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At the beginning, the Electronic Testing Operations (ETO) measured two components of cost: direct labor and burden, but the burden is grouped into a single cost pool that includes all costs and divided by direct labor dollars to obtain the burden rate.

(Q2) ETO’s manager picked up 5 components to evaluate the impact of different accounting system. The reported costs from existing system can be computed as follows, given the burden rate 145%:

Product	Direct Labor	Burden	Total Costs
ICA	917	1,330	2,247
ICB	2,051	2,974	5,025
Capacitor	1,094	1,586	2,680
Amplifier	525	761	1,286
Diode	519	753	1,272

Based on the accounting manger’s proposal, the operation burden can be divided into machine-hour and direct labor burden. We use the revised burden rate 21% and machine-hour rate \$80.1 to show the updated costs:

Product	Direct Labor	Burden	Machine Hour	Machine Burden	Total Costs
ICA	917	193	18.50	1,482	2,591
ICB	2,051	431	40.00	3,204	5,686
Capacitor	1,094	230	7.50	601	1,924
Amplifier	525	110	5.00	401	1,036
Diode	519	109	12.00	961	1,589

If ETO follows the consultant’s recommend, treats the main test room and mechanical test room as different cost pools. The three-burden-pool system reports the cost: (\$63.34 for main room burden rate and \$112.63 for mechanical room)

Product	Direct Labor	Burden	Main Room Hour	Mech. Room Hour	Test Room Burden	Total Costs
ICA	917	193	8.50	10.00	1,665	2,774
ICB	2,051	431	14.00	26.00	3,815	6,297
Capacitor	1,094	230	3.00	4.50	697	2,021
Amplifier	525	110	4.00	1.00	366	1,001
Diode	519	109	7.00	5.00	1,007	1,635

Among the three costing systems, we prefer the consultant’s proposal (Q3). The accounting manager treats the machine hours as separate cost pool because the automated operation process leads to large percentage of total cost comparing to direct labor. Measuring the machine hour costs can help us to assess the total burden more accurate. However, given the same machine hours, the different hours spend in main room and mechanical room also incurs different costs. We can see from Exhibit 5 that mechanical room has higher unit cost per hour. Therefore, the three-cost-pool system can trace the costs back to the actual operation factors more clearly.

(Q1) According to the two explanations shown above, the critical problem that causes ETO to fail is the single cost pool accounting system. In the single cost pool system, all products consume direct labor and overhead in the same proportion. However, some products need more direct labors while others require automated machinery operation. And the trends of direct labor obsolescence also biased the calculation of burden rate, which causes the overall product cost assessment become misleading.

Although we prefer the consultant’s proposal, the three-cost-pool system still can be further improved by introducing another cost pool, the technical support costs (Q4). Both the accounting manager and consultant regard the administrative and technical functions as the same cost factor. However, we think the technical support is very different in nature comparing with administrative cost. Each type electrical component which sent to ETO varies greatly in its complexity. For example, a keyboard IC is much simpler than a 3D graphic processing IC and requires less (or nearly no) technical support since keyboard IC is a matured product.

Administrative cost usually includes general overhead such as indirect salaried employee, security, store/warehousing, telephones, and others. If we classify the technical functions in the same cost pool as administration costs, then a keyboard IC and a 3D graphic processing IC share the same direct labor burden rate, which is not reasonable. Therefore we recommend a four-cost-pool system that separate technical support from general direct labor burden.

(Q5) From the data provided in Exhibit 5 and Exhibit 7, we can calculate the main test room burden rate if the new machine is included. The first year’s burden rate will be:

	Hours	Variable	Depreciation	Other	Total
Old Machine	33,201	887,379	88,779	1,126,958	2,103,116
New Machine	400	100,000	500,000	225,000	825,000
Sum	33,601	987,379	588,779	1,351,958	2,928,116

Machine Hour Burden Rate \$ 87.14 (first year)

And the remaining years’ burden rate:

	Hours	Variable	Depreciation	Other	Total
Old Machine	33,201	887,379	88,779	1,126,958	2,103,116
New Machine	2,400	100,000	125,000	150,000	375,000
Sum	35,601	987,379	213,779	1,276,958	2,478,116

Machine Hour Burden Rate \$ 69.61 (remaining years)

The original burden rate calculated from three-cost-pool system is \$63.34. Both the first year (\$87.14) and remaining years’ (\$69.61) burden rate per machine hour are much higher, especially for the first year. Since the new equipment is only needed by one or two customers in the foreseeable future, we should treat the new machine as separate cost center, or the new equipment will have a disastrous effect on ETO’s pricing structure.