

SURVIVAL OF THE LEANEST



Over the past two years a paradigm shift has occurred in the telecom industry; many companies whose generous spending created expansive, technologically advanced networks now lay nearly in ruins, staggering under the immense weight of operating costs. The build-out of the late 1990s resulted in the construction of massive networks with cutting edge WDM equipment and the latest in high volume switching fabrics.

The theory behind this construction boom was that the insatiable demand of the late 1990's would continue *ad infinitum*, and that the company with the largest infrastructure base

would be able to spread the cost of that construction over the largest number of circuits, thus resulting in a low per-unit cost. Today, with almost daily announcements of bankruptcies and reorganizations, it is essential to re-examine the issue of costs – both operational and capital – as a company's survival may indeed depend on its ability to achieve “lean” Operating Expense (OPEX) and Capital Expenditure (CAPEX) structures. The responsibility for this re-examination must be shared by both network operators and system suppliers.

One of the most immediate ways a system supplier can reduce the costs of system ownership

is by reducing the cost of undersea equipment. This can be achieved in three ways: redesigning equipment to reduce cost (a long lead time solution); using low-cost inventory to satisfy demand (a temporary solution); and/or restructuring manufacturing capabilities to regain lost economies of scale (new relationships among industry players).

The redesign of equipment is a long-term process in which the system supplier examines not only the technical capabilities of a component, but also the effects of that component on other components, system designs, and on-going operating expenses. Today's market requires cost effective solutions based on near term capacity requirements, rather than on long term potential capacity requirements.

The operating cost benefits of a dense, low-power, low-heat SLTE may be more important to purchasers than an SLTE capable of incrementally more capacity. Having constructed the Tyco Global Network (TGN), Tyco Telecommunications has found several areas that impact both CAPEX and OPEX: space consumption; heat production; and power consumption from SLTE, SDH, WDM, and PFE equipment.

In addition, many suppliers are now implementing custom 10Gb/s solutions on systems originally designed for 2.5Gb/s transmission in order to provide additional low-cost capacity.

System suppliers cannot ignore these issues in the pursuit of higher capacity capabilities; they must couple the desire to push the performance envelope with the need to create networks with lower operating costs.

System suppliers have extra inventory on-hand as a result of customer bankruptcies and the re-configuration of planned network builds. This inventory has two major benefits to customers. The most direct benefit is to reduce system cost. In addition, because the inventory can be installed almost immediately, the customer is able to improve their cash flow profile by reducing the time from contract signature (when CAPEX begins) to RFFA (when Return on Investment begins).

System suppliers must also re-align assets, within their own operating units and/or within a larger parent company, and also leverage the inherent strengths of the various industry players to gain benefit from economies of scale. In today's market, the limited demand for system upgrades or new system construction has resulted in substantially decreased production. Without taking advantage of other production capabilities, suppliers will find it difficult to achieve a cost structure that will meet customers' limited budgets.

Tyco Telecommunications has begun this re-alignment of assets in earnest. SLTE manufacturing is being consolidated with another Tyco Electronics company, M/A-COM,

a long-time industry leader in semiconductor, device and component manufacturing. Additionally, Tyco Telecommunications is taking advantage of the reduction in needed cable manufacturing throughput to integrate repeater manufacturing with its cable manufacturing facility in New Hampshire. This integration will reduce costs in the near term and will ensure that Tyco is well positioned for efficient steady-state manufacturing going forward.

A major cost element for which inventory and economies of scale is not the answer is marine installation. Cost effective performance here will be a result of choosing marine assets that are best suited to meet requirements going forward, and of fleet sizing. This requires some crystal ball vision, and visceral "feel", to make some tough decisions. Tyco Telecommunications is redeploying marine assets to size the fleet for focus on cost effective installation and marine maintenance, retaining more modern, cost-effective vessels and installation tools (plows, ROVs, etc.). A common theme that holds true for marine as well as system supply is establishing the right partner relationships within the industry to satisfy the inevitable gaps, both anticipated and unanticipated.

In addition to the changes which can be directly affected by system suppliers, there are several network design changes which can reduce initial construction and long term operating costs.



Marsha Spalding joined Bell Laboratories in the early 1980s after receiving her Bachelor's and Master's of Science degrees in Mechanical Engineering. Her engineering team was responsible for the design, development and introduction to manufacture of undersea fiber optic cables for commercial applications. In the early 1990's she joined the Sales and Marketing division, initiating the Application Engineering organization responsible for designing system-specific undersea architectures to meet customers' project requirements. In the late 1990's she moved to Paris, France where she served as the technical sales director for the Europe, Middle East and Africa regions. Since returning to the US, Marsha has been a key customer account manager and has held positions in both project and product management.

Typically, a submarine system requires that a cable station be located within approximately ten kilometers of the beach landing; because of this, most systems require a terrestrial backhaul route with WDM equipment to interconnect with a customer's Point of Presence (PoP) location located in a metropolitan area. The cost of the terrestrial route can be substantial, both from an initial build-out perspective and as an ongoing operations expense.

Tyco Telecommunications experienced this while constructing TGN and has implemented an alternative solution (Extended Digital Line Section, EDLS). Tyco's approach places Power Feed Equipment and some amplification equipment in a small facility near the landing, while moving all other SLTE and SDH equipment to a PoP, carrier hotel facility, or a cable station which is in a more desirable location.

To get the maximum reach for an EDLS, undersea fiber can be installed, but standard

terrestrial fiber may also be used, providing flexibility and lower up-front costs through lease arrangements rather than new build CAPEX. Because WDM equipment between the cable station and PoP is no longer required and the EDLS is equipped with limited active components, operating and maintenance costs for the terrestrial route are significantly reduced.

The development of Optical Cross Connects and more advanced "intelligent" protection switching equipment allows for the use of mesh network architectures to reduce costs. Traditionally, networks have been designed in standard ring architectures which have total capacities that are two times the service capacity level. Thus, when network utilization approached 30-50%, operators considered increasing their network capacities through upgrades or new builds.

Capacity utilization efficiency can be significantly increased by using mesh protection

technology. Operators can link their networks with mesh protection switching equipment to provide more available paths, and thus more protection options, so that a smaller proportion of the linked network's total capacity needs to be reserved for protection.

The mesh protection approach can profoundly increase utilization efficiency and allow for the deferral of CAPEX for upgrades or new builds. When new construction is warranted, the use of mesh can minimize the cost because a single path, rather than a ring, can be constructed to protect existing capacity and convert it from protection capacity to revenue-generating service capacity.

Economic changes have led to a willingness among competitive network operators to work together to reduce costs. System suppliers must be cognizant of this change and be willing to offer complex solutions that consist not only of new builds and upgrades, but also of capacity as well

The logo for Tyco Telecommunications, featuring the word "tyco" in a bold, lowercase, italicized sans-serif font. The letters are white and set against a dark blue background. A horizontal white line is positioned below the "tyco" text.

tyco

The word "Telecommunications" in a white, italicized, sans-serif font, positioned below the "tyco" logo and separated by a horizontal white line.

Telecommunications

as interconnection and integration with other networks. These solutions can vary from interconnection to other systems for protection or mesh purposes, to inter-working with networks offering extended reach. Tyco Telecommunications can offer comprehensive, integrated global solutions with TGN and system supply. A few other system suppliers have followed suit and are offering similar, regionally focused solutions. System suppliers must work with customers to determine appropriate solutions based on needs and capital constraints.

In addition to linking existing networks as a means to expand a network operator's footprint or for protection purposes, network operators today are presented with a unique opportunity for cost reductions resulting from the sizable network capacities available – consolidation of capacity. Systems such as TAT-8, TAT-9 and NPC all operate at a maximum capacity that is less than 1/10th of the initial capacity of systems that were installed in the past two years.

These systems are capable of continued operation, however the operations and maintenance costs on a pro-rated capacity basis are quite high. For example, an Atlantic system installed in the early 1990s might cost as much \$20-25M per year in O&M expense, for a system with a maximum capacity of less than 10Gb/s.

Consolidation of this capacity onto newer systems can result in dramatic reductions in operating expense.

Since an average 10Gb/s wavelength is now selling for a few million dollars with annual O&M of around one-hundred thousand dollars, a network operator could decommission an older network, migrate the traffic from that network onto a new system, and save an average >99% per year in OPEX. Those network operators who are able to take advantage of this opportunity may realize marked improvements in their operations costs. The trade-off is against the revenues of legacy priced backhaul circuits which are inflated to a point which the present industry conditions are unlikely able to maintain.

In a market where revenues are becoming more and more scarce, network operators must maintain financial stability by reducing operating expenses. The telecom industry is littered with the remains of companies who realized too late that the industry paradigm was shifting, or who were simply trapped by earlier decisions with no effective response.

Companies that are surviving this downturn have recognized the shift and focused resources on the critical priorities of cost cutting. No longer will the company with the largest network footprint, or the most cutting edge technology, necessarily be the dominant force.

We have gone from an era of “super sizing” to one of “counting calories”, and those that are the leanest will survive. Network operators and system suppliers must work together to ensure their survival in this new era.

