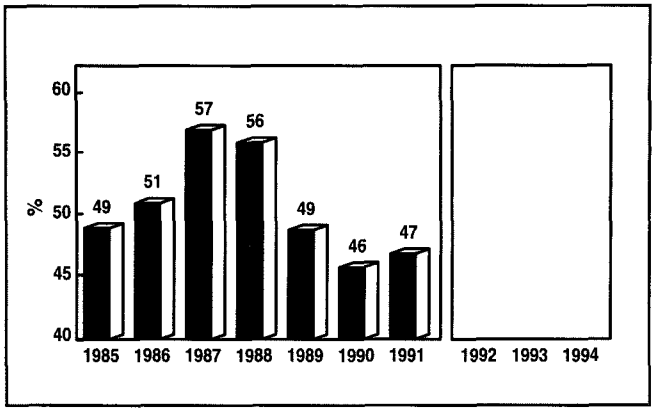
Mechanical process equipment escalation is once again the leader in escalation, in both percentage increase and overall costs. Although the depressed value of the dollar forces prices up on foreign equipment and technological improvements continue to ratchet costs up to higher and higher levels, pricing on current projects indicate that substantial savings can be realized if prices are aggressively negotiated and alternate suppliers considered.

Technological improvements aside, we feel equipment prices

3. BE&K Index showing percent escalation



4. Purchasing Manager's Index (*NAPM Insights*, March 1992)



are actually slightly lower than 1990 levels. Purchase order pricing on recent paper machine rebuilds has fallen well below initial budgeted quotations, lower than the 5% buy-out normally expected. Typical examples of some of the savings companies may experience over last year include:

- Electrical equipment 30% savings
- Winder 14% savings
- Headbox and top wire former 40% savings
- Cleaners 18% savings
- Screens 13% savings
- Agitators 25% savings

Another interesting observation, a comparison to the Swedish krona and German deutschemark, indicates 25% or greater decline in the value of the dollar since 1985; this has forced foreign equipment manufacturers either to absorb or pass on added costs. As one vendor stated, "With the value of the dollar down, we have to fight like hell to keep our prices competitive." The German and Swedish currencies clearly reflect the dollar's slide in value.

Comparison to other indexes

Last year we compared the BE&K escalation index and the Consumer Price Index and concluded that pulp and paper capital costs do not follow consumer price trends. This year we targeted the National Association of Purchasing Management's Business Survey, a report on the general manufacturing economy (**Figs. 3 and** 4). As you will note when comparing BE&K's and the NAPM peaks and lows, the Purchasing Manager's Index (PMI) appears to lead the pulp and paper trend by approximately one year. This may prove to be helpful when forecasting future escalation trends. The following comments are excerpted from the March 1992 *NAPM Insights.*

The NAPM Report on Business is based on data compiled from monthly replies to questions asked of purchasing executives in over 300 industrial companies. Survey responses report the change in the current month compared to previous month for each of eight business indicators measured. The report on business shows the percentage reporting each response (i.e. % higher, % same, % lower), the net, and the diffusion index. The diffusion index includes the percent of positive responses (% higher) plus one-half of those responding same (considered positive). The resulting single index number is then seasonally adjusted using factors from the U.S. Department of Commerce. A chart of the most recent four months' results and a graph of the diffusion index monthly since 1985 present the results. The PMI is a composite index based on the seasonally adjusted diffusion indexes for five of the indicators (New Orders, Production, Supplier Deliveries, Inventories, and Employment) with varying weights applied.

The NAPM indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change and scope of change. A PMI above 50% indicates that the manufacturing economy is generally expanding; below 50%, that it is generally declining. A PMI in excess of 44.5% over a period of time generally indicates an expansion of the overall economy. The distance from 50% or 44.5% is indicative of the strength of the expansion or decline.

The "Future Potential" portion of the BE&K graph is intended to show, based on 1986, 1987, and 1988, how quickly escalation can swing from flat, to rising, to peak escalation rates. Whether it climbs to peak in just two years, or three, or more, remains to be seen. Note that in 1986, 1987, and 1988, escalation rates rose from 2% to 11% in just two years. At this point, we feel that escalation rates for 1993–1994 will be somewhat more moderate, averaging 5% and 7% each year.

Future trends

The low rate of escalation experienced in 1991 directly reflects the low level of capital expenditures in the pulp and paper industry. We expect this trend to continue through 1992 and early 1993. A review of the market trends in the 1980s, from the bottom of the market in 1985 to the peak in 1988, indicates a three-year ramp-up in escalation rates. Following this trend, escalation would remain low in 1992, increase at modest levels in 1993, and peak once again in late 1994 or 1995.

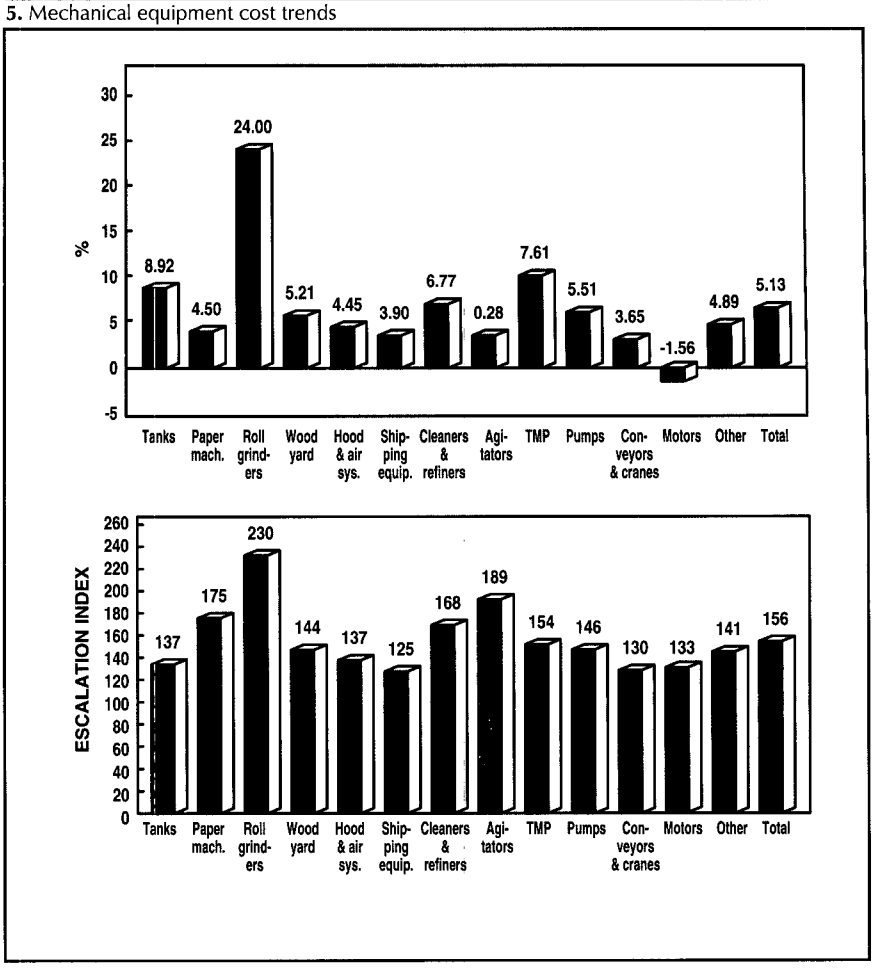
Clients in both pulp and paper and in other industries have projects in the conceptual planning stages that would hit their construction peak in late 1993 and 1994. This simultaneous build-up in capital project construction would certainly have an inflationary influence on project costs. Since prices are at the bottom, there is nowhere to go but up.

Construction labor

We believe the construction labor market will remain flat through 1992 and early 1993. As experienced in the past, the first increases will appear as wage and benefit increases, with additional overtime incentive plans occurring as a second phase. Construction wages continue to remain at unattractive levels relative to the manufacturing sector, and training will continue to be a key element in staffing projects.

Additional programs offering innovative solutions to recruiting and retaining craft construction personnel will be required to staff projects when industrial construction accelerates.

5. Mechanical equipment cost trends



Materials

Although individual material components can be very volatile, the changes in material prices, on average, tend to be gradual. For example, lumber and wood product prices spiked upward with a resurgence in housing, but declined as supply caught up with demand. Generally, commodity materials, currently at rock-bottom levels, should move slightly higher in 1992, while fabricated materials may still have room for further decreases. Material escalation should be minimal in 1992 since no significant increases in demand are expected. As workload builds in 1993 and 1994, material price increases will follow closely behind.

Engineering

Engineering will be the first area to reflect upward pressure on costs since this activity occurs at the start of the project cycle. Engineering costs should be stable through 1992 since new project activity is still at relatively low levels. However, during 1993 we expect upward pressure to occur as newly funded projects enter the design phase.

The increases, when they occur, will be in two primary areas. Wage increases, currently at low or frozen levels, will return to the picture at modest levels. These increases will be coupled with gradually improving overhead and profit multipliers as demand for engineering services increases.

Mechanical equipment

In a competitive, quality-driven process industry like pulp and paper, it is not surprising that technology is the name of the capital projects game. As a result, technology is the one attribute that generally defies economic analysis. In spite of declining demand, equipment prices continue to escalate as technological improvements are added (Fig. 5). This year's relatively low equipment escalation number is attributed in part to the high percentage of retrofit and rebuild projects, which seem to hold down technology "growth" in pricing.

The technology premium, value of the dollar, customer preference, raw materials, labor, and last, but not least, demand, all combine to make mechanical process equipment the most volatile and interesting cost category. In summary, the first orders into the shops can expect very favorable pricing, after that, modest increases. Once the capital valve opens, equipment cost increases in excess of 10% per year can be expected once again. TJ

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