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The Certification of Inventories

BY JOHN WHITMORE

The question whether in certifying the balance-sheets of manufacturers accountants can or can not certify inventories is at present rather frequently under discussion. There is a common clause in accountants' certificates which disclaims responsibility for anything more than the substantial accuracy of the final clerical work of the inventory statements. Very often, doubtless, this is necessary. But where there is really sound factory bookkeeping, and especially where the same accountants examine year after year, I think it ought scarcely ever to be necessary. I believe that under attainable conditions, manufacturers' inventories ought to be about as certifiable as their accounts receivable.

I believe that inventory statements are quite generally thought of as something to be produced by physical inventory-takings, to be adjusted and completed, doubtless, by the book records. Plainly no physical inventory-taking can be sufficient of itself. There is the question of inactive or obsolete goods. This is sometimes a matter of personal knowledge or judgment, but the best information is usually in the records which show the activity or inactivity of materials or merchandise. Again, the correspondence of the point of the inventory-taking and of the recording of purchases and shipments to the inventory date must be established. And sometimes in other respects, varying according to the character and fashion of the industry, the inventory-taking must be supplemented by the records. But where this is all, there remain considerable dangers in the physical inventories themselves, as everyone who has tested them by a strict subsequent accounting knows.

I believe the approximately perfect inventories are book inventories, checked and corrected, certainly, and, where in the nature of things there can not be finished inventories in the books, completed by certain physical examinations.

I have attempted to define cost accounting as the accounting for all expenditures in the creation and operation of manufactur-

ing plant, showing truly and clearly how they enter into the costs of final products, and how and in what measure they are wasted. Where there are cost accounts even fairly aiming at this result, I believe they will, when supplemented by certain limited physical examinations (for the closely approximate testing of which the books and records will always serve), yield true inventories of all materials and unissued supplies, and of everything in process of manufacture or semi-manufactured; and, by the continuation of the simplest methods so far necessary, of all finished products.

Let us look briefly at a few industries, to consider their particular characters, and to see in what ways and how far their books should yield true inventory statements, and in each the character, and the times and seasons of the physical examinations necessary to check or complete such book inventories.

The machinery-manufacturing industries are an important class and they furnish one rather comprehensive test, for their stores commonly consist of thousands of items. Stores ledgers are an absolute necessity to economy of manufacture—that is, they are necessary to the avoidance of the loss of time of both men and machines. That they shall state both quantity and money figures is necessary to any correct costing of materials to manufacturing orders. They practically must include provision for showing the quantities assigned to manufacturing orders pending, for otherwise balances on hand mean nothing. Then the completeness of the bookkeeping must be insured. To insure the entry of all stores issues the shop requisitions should be numbered consecutively by the printer, as many series being used at the same time as may be necessary or convenient; and they should be summed up on sheets with printed provision that this shall be done in the order of the numbers. No requisition unaccounted for can then be overlooked. The recording of deliveries from the shops to storehouse must be similarly safeguarded. The stores debit notes must be numbered consecutively by the printer, and these must be summed up on sheets with printed provision that this shall be done in the order of the numbers. Needless to say, surely, the storehouse or storehouses must be organized for effective physical control, and the general accounts must include control of the storehouse ledgers. Countings should be made throughout the year, and always as particular stocks are low. The storehouse ledger keepers should be provided with a form to call for such countings.

From such stores ledgers an inventory can be drawn off, priced at costs. All inactive goods can be listed, the stores issues in each account for the year being plainly before one. It is seen when each account was last verified by actual count, and by the same routine that is regularly used by the stores-ledger keepers the auditors can call for all actual counts they wish. There may not be an exact balance with the controlling general-ledger account, though this, of course, can be accomplished. It is a matter of frequency of trial balances and checking to find clerical errors. If the work is well done, the less frequent test and the approximate balancing suffice for assurance of satisfactorily correct inventories.

As regards inventories of work in process in the machinery-manufacturing industries, I can scarcely think that, with sound cost accounts, a physical inventory is ever necessary. Orders in process are always being completed, quantities put in process are always being accounted for, the correctness of the values stated is always being brought to the final test. The cost ledgers are of course controlled in the general accounts. The book inventory of everything in process of manufacture should be approximately perfect.

In the metallurgical industries the necessity for controlling the processes is so imperative that usually all the process data necessary for the cost accounting, which includes the current statement of inventories, will be found available. The storage of raw materials may need to be regulated, to give to the records of materials put in process the verification of not too infrequent clean-ups. For it is not suggested that any strictness of recording is to be regarded as giving an infallible assurance, except with all possible safeguards.

In these industries the gross weights and all assayed contents which it is aimed to recover are set up in their separate columns for the materials as received, and thereafter the arrangement of the operating books is like a flow-sheet of the material, from process to process, detailed, according to the conditions, by individual furnaces or other apparatus; and at each process all charges are added, for fuels and fluxes, for electric current in electric smelting or refining, maintenance expense and reconstruction reserves, operating labor and supplies and expense rates, until the final products are reached. Weighings and assayings of intermediate products are brought into the operating books, accounting at successive stages for metal losses and giving the

books all possible completeness and exactness day by day. Such books afford approximately exact inventories, where physical inventories would often be impossible.

It is true that there are at certain points in the metallurgical industries, doubtless more than I am myself familiar with, continuous processes, for instance in certain calcining furnaces, and in concentrating works, where the current bookkeeping will not give inventory statements, except as supplemented by theoretical calculations or by measurements and analyses. This is only what was meant by saying at the beginning that under certain conditions book inventories need not only to be checked but to be completed by data periodically ascertained. This is not abandoning the books to fall back upon physical inventories, for, if the operating records are made as complete as possible from the current daily reports, the supplementary determinations must fit into them, and any material discrepancy would be apparent.

In the chemical-manufacturing industries, the manufacture of soap and the finished production of the glycerine contained in soap stocks furnish first in the soap factory an example of the treatment of stated quantities of materials, with in this case incidental transfers between boilings, through successive processes, to the point where the recorded quantity and value of materials, with the added process expenses, have an ascertained product. So far the whole inventory is always stated in the factory ledger. It is seen there moving through the processes to the final productions of soap for the market, or glycerine lyes for the glycerine works, unsurpassable by any possible inventory-taking process in the accuracy of the statement of quantities and values. And, second, in the glycerine works is an example of virtually continuous processes, where some periodical gaugings and analyses are necessary to complete the records and to state the inventory. These determinations, in conjunction with the factory ledger, yield a complete and practically proven glycerine inventory, for like the metal contents of the materials so treated in the metallurgical industries, the glycerine contents of the soap stocks have been set up in their separate columns in raw-materials records, and in kettle accounts, from process to process, until they are transferred from soap works to glycerine works, and any material overstatement of the inventory in process would show an impossible yield, and any material understatement would show a practically impossible loss.

Where continuous processes preclude the possibility of current completed book inventories, I believe the determinations necessary to complete them rarely, if ever, go beyond those which should be made for the purposes of operating control.

In the writing-paper-manufacturing industry, lots of materials are first treated process by process, and the operating accounts are up to a point of the character already indicated for the metallurgical and chemical industries. At a certain stage, however, the materials in a wet state are divided up for paper-manufacturing orders, having their individual cost accounts. The stores accounts for materials as received are especially simple, the principal materials being in bales, the indentity of which, lot and bale numbers, should be perfectly kept, as in the textile industries. The process accounts give the value of everything that has been put in process, with the accumulated process costs, to the point where the materials are divided up for manufacturing orders. As they are so divided they are charged to the cost accounts for manufacturing orders, and other materials introduced in the subsequent stages of the manufacturing are so charged, as well as all the manufacturing expenses from the point where materials are assigned to specific orders to the point where the paper comes off the machine. Thereafter there are sorting accounts, continuing the record of everything in process until the product is finished. Stocks of finished papers may be a larger or smaller matter, but in any case they present no special problem in the maintenance of verified stock records.

In the writing-paper industry the shrinkages of the various materials in the manufacturing processes should be known by theoretical calculations, by laboratory tests and by manufacturing experience. The dividing of materials in a wet state gives initial inaccuracies in charging the separate manufacturing orders, but these are corrected in the light of known shrinkages and of the several products of the divided materials as the productions are determined, even though a single product may contain parts of more than one or two lots of materials so divided.

The book inventories in this industry also may be of an unquestionable character.

In industries where there is a great variety of products in comparatively small quantities, so that individual cost accounts are scarcely practicable or are really impracticable, a method different from any so far indicated is necessary. The stationery-manufac-

turing industries and the rubber-goods-manufacturing industries are examples; the shoe-manufacturing industry also, especially where many small lots are manufactured. In such industries it may be necessary to credit the manufacturing account or accounts with the products at standard cost figures. If this were all, it would leave all variations from standard costs in the manufacturing account, which would soon cease to represent at all accurately the value of goods still in process. But it is necessary, in order to control the economy of manufacture, to calculate these variations from standard costs week by week and month by month.

It is necessary to set up accounts for the variations, in actual operation, from existing standard costs. There will be such variations under four heads: costs of materials, the unit costs of time-paid labor, expense-rates and percentages of defective products. Materials must of course be charged out of the stores accounts at cost, and if they are also priced in totals periodically at the prices used in the existing cost sheets the price difference one way or the other is ascertained. If the quantities put through each process where the labor is time-paid are recorded, and the weekly payroll for the process is divided by the quantity, the actual unit cost is ascertained and the variation in the cost sheets for the week may be known. As regards defective products, the standard cost of goods at every stage of manufacture is shown by the cost sheets, and the manufacturing account is corrected to the same standards, and the defectives at the various stages, over or under the allowance in the cost sheets, can be priced thereby. The general expenses are ascertained monthly, and comparison with the amounts given by the standard rates, applied usually to the direct-labor payrolls, will give the variation from standard costs under this head.

There remains, however, the question of variation in the quantity of material used for a given product. There will be a somewhat different answer in each industry. In the stationery-manufacturing industries, where the material to be cut for a given product is of uniform size, shape and quality, and an experimental cutting has determined the best method and the proper result, the variations are slight and easily allowed for. In the rubber-manufacturing industries, the variations are larger but not of great importance, for the reason that unvulcanized rubber scrap is practically undeteriorated material, requiring only to be re-rolled. In the shoe-manufacturing industry, where the material to be cut

is of irregular shapes and the scrap of comparatively little value, the usual practice is still to establish cutting allowances and to issue stock accordingly, and to record the cutting gains and losses, lot by lot.

The creation of standards of expense and waste and the constant showing of variations from such standards are the essential means of securing economy of manufacture, and in doing this in the industries under consideration it becomes simple to adjust the manufacturing account to standard costs, and then by crediting the production at standard costs to leave the manufacturing account representing what is still in process at the same standard costs. Further, the office and factory records of goods in process in such industries must afford substantial means of verification.

The great superiority of book inventories is scarcely even in their far greater accuracy of statement. It is in the fact that they can, in any books that truly yield them, be seen in detail in the processes (active and sure, or slow and doubtful, or somewhere between) by which inventories are ultimately converted into cash. Instead of a list of items, there is the moving substance.*

The discussions I noted at the beginning are absolutely relevant in perhaps all cases where the accountants come newly to the concern under examination, and certainly in all cases where satisfactory cost accounting does not exist: but where the auditing accountants have established the cost accounts, or where they are familiar with them and know their satisfactory character, it is my feeling that they should be in a position to verify book inventories or to correct them as this may be necessary, and to certify them with no less confidence than that with which they certify other assets.

* This, for my purpose, very happy expression, I have adopted from a review in the *New York Times* by Evans Clark of Paul M. Mazur's *American Prosperity*—" the moving substance and not a static representation of life."