Overhead allocation for the purpose of inventory valuation at quarter/year-end

The following is the brief version of an opinion given by the Expert Advisory Committee of the Institute in response to a query sent by a member. This is being published for the information of readers.

A. Facts of the Case

1. A company is having a "Continuous Process Plant" producing a single product. The installed capacity, which has been reported in the annual accounts, is 2,000 MT per annum. The actual production has been higher for the past few years, the quantities produced have been in the range of 2,400 MT to 2,500 MT.

2. According to the querist, the company has been consistently following the method of valuation of inventories, viz., finished goods and work-in-progress, by arriving at the cost of production (COP). In arriving at the cost, all the direct costs are considered and the fixed factory overheads are allocated on the basis of actual production. It is also considered whether the cost is greater than net realisable value (NRV) or not.

3. During the first quarter ended June 2005, the plant was shut down for 21 days for planned maintenance and later during the quarter due to a break-down for a period of 6 days, thereby the effective working days during the quarter were 64. The actual production during the first quarter was 340 MT.

4. The querist has stated that during the course of the company's internal review, a view was expressed that since the plant has produced 340 MT during the first quarter, and the normal quantity produced over the past few years is about 2,400 MT, and recognising that the quarterly accounts must follow the same principles followed as at the year-end, there is a need to quantify the production capacity on a quarterly basis. The suggestion was to do the pro-rating of the capacity over four quarters. The base figure so arrived is 600 MT per quarter. Considering the quantity actually produced, i.e., 340 MT, a view was that the fixed overheads to be inventorised on the closing stock should only be to the extent of 56% (340/600) as per Accounting Standard (AS) 2, 'Valuation of Inventories', issued by the Institute of Chartered Accountants of India, and the balance 44% should be charged off as an expense and should not be inventorised. In this connection, the querist has drawn the attention of the Committee to paragraph 9 of AS 2, as given hereunder:

"9. The allocation of fixed production overheads for the purpose of their inclusion in the costs of conversion is based on the normal capacity of the production facilities. Normal capacity is the production expected to be achieved on an average over a number of periods or seasons under normal circumstances, taking into account the loss of capacity resulting from planned maintenance. The actual level of production may be used if it approximates normal capacity. The amount of fixed production overheads allocated to each unit of production is not increased as a consequence of low production or idle plant. Unallocated overheads are recognised as an expense in the period in which they are incurred. In periods of abnormally high production, the amount of fixed production overheads allocated to each unit of production is decreased so that inventories are not measured above cost. Variable production overheads are assigned to each unit of production on the basis of the actual use of the production facilities."

5. The querist has interpretated from the above paragraph of AS 2 that the period of planned maintenance is to be excluded in arriving at normal level of production. Accordingly, the actual days of planned maintenance have been excluded (21 days), thereby reducing the "base" quantity from 600 MT to 461 MT (600*70/91 days). Thus, allowable overheads for inventory valuation based on available capacity utilisation works out to 74% (340/461).

6. The querist has further expressed his view that in arriving at the normal level of production, if the period of break-down is also to be excluded as per cost accounting principles where allowance is given for unavoidable interruptions, like time lost for repairs, inefficiencies, breakdown, inventory taking, etc., the period to be considered reduces to 64 days. As per the querist, the base quantity of 600 MT will get reduced to 422 MT (600*64/91 days). Allowable overheads for inventory valuation based on available capacity utilisation works out to 81% (340/422).

7. The querist has stated that the company in question has never followed this method of identifying the actual production against the rated production for the purpose of inventory valuation and while the company might have been producing about 600 MT per quarter, a so-called "normal production" had never been bench-marked by the company – definitely not quarter-wise.

8. According to the querist, there was also a view that this issue gets highlighted where there is a shortfall in quarter one. In quarter two and quarter three, the cumulative throughput normally brings the average to an acceptable norm. As per the querist, the question that needs to be addressed is whether this rule is to be for a particular quarter or for the cumulative period.

9. As per the querist, financial impact of the treatment recommended as above would have a bearing in the particular quarter where there is a reduced production as the overhead cost that is normally inventorised would be lower, thereby impacting the bottom line. The next quarter's opening stock would, to that extent, have a lower carried forward unit rate. This inventory when sold would generate a higher margin. However, if the under-absorbed overheads for a quarter are frozen and not to be considered for the year-end valuation and unallocated overheads are recognised as an expense in the period in which they are incurred, then the year-end stock valuation process will not consider this amount and to that extent the year-end value of stock will be lower. The querist has stated that since the year-end carry forward stock levels are high, this also impacts the year-end profitability.

B. Query

10. The querist has sought the opinion of the Expert Advisory Committee on the following issues arising from the above:

    (a) Paragraph 9 of AS 2, inter alia, states "actual level of production may be used if it approximates normal capacity". At what percentage of production over each quarter would trigger the application of this Standard? Is it 50%, 60%, 75%, 80% or 95%?

    (b) Whether the normal level of production for each quarter is to be arrived at on the basis of equal production for four quarters. Is this a reasonable method for determining the capacity utilisation (refer paragraph 4 of the 'Facts of the Case')? In the case of the company under consideration, the main demand will be during the third and fourth quarters and it is expected that the normal production level of about 2,400 MT will be achieved in the current year. If this be the case, what is the treatment to be given for the first quarter's lower production?

(c) Whether this rule is to be for a particular quarter or for a cumulative period?

In case the actual production in the first and second quarters are assumed at 600 MT and there is a fall in the third quarter to 340 MT as illustrated below what would be the treatment:

Expected Annual Production	–	2,400 MT
Pro-rated production per quarter	–	600 MT
Actual Production – first and second quarters	–	1,200 MT (600 MT each)
Actual Production – third quarter	–	340 MT
Cumulative total of all the three quarters	–	1,540 MT

In the above instance, in the 3rd quarter accounts as on 31st December, the Production:

- for the third quarter is 340 MT or 56% utilisation
- for the cumulative period, the utilisation is 86% (1540/1800)

(d) If the answer to (c) above is to consider the cumulative production and not the production quarter-wise, whether it should be recommended to the management to plan for maintenance in the later quarters. Is the intention of the Accounting Standard to split hair? Whether this, in conjunction with the query, implies that the Accounting Standards should be considered for production planning.

(e) Since the undertaking is a continuous process plant, in spite of annual maintenance, there could be a major breakdown of critical machinery. In such instances, what should be the treatment of absorption of fixed overheads?

In the instant case, if the annual production is 2,400 MT, the average production per day would be 6.98 MT for effective working days of 344 days (365 days - 21 days for planned maintenance) and the normal production for 70 days would be 461 MT - thereby achieving 74% capacity utilisation on production of 340 MT. Alternatively, if the break-down days of 6 days are also excluded, the normal production for 64 days would be 422 MT – achieving 81% capacity utilisation on production of 340 MT.

(f) If the answer to (c) above is to consider cumulative production and not the quarter-wise production, in case of fall in demand of the product or for whatever reasons, the plant is shut down in the third quarter with nil production, what should be the treatment of absorption of fixed overheads in such instances? The cumulative production in such instance would be 1,200 MT, which will be 66% of cumulative pro-rated production of 1,800 MT.

(g) If the overheads are disallowed for inventorisation in the first quarter, whether the expenditure to be considered for the year-end inventory valuation excludes the overheads disallowed in quarter one as it is frozen and charged-off as expenditure in the first quarter, or the disallowed figure is to be reinstated for the year-end working of inventory valuation.

C. Points Considered by the Committee

11. The Committee notes paragraph 9 of AS 2 reproduced by the querist in paragraph 4 of the Facts of the Case. The said paragraph is reproduced below again for ready reference:

"9. The allocation of fixed production overheads for the purpose of their

inclusion in the costs of conversion is based on the normal capacity of the production facilities. Normal capacity is the production expected to be achieved on an average over a number of periods or seasons under normal circumstances, taking into account the loss of capacity resulting from planned maintenance. The actual level of production may be used if it approximates normal capacity. The amount of fixed production overheads allocated to each unit of production is not increased as a consequence of low production or idle plant. Unallocated overheads are recognised as an expense in the period in which they are incurred. In periods of abnormally high production, the amount of fixed production overheads allocated to each unit of production is decreased so that inventories are not measured above cost. Variable production overheads are assigned to each unit of production on the basis of the actual use of the production facilities."

12. On the basis of the above, the Committee is of the view that the first step for allocation of fixed production overheads is to arrive at the quantum of normal capacity of the production facilities. As per the above paragraph, the normal capacity is the production *expected* to be achieved on an average *over a number of periods under normal circumstances,* taking into account the loss of capacity resulting from planned maintenance. In other words, in the view of the Committee, the enterprise estimates the level of production which will be achieved during a period, say a year, *after* considering the planned maintenance and other normal wastages in the utilisation of the facilities. For example, an enterprise may have an installed capacity of say 10,000 MT a year, but after considering the planned maintenance and other normal wastages in capacity utilisation, the management may estimate on the basis of the past average of three years and the demand of the product over the next three years, that the normal capacity per year would be 8,000 MT. It is this quantity of 8,000 MT which will be considered as normal capacity for the purpose of allocation of fixed overheads. According to the Standard, the actual production capacity can be considered only if it approximates the normal capacity. The Committee notes that the Accounting Standard does not lay down any hard and fast rule as to what should be considered as an approximation of the normal capacity. The Committee is of the view that an enterprise will have to consider under the facts and circumstances of each case as to what can constitute an approximation keeping in view the considerations of materiality and other factors, such as the fluctuations in the actual production, vis-a-vis, the normal production. For instance, in the aforesaid example, the enterprise may decide that compared to the normal capacity of 8,000 MT, the approximation should be within the range of, say, plus/minus 2%. Thus, in the view of the Committee, the starting point is always the normal level of production which is considered for allocation of fixed overheads. It may be noted that the normal level of production is not changed every time there is a change in actual production as has been suggested by the querist. The normal level of production remains the same. The allocation of the fixed overheads to the actual production attained based on the allocation rate worked out on the basis of the normal production gives rise to an under or over allocation. The fixed production overheads that cannot be allocated on the basis of normal level of production are required to be charged to the profit and loss account as per paragraph 9 of AS 2 reproduced above.

13. With regard to allocation of fixed production overheads for the purpose of valuation of inventories for the financial results pertaining to the interim periods, the Committee notes the following extracts from Accounting Standard (AS) 25, 'Interim

Financial Reporting', issued by the Institute of Chartered Accountants of India:

"27. An enterprise should apply the same accounting policies in its interim financial statements as are applied in its annual financial statements, except for accounting policy changes made after the date of the most recent annual financial statements that are to be reflected in the next annual financial statements. However, the frequency of an enterprise's reporting (annual, half-yearly, or quarterly) should not affect the measurement of its annual results. To achieve that objective, measurements for interim reporting purposes should be made on a year-to-date basis.

28. Requiring that an enterprise apply the same accounting policies in its interim financial statements as in its annual financial statements may seem to suggest that interim period measurements are made as if each interim period stands alone as an independent reporting period. However, by providing that the frequency of an enterprise's reporting should not affect the measurement of its annual results, paragraph 27 acknowledges that an interim period is a part of a financial year. Year-to-date measurements may involve changes in estimates of amounts reported in prior interim periods of the current financial year. But the principles for recognising assets, liabilities, income, and expenses for interim periods are the same as in annual financial statements.

29. To illustrate:

(a) the principles for recognising and measuring losses from inventory write-downs, restructurings, or impairments in an interim period are the same as those that an enterprise would follow if it prepared only annual financial statements. However, if such items are recognised and measured in one interim period and the estimate changes in a subsequent interim period of that financial year, the original estimate is changed in the subsequent interim period either by accrual of an additional amount of loss or by reversal of the previously recognised amount…"

14. The Committee also notes paragraph 19 of Appendix 3, 'Examples of Applying the Recognition and Measurement Principles', of AS 25, which is reproduced below:

"19. Inventories are measured for interim financial reporting by the same principles as at financial year-end. AS 2 on Valuation of Inventories, establishes standards for recognising and measuring inventories. Inventories pose particular problems at any financial reporting date because of the need to determine inventory quantities, costs, and net realisable values. Nonetheless, the same measurement principles are applied for interim inventories. To save cost and time, enterprises often use estimates to measure inventories at interim dates to a greater extent than at annual reporting dates…"

15. On the basis of the above, the Committee is of the view that for the purpose of allocation of fixed production overheads, the enterprise will have to apply the same accounting policies in its interim financial results that are followed for annual financial statements. However, as mentioned in paragraph 19 of Appendix 3 of AS 25, reproduced above, the enterprise may rely on estimates to a greater degree. Thus, in case an enterprise estimates its normal production on an annual basis, and if there are no quarterly/seasonal variations, it can pro-rate the same appropriately, say equally, over the 4 quarters, in case the enterprise is preparing quarterly financial reports. In case there are quarterly/seasonal variations, the enterprise will have to estimate its normal capacity on the basis of the average of the relevant quarters/seasons of past few years, say, 3-5 years, also considering the demand of the product during the

season. For example, where a company is having seasonal variations say, in the third quarter of the year, then it should estimate the normal capacity for the third quarter based on the capacity utilisation of the third quarter for the past few years, say 3-5 years, also keeping in view the future demand of the product during the quarter. Once the normal capacity for a quarter is determined, as aforesaid, the quarter should be considered for measurement purposes, as per paragraph 27 of AS 25 on year-to-date basis, i.e., on cumulative basis. If there is an abnormal breakdown during a period, as per AS 2, the amount of fixed production overheads not allocated to units of production is charged to the profit and loss account. However, the result of under allocation of overheads or over allocation of overheads should not affect the measurement of its annual results since interim periods are parts of a financial year. This process is illustrated by way of an example as given in Annexure A.

D. Opinion

16. On the basis of the above, the Committee is of the following opinion on the issues raised by the querist in paragraph 10 above:

    (a) As explained in paragraph 12 above, the approximation to normal capacity should be based on the facts and circumstances of each case.

    (b) and (c) It is not always necessary to arrive at the normal level of production for each quarter based on equal production for all the quarters. Such a situation may arise only where it is expected that there are no seasonal or quarterly variations in production. In cases where quarterly/seasonal variations in production are expected, the normal level for the quarter(s) should be estimated based on the average of past 3-5 years of that quarter(s). This may be necessary in case of seasonal variations or where otherwise the quarterly production is expected to be lower, for example, the enterprise estimates that it will have to shut down the plant for normal maintenance during the quarter. In the case of the company in question, if the main demand and, therefore, the production, is expected in the third and fourth quarters, normal production should be determined separately for the third and the fourth quarters as explained above. Moreover, the above principles, as per paragraph 27 of AS 25, will have to be applied on year-to-date basis, i.e., cumulatively, as explained in paragraph 15 above.

    (d) Normal level of production as per AS 2 and AS 25 should be determined based on the expected maintenance and not the other way round as indicated by the querist that it should be used for production planning. The intention of AS 25 is to inventorise fixed production overheads measured on year-to-date basis so that the annual results are not affected.

    (e) In case of a major breakdown for a critical machinery, in a particular quarter, as per paragraph 9 of AS 2, the under allocation of overheads, if arrived at on year-to-date basis, should be charged to the profit and loss account for that quarter.

    (f) In case there is nil production in a quarter because of abnormal reasons, i.e., it was not factored in while estimating normal level of production for the quarter, and, if it results in under allocation of overheads on year-to-date basis, it should be expensed in that quarter.

    (g) Since the fixed production overheads are absorbed at the normal level of production, the rate should remain the same for year-end inventory valuation purposes.

Annexure A

Example:

Fixed production overheads for the financial year = Rs. 9,600.

Normal expected production for the year, after considering planned maintenance and normal breakdown, also considering the future demand of the product = 2,400 MT. In this example, it is considered that there are no quarterly/seasonal variations. Therefore, the normal expected production for each quarter is 600 MT and the fixed production overheads for the quarter are Rs. 2,400.

Actual production achieved:

First quarter	500 MT
Second quarter	700 MT
Third quarter	400 MT
Fourth quarter	700 MT

Fixed production overheads to be allocated per unit of production in every quarter will be Rs. 4 per MT (Fixed overheads/Normal production).

First quarter

Actual production overheads = Rs. 2,400

Fixed production overheads based on the allocation rate of Rs. 4 per unit allocated to actual production = Rs. 4x500 =Rs. 2,000

Unallocated fixed production overheads to be charged as expense as per paragraph 9 of AS 2 and consequently as per AS 25 = Rs. 400

Second quarter

Actual fixed production overheads on year-to-date basis Rs. 4,800

Fixed production overheads to be absorbed on year-to-date basis 1200x4 = Rs. 4,800

Rs. 400 was not allocated to production in the first quarter. To give effect to the entire Rs. 4,800 to be allocated in the second quarter, as per paragraph 29(a) of AS 25, Rs. 400 are reversed by way of a credit to the profit and loss account of the second quarter.

Third quarter

Actual production overheads on year-to-date basis = Rs. 7,200

Fixed production overheads to be allocated on year-to-date basis 1,600x4 = Rs. 6,400

Under allocated overheads Rs. 800 to be expensed as per paragraph 9 of AS 2 and consequently as per AS 25

Fourth quarter/Annual

Actual fixed production overheads on year-to-date basis Rs. 9,600

Fixed production overheads to be allocated on year-to-date basis 2,300x4 = Rs. 9,200

Rs. 400, i.e., [2,800(i.e., Rs.4x700) - 2,400] over allocable in the fourth quarter, is to be reversed as per paragraph 29(a) of AS 25 by way of a credit to the profit and loss account.

Unallocated overheads for the year Rs. 400 are expensed in the profit and loss account as per paragraph 9 of AS 2.

The cumulative result of all the quarters would also result in unallocated overheads of Rs. 400, thus, meeting the requirements of paragraph 27 of AS 25 that the quarterly results should not affect the measurement of the annual results.

This example presumes that there are no quarterly/seasonal variations. In a case where there are quarterly/seasonal variations, the estimates of normal capacity would have to be made on the quarterly/seasonal basis as discussed in paragraph 15 of the Opinion, which would then be added up to determine the normal capacity for the year on the basis of which the absorption rate will be determined. The variations between the seasons would thus be considered normal and treated accordingly.

Notes:

1. The Opinion is only that of the Expert Advisory Committee and does not necessarily represent the Opinion of the Council of the Institute.
2. The Compendium of Opinions containing the Opinions of Expert Advisory Committee has been published in 24 volumes which are available for sale at the Institute's office at New Delhi and its regional council offices at Mumbai, Chennai, Kolkata and Kanpur.