CHAPTER - VI

BUDGETING AND CONTROLLING OF RESEARCH AND DEVELOPMENT EXPENSES - THE INDIAN PRACTICE

Every organisation has to be managed effectively and efficiently. Managing, in fact, implies co-ordination and control of the total efforts to achieve the organisational objectives. This process of managing is facilitated when management charts its future course of action well in advance. The function of management also includes decision-making. This decision making function is facilitated by various managerial techniques, procedures and by utilisation of the individual and group efforts in a co-ordinated and rational way. This helps, first, to ensure that the final results of operational activities are consistent with the organisations goals and secondly, to prevent sub-optimisation within the organisation by ensuring, as far as possible, that individual managers are working towards the same end. One systematic approach for attaining effective management performance is profit planning or budgeting.


Research and Development costs arise from periodic policy decisions of the tcp management regarding the maximum permissible amount that may be appropriated and incurred against an item. They fall under the category of managed or programmed costs which is commonly known as discretionary costs. They are so called because they are incurred as a result of management discretion. Research and Development costs being managed or discretionar costs are decided upon by management at the start of the budget period. Keeping in view the objectives selected and the means for their attainment the maximum amount to be spent is specified and appropriated in the budget. With this in the backdrop an attempt is made in this chapter, first, to deal with the concept of budget as an instrument of control and co-ordination and secondly to examine the present system of exercising budgetary control over Research and Development expenses in the Indian industries.

Meaning of a Budget:

The word 'budget' is derived from a French term 'Bougette' which denotes a leather pouch in which funds are appropriated for meeting anticipated expenses. The same meaning applies to the business management. Thus a budget is a comprehensive and co-ordinated plan expressed in financial terms, for the operations and resources of an enterprise for some specific period in the future. It is the

plan of the firm's expectations in the future. Planning involves the control and manipulation of relevant variables - controllable and non-controllable with a view to reducing the impact of uncertainties. It makes management active to influence the environment in the interest of the enterprise. A budget expresses the plan in formal terms and helps to realise the firm's expectations. It is a comprehensive plan in the sense that all activities and operations are considered when it is prepared.

As an instrument of managerial control and coordination over a business enterprise the different terminologies that one may come across in connection with a budget are, Long Range budget, Short Range budget and Fiscal period budget when it is viewed with reference to time dimension; Financial budgets and Non Financial budgets depending on its classification on the basis of monetary and physical unit; Fixed budget and Flexible budget when it is viewed with reference to flexibility; Authoritative budgets and Participative budgets on the basis of the level of participation in the preparation of a budget. Budgets may also be classified according to functions for which they are prepared and employed. When budgets are viewed in terms of functions they are termed as Functional budgets and the functional budgets comprises Sales budget, Selling and Distribution cost budget, Production budget, Production cost budget, Personnel budget, Purchasing budget, Plant Utilisation budget, Capital expenditure budget, Administration cost budget, Research and Development cost
budget etc. Ultimately on the basis of these functional budgets, a 'Master Budget' for the firm is also prepared. Needless to mention Master budget is the end product of the budget preparation process and commonly takes the form of a budgeted profit and loss account and budgeted balance sheet. Thus the development of the master budget is a somewhat sequential process in which information from one budget is input for another budget.5

The Current Budgeting Practices for Research and Development

Research and Development cost budget is a functional budget. It is a planned outlay on Research and Development. This budget is intended to show in terms of money the permissible limits within which activities are to be pursued and how they are to be taken up. Research and Development costs are incurred as a result of management discretion and such costs have the following characteristics:

(a) To start with such costs arise from periodic (usually yearly) appropriation decisions regarding the maximum amounts to be incurred.

(b) Secondly, they do not have a demonstrable optimum relationship between inputs (as measured by the costs) and outputs.

(as measured by revenue or other objectives such as students knowledge or patient's health)

(c) Thirdly, they may have no particular relationship with volume of activity.

(d) Finally, they can be reduced if not eliminated altogether for a given year in case of financial hardship of the company or due to any other reasons.

In the annals of budgeting we have three concepts of budget namely Conventional incremental budgeting, performance budgeting and Zero Base budgeting. Conventional incremental budgeting emphasises upon the financial aspects and does not generally take into account the physical aspects or performance. But performance budgeting is essentially a technique by which programmes, projects, activities, etc. may be identified in a budget in physical and financial terms so that the relationship between inputs and outputs can be more clearly established. Zero base budgeting concept demands that the budgeting process should start from scratch. Each budgeted item of expenditure should be justified before its inclusion in the budget proposal regardless of what has been spent in the previous budget period. Zero-base budgeting is especially adaptable to discretionary costs. But in reality as will be seen latter Research and Development costs budgets in Indian industries are still prepared under the conventional incremental budgeting. In respect of actual budgetary practices in the Indian industries a previous study disclosed that budget provisions for Research and development

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Development is related to the expected increase of turnover. In support of this, the case of an engineering company was cited. This company expected an increase in turnover by 12% as such it increased its budget allocation for Research and Development by 12% over the previous year’s figure. In case of a pharmaceutical company, the budget provision for Research and Development was just doubled (20%) as expected increase in turnover (10%) over the previous year’s amount. The same study also spoke of a government guideline in this respect. According to this guideline, if the sales value exceeds ₹5 crores per year, then the net fixed assets for Research and Development should be equal to or greater than 20% of total net block and revenue expenditure should be greater than or equal to 4% of turnover. And there is a sort of upper limit for annual outlay @ 5% of sales value.

From these it appears that in some cases the belief is that the Research and Development allocation should follow estimated sales performance, though Research and Development is not a basic causal factor behind sales, it does help sales efforts. In some cases Research and Development outlay has been visualised as a causal factor behind sales. As such the policy has been to have more of funds available for Research and Development.

8. Ibid.
to attain a desirable degree of growth in turnover. In respect of government guidelines mentioned above the study did not find any rationale though these apply mostly to the foreign companies in the drug industry only. The study also pointed out the ambiguity in the present practices of budget allocation for Research and Development in as much as there is no specific mention of how much of the said allocation was for capital expenditure and how much for revenue expenditure.

The same study also spoke of certain other general guidelines in respect of Research and Development budget which are more of a tentative and qualitative type. These are as under:

(i) Research and Development budget is prepared on the basis of the merit of individual projects. In support of this the case of a large engineering company was cited. In this company the total Research and Development budget had been maintained somewhere around 2.5 per cent to 3 per cent of sales.

(ii) While preparing Research and Development budget the emphasis is more on capital expenditure budget than on recurring expenditure budget. And in the matter of allocation of financial resources last year's actual expenditure for Research and Development is kept in view (A Chemical Company).

(iii) Last year's spending in respect of Research and Development

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9: Ibid.
and future needs for the same are tried to be balanced. Growth in outlay is also tried to be kept as smooth as possible (A large Chemical and Consumer goods Company).

(iv) Normally the revenue expenditure budget for Research and Development is decided on the basis of last year's budget and capital expenditure outlays for the same are budgeted on the basis of the merit of individual projects. In support of this an instance of a paints company was cited. In this Company the finance function played practically no role in the matter of both capital expenditure and Revenue expenditure budgets for Research and Development.

(v) Current year's total outlay for Research and Development should be in line with last year's spending and this should be justified by worthwhile projects. Within this framework aggregate Research and Development budget is compiled essentially from individual project budgets (A Chemical and Paints Company).

(vi) When the Company does not have any detailed revenue budget for Research and Development the same is prepared along the lines of financial account expense heads. Thus Research and Development budgets, remain hidden within them. And capital budgets for Research and Development are prepared independently on a case-to-case basis.

(vii) Since there had been sufficient amount of working capital the annual budgets for Research and Development faced very
little stringent scrutiny in a public sector mining company.

(viii) In an intermediate and capital goods engineering firm Research and Development budget is decided on the basis of project-wise budgets and tax benefit certainly influenced Research and Development budget allocation.

(ix) Since international headquarters spent about 1.5 per cent of sales on Research and Development an intermediate goods firm tried to follow closely this guideline.

(x) On the basis of last year's budget and the coming year's work plans however, there does not appear to be such of an inclination in the foreign headquarters to expand Research and Development activities in India. In support of this the case of a pharmaceutical company was cited.

For the purpose of our present exercise questionnaires (vide annexure - I) were issued to 100 Companies belonging to major industries such as electricals, industrial equipments, cement, steel, drugs, pharmaceuticals, chemicals, telecommunication, fertilisers, paints, jute, medical equipments etc. in India both under private and public sectors. Of these only 16 companies in the private sector and 4 companies in the public sector responded. In respect of budgetary practices for the allocation of funds towards Research and Development expenditure, reply to the questionnaires revealed:
ANDREW YULE & COMPANY LIMITED

Public Sector

Electricals, Industrial equipments and others

Tea Machinery, Air pollution control equipment, Transformer and Switchgear, Tea, Electrical units, Togami units etc.

Both fundamental research and applied research

Rs. 117.92 crores

This company is carrying on Research and Development in various operating units and the Research and Development units render back up support to various production and processes by providing timely advice and assistance in improving quality and performance. In this company over the five years, 1985-86 to 1989-90 it had been noticed that before 1988-89 there had been no separate allocation in respect of Research and Development budget but from 1988-89 Research and Development expenditure had been segregated. Further during the period 1988-89 there had been no allocation for capital expenditure on Research and Development. Only during 1989-90 separate allocations for capital expenditure and revenue expenditure on Research and Development had been made. A noteworthy feature in this company is that it had been following conventional
system that is traditional system of budgeting in respect of Research and Development allocations and total Research and Development expenditures had always been measured as a percentage of total turnover. It had also been noticed that during 1989-90 total percentage of Research and Development expenditures had been increased by more than 3.5 times over the previous year and total amount of revenue expenditure on Research and Development for 1989-90 had been more than capital expenditure for the same.
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<tr>
<th>Name of the Company</th>
<th>RECKITT &amp; COLMAN OF INDIA LIMITED</th>
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<tr>
<td>Private/Public Sector</td>
<td>Private Sector</td>
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<tr>
<td>Industry Group</td>
<td>Drugs, Pharmaceuticals, Chemicals and Others</td>
</tr>
<tr>
<td>Main Production Lines</td>
<td>Detergents, Polishes, Liquid antiseptic</td>
</tr>
<tr>
<td>Nature of Research Project undertaken</td>
<td>Both fundamental research and applied research</td>
</tr>
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<td>Average Turnover (over the 5 years since 1985-86)</td>
<td>Rs.71.40 crores</td>
</tr>
<tr>
<td>Present Practice</td>
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The objectives for undertaking the research project of this Company had been reduction in consumption of raw materials/energy in production processes, improvement in product quality, substitution of scarce/costly raw materials and enlarging the raw material base, finding new uses for existing products, developing new process for existing products, developing totally new products etc. Over the five years since 1985-86 it had been found that the Company maintained a separate regular budgetary allocation for every year in respect of Research and Development and the allocation had been decided by Research and Development Head according to projects in progress and project plans in operation. The Research and Development budget of this company covered both capital and revenue expenditures but while preparing any budget for Research
and Development more emphasis had been given on revenue expenditure budget than capital expenditure. In support of this it may be pointed out that during 1985-86 the Company's expenditure for Research and Development represented only 27.9% of the total Research and Development expenditures when recurring expenditure for the same had been more than 2.5 times of capital expenditure. Similarly during 1986-87 when total capital expenditure for Research and Development had been 10.85% of the total Research and Development expenditures, the revenue expenditure for the same had been more than 8 times of capital expenditure. Analysis of the budgetary practices in this Company further revealed that in the matter of allocation of funds for Research and Development last year's actual expenditure had always been kept in view.
ELECTROSTEEL CASTINGS LIMITED
Private Sector
Industrial Machinery
Cast Iron Spun Pipes, Grinding Media, Steel Castings etc.

Both fundamental research and applied research
Rs. 41.57 crores

In this company over the five years from 1985-86 to 1989-90 it had been noticed that the Company maintained a separate Research and Development unit and the status of this unit had been very important. The objectives for undertaking research projects of this company had been reduction in consumption of raw materials, improvement in product quality, substitution of scare/costly raw materials and enlarging the raw material base, developing totally new products, developing new design methodologies etc. Though the company established a separate Research and Development unit it did not maintain any regular separate budgetary allocation for the same. All expenditures for Research and Development unit had been sanctioned from central budget depending upon the basis of the merit of individual projects and past performance.
From the periods 1985-86 to 1989-90 a noteworthy feature in this company had been that the company maintained a separate Research and Development unit with very important status. But before 1989-90 there had been no separate allocation for Research and Development unit. Since 1989-90 the company maintained a separate regular budgetary allocation for Research and Development covering both capital and revenue expenditures. Such allocation had been decided by 'Head' of Research and Development and according to the projects in progress and project plans in operation. But the amount of capital expenditure occupied a very little share in the total Research and Development expenditure. In this Company expenditure for Research and Development is measured as a percentage of total turnover. During the year 1989-90 total Research and Development expenditure had been 0.37 % of total turnover and capital expenditure had been 10.77 % of total Research and Development expenditure while revenue expenditure had been more than 8 times of capital expenditure.
ININDIAN OXYGEN LIMITED
Private Sector
Medical equipments and gas
Oxygen, dissolved acetylene, welding electrodes
Applied research only
Rs.128.58 crores
In this Company over the five years from 1985-86 to 1989-90 it had been noticed that the Company maintained a separate regular budgetary allocation for every year in respect of Research and Development and the allocation had been decided by Research and Development 'Head' according to projects in progress and project plans in operation. The Research and Development budget of the firm covered both capital and revenue expenditure but while making any budget for Research and Development more emphasis had been given on revenue expenditure budget than capital expenditure. In the matter of allocation of funds for Research and Development last year's actual expenditure had always been kept in view. During the period 1985-86 the Company's capital expenditure for Research and Development had been 12.72% of the total Research and Development expenditure and the amount of revenue
expenditure for the same had been about 7 times of capital expenditure. Similarly during 1986-87 capital expenditure on Research and Development had been 4.58% of the total Research and Development expenditure and revenue expenditure for the same had been 21 times of capital expenditure. During 1987-89 the Company's capital expenditure represented only 1.41% of the total Research and Development expenditure and revenue expenditure for the same represented more than 70 times of capital expenditure. Again during 1989-90 the amount of capital expenditure had been 4.42% of the total Research and Development expenditure and revenue expenditure had been more than 21 times of capital expenditure. It had also been noticed that Research and Development expenditure in this Company had been measured as a percentage of total turnover.
INCAB INDUSTRIES LIMITED
Private Sector
Electricals and Telecommunication
Electrical Cables, Wires
Both fundamental research and applied research
Rs.119.62 crores
(over the 5 years since 1985-86)
Over the five years since 1985-86 the Company had been preparing a separate regular conventional budget in respect of Research and Development. Research and Development allocations were made by the manager of Research and Development Department on the basis of past practices and projects to be taken up in future. While preparing Research and Development budget of the Company more emphasis had been given on revenue expenditure than on capital expenditure. In support of this it might be pointed out that during the year 1989-90 the Company's capital expenditure for Research and Development represented only 14.1% of the total Research and Development expenditure when revenue expenditure for
the same had been more than 6 times of capital expenditure. Similarly during 1988-89 when total capital expenditure for Research and Development had been 9.07% of the total Research and Development expenditure, the revenue expenditure for the same had been more than 10 times of capital expenditure. It had also been noticed that the company measured its total Research and Development expenditure as a percentage of turnover. Analysis of the budgetary practices in this Company further revealed that over 3 years since 1985-86 the Company maintained the same percentage of Research and Development expenditure on turnover every year. In the year 1988-89 the percentage of Research and Development expenditure in the Company had been decreased but from the year 1989-90 the same showed once again an increasing trend.
The Company's Research and Development organisation directed its efforts towards the fulfilment of a two-fold objective. First, quick transfer and absorption of imported technologies from Crest and Pachiney, and second, their correct application to production processes for improving the quality of work at plant level. At the same time, the problem areas were identified and effective measures were devised to make the company's product cost-effective. In this company over the 5 years from 1985-86 to 1989-90 it had been noticed that before 31st March 1989 Research and Development Organisation was in function but no separate allocation in the budget for Research and Development was made.
Since April 1989 the Company maintained a regular separate conventional budgetary allocation in respect of Research and Development covering both capital and recurring expenditures. But capital expenditure occupied a very little share in the total Research and Development expenditure. During the period 1989-90 the Company's capital expenditure for Research and Development had been 1.74 per cent of the total expenditure on Research and Development and the amount of recurring expenditure had been more than 56 times of the capital expenditure. Similarly during the period January 1988 to March 1989 the amount of capital expenditure in respect of Research and Development had been 0.93 per cent of the total expenditure on Research and Development and the amount of revenue expenditure for the same had been more than 106 times of capital expenditure. During 1989-90 the Company had increased its total Research and Development expenditure with increased turnover over the previous year. It had also been noticed that Research and Development expenditure had always been measured as a percentage of total turnover.
Name of the Company : PHILLIPS CARBON BLACK LIMITED
Private/Public Sector : Private Sector
Industry Group : Electrical Engineering
Main Production Lines : Carbon Black
Nature of Research Project undertaken : Both fundamental research and applied research
Average Turnover (over the 5 years since 1985-86) : Rs.68.59 crores

Present Practice :

The areas of Research and Development activities of the Company over the period of five years between 1985-86 and 1989-90 had been product/process improvement, new feedstocks adaptations, new products development, energy conservation, pollution control and application research in the Research and Development lab and research projects sponsorship in IIT, Khargapur and guidance to the scholars in areas of polymer technology using carbon black. In respect of Research and Development in the period under reference the Company maintained a separate regular budgetary allocation for every year and Research and Development had been the important aspect of Company activities. The Research and Development budget of this Company covered both capital and revenue expenditure but while making any budget for Research and Development more emphasis had been given on revenue expenditure than
capital expenditure. During the period October 1989 to September 1990 the Company's capital expenditure for Research and Development had been 38.88% of the total Research and Development expenditure and the amount of recurring expenditure for the same had been more than 1.5 times of capital expenditure. Similarly during the period April 1988 to September 1989 capital expenditure for Research and Development had been 16.74% of the total Research and Development expenditure and recurring expenditure for the same had been 83.26% of the total Research and Development expenditure that is about 5 times of capital expenditure. During April 1987 to March 1988 the Company's capital expenditure represented 30.16% of the total Research and Development expenditure and recurring expenditure for the same represented more than 2 times of capital expenditure. It had also been found that the expenditure for Research and Development in this Company had always been measured as a percentage of turnover and Research and Development budget is prepared on the basis of the merit of individual projects.
Name of the Company: MYSORE CEMENTS LIMITED
Private/Public Sector: Private Sector
Industry Group: Cement
Main Production Lines: Cement
Nature of Research Project undertaken: Both basic research and applied research
Average Turnover: Rs.102.7 crores
(over the 5 years since 1985-86)

Present Practice:

In this company it is planned to carry out Research and Development for production of high strength cement, low alkali cement and sulphate resistant cement which would be an import substitute. Over the five years since 1985-86 it had been noticed that the Company maintained a separate regular budgetary allocation for every year in respect of Research and Development. The Research and Development budget of this Company covered both capital and revenue expenditure but while preparing a budget for Research and Development more emphasis had been given on recurring expenditure than capital expenditure.
ICI INDIA LIMITED

Private Sector

Fertilizers, Chemicals, Fibre and Paints

Paints, explosives, chemicals, psf, fertilisers

Both fundamental research and applied research

Rs. 407.83 crores

In this Company the Research and Development area accorded high priority with the Alchemic Research Centre providing effective support. The objectives for undertaking Research and Development activities of this Company had been development of new generation emulsion explosives, process and product development in the areas of pharmaceuticals, agro-chemicals, paints and rubber chemicals, development of a new process for synthesis of an intermediate for a cardio-vascular drug which had been currently imported, slow release urea to optimise urea usage, treatment of ammonia plant effluents etc. Over the 5 years from 1985-86 to 1989-90 it had been found that, the company maintained a separate regular budgetary allocation for every year in respect of Research and Development covering both capital and revenue expenditure. Such
allocation in the budget had been decided by Head of Research and Development and according to the projects in progress and project plans in operation. In the total budget for Research and Development the amount of capital expenditure occupied a very little share. In support of this it may be pointed out that during 1989-90 the Company's capital expenditure for Research and Development represented only 18.78% of the total Research and Development expenditure and recurring expenditure for the same represented 81.22% of the total Research and Development expenditure. Thus the amount of recurring expenditure in the year 1989-90 had been more than 4 times of capital expenditure. Similarly during October 1987 to March 1989 total capital expenditure for Research and Development had been 11.14% of the total Research and Development expenditure and revenue expenditure for the same had been about 8 times of capital expenditure. It had also been noticed that Research and Development expenditure in this Company had been measured as a percentage of total turnover.
Name of the Company : THE NUDDEA MILLS COMPANY LIMITED
Private/Public Sector : Private Sector
Industry Group : Jute
Main Production Lines : Gunny Cloth, gunny bag, decorative cloth i.e. wall covering
Nature of Research Project undertaken : Applied Research
Average Turnover : Rs.24.88 crores
(over the 5 years since 1985-86)

Present Practice :

Research and Development activity of the Nuddea Mills Company Limited is done in two ways - first by contributing membership subscription to Indian Jute Industries Research Association and secondly by 'In-house Research and Development activity. In case of in-house Research and Development activity, it had been noticed, over the 5 years since 1985, that the company maintained a separate regular conventional budgetary allocation for every year to a very minimum extent in respect of recurring Research and Development expenditure only. So no allocation had been made for capital expenditure. But allocation for recurring Research and Development expenditure had been continued up to 1987 because from June 1988 the Company had declared lockout. During the year 1987 the amount of recurring Research and Development expenditure for in-
house Research and Development activity represented only 0.0033% of total turnover. Similarly for 1986 the same had been 0.0045% of turnover. During July 1984 to December 1985 the amount of recurring Research and Development expenditure for in-house Research and Development activity represented 0.0052% of turnover. It had also been noticed that in this Company research is mainly directed towards applied research that is development of different quality of decorative fabrics and any increase/decrease in turnover either in value or in quantity had been the index for measurement of research activity.
Name of the Company : THE ASSOCIATED CEMENT COMPANIES LIMITED
Private/Public Sector : Private Sector
Industry Group : Cement
Main Production Lines : Cement
Nature of Research Project undertaken : Both fundamental research and applied research
Average Turnover (over the 5 years since 1985-86) : Rs.754.11 crores

Present Practice:

In this Company Research and Development is a distinct functional area which is in charge of a controller. The Controller of Research and Development reports to a wholetime Director who is a member of Executive Committee of Directors. Over the 5 years since 1985-86 it had been noticed that Research and Development were the part and parcel of the Company. The Company had been preparing a separate regular budget in respect of Research and Development covering both capital and recurring expenditures. While preparing Research and Development budget more emphasis had been given on recurring budget than capital budget. In support of this it had been pointed out that during the year 1989-90 the Company's capital expenditure had been 8 % of the total Research and Development expenditure and revenue expenditure for the same year had been more than 11 times of the capital expenditure. It had also been found that the Company measures its total Research and Development expenditure in terms of percentage of total turnover.
The objectives for undertaking research projects by the Company had been reduction in consumption of raw materials/energy in production processes, improvements in product quality, substitution of scarce/costly raw materials and enlarging the raw material base, making different products from the same raw materials, developing new process for existing products, developing totally new products etc. From the periods 1985-86 to 1989-90 a noteworthy feature in this firm had been that the Company is maintaining a separate Research and Development unit, controlled by the Technical Director with a very limited number of efficient Research and Development staff. From this year the Company also started making a separate regular budgetary allocation in respect of Research and Development based on the estimated requirements of funds. Analysis of the budgetary practices in this Company further revealed that the Company measures its total Research and Development expenditure as a percentage of total turnover. Total allocation of funds for Research and Development in the Company hovers round 1 % to 1.6 % of total turnover.
THE TATA IRON AND STEEL COMPANY LIMITED

Private Sector

Iron and Steel

Saleable Steel

Both fundamental research and applied research

Rs.1627.6 crores

Over the 5 years since 1985-86 the Company had been preparing a separate regular budget in respect of Research and Development. Research and Development allocations are made by the Head of Research and Development department on the basis of past practices and projects to be taken up in future. While preparing Research and Development budget of the Company more emphasis is
given on revenue expenditure than capital expenditure. In support of this it might be pointed out that during the year 1989-90 when the capital expenditure for Research and Development in this Company was 17.68% of the total Research and Development expenditure, the recurring expenditure for the same had been more than 4.5 times of capital expenditure. It has also been found that the Company always tried to measure its Research and Development expenditure as a percentage of total turnover.
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<tr>
<th>Name of the Company</th>
<th>SHAW WALLACE &amp; COMPANY LIMITED</th>
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<tr>
<td>Private/Public Sector</td>
<td>Private Sector</td>
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<tr>
<td>Industry Group</td>
<td>Chemicals, Liquor and Fertilizers</td>
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<tr>
<td>Main Production Lines</td>
<td>Agro-chemicals, Fertilizers, Liquor and Chemicals</td>
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<tr>
<td>Nature of Research Project undertaken</td>
<td>Both fundamental research and applied research</td>
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<tr>
<td>Average Turnover (over the 5 years since 1985-86)</td>
<td>Rs. 319.98 crores</td>
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<td>Present Practice</td>
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The areas of Research and Development activities for the Company over the period of 5 years between 1985-86 and 1989-90 had been product, process and quality improvement in respect of all the existing products of the Company, development of new products, both for domestic and export markets. For Research and Development, in the period under reference, the Company made always a separate regular budgetary allocation in every year. Allocations were based on level of Research and Development planning. Research and Development activities at the locations were managed in this Company by the Factory Production Managers. The Research and Development budget of this Company covered both capital and revenue expenditure and it was the recurring expenditure which had major share in the total Research and Development
expenditure. In support of this it might be cited that during the period 1989-90 the Company's capital expenditure for Research and Development represented 37.3% of the total Research and Development expenditure when recurring expenditure for the same had been more than 1.5 times of the capital expenditure. As is the practice with the other Companies, in this Company also budgetary allocations are always measured as a percentage of total turnover and it had always been in the range of 0.05 per cent to 0.2 per cent of total turnover.
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<th>Name of the Company</th>
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<tr>
<td>Private/Public Sector</td>
<td>Private Sector</td>
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<tr>
<td>Industry Group</td>
<td>Electricals</td>
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<tr>
<td>Main Production Lines</td>
<td>Batteries, Flash light cases, Polythylene</td>
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<tr>
<td>Nature of research project undertaken</td>
<td>Both fundamental research and applied research</td>
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<tr>
<td>Average Turnover</td>
<td>₹179.52 crores</td>
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<td>(over the 5 years since 1985-86)</td>
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**Present Practice:**

Over the 5 years since 1985-86 it had been noticed that the specific areas in which Research and Development had been carried out by the Company were product, process and quality improvements in all existing Company products, source development for raw materials, import substitution for raw materials and spares, and development of new products, both for domestic and export markets. In respect of Research and Development in the period under reference the Company maintained a separate regular budgetary allocation for every year. Research and Development allocations were based on projections given by the Research and Development unit before commencement of the financial year. The total Research and Development allocation covered both capital and recurring expenditures but capital expenditure for Research and Development occupied a very little share in total expenditure for the same. In support of this it might
be pointed out that during the year 1989-90 the Company's capital expenditure for Research and Development had been only 8.5% of the total Research and Development expenditure while the recurring expenditure for the same had been more than 10.5 times of total capital expenditure. Similarly during the period 1988-89 when capital expenditure for Research and Development represented only 0.24% of the total Research and Development expenditure, the recurring expenditure for the same had been more than 416 times of capital expenditure. Analysis of the budgetary practices also revealed that in this Company expenditure for Research and Development is measured as a percentage of total turnover.
Name of the Company: BHARAT HEAVY ELECTRICALS LIMITED (BHEL)

Private/Public Sector: Public Sector

Industry Group: Engineering

Main Production Lines: Power equipment, industrial equipment

Nature of research Project undertaken: Both fundamental research and applied research

Average turnover (Over 5 years since 1985-86): Rs.2316.13 crores

Present Practice:

Research and Development activities in BHEL are carried out in two ways. First, through different engineering and development centres located at all the manufacturing plants and service divisions of BHEL. It provided the basic product and product-engineering support, in accordance with the customers' specifications and contractual obligations. Secondly, through corporate Research and Development division to render assistance to the product and development centre of plants, discipline-wise for analysing the failures in details and for integrated betterment approach for the product and systems.

Present study reveals that over the five years between 1985-86 and 1989-90 the Company had been preparing a separate regular conventional budget in respect of Research and
Development. Research and Development allocations were made by the General Manager of Research and Development on the basis of past practices and projects to be taken up in future. Further, while preparing Research and Development budget of the Company, more emphasis had been given on revenue expenditure than on capital expenditure. In support of this it might be pointed out that during the year 1989-90 the Company's capital expenditure for Research and Development represented only 9.1% of the total Research and Development expenditure when recurring expenditure for the same had been about 10 times of capital expenditure. Similarly, during 1988-89 when total capital expenditure in the Company for Research and Development had been 5.3% of the total Research and Development expenditure, the recurring expenditure for the same had been more than 17 times of capital expenditure. This Company also measures its total Research and Development expenditure in terms of percentage of total turnover.
Name of the Company: BALMER LAWRIE & COMPANY LIMITED
Private/Public Sector: Public Sector
Industry Group: Chemicals, Containers and Others
Main Production Lines: Greases and lubricants, leather chemicals, antioxidants, oleochemicals, containers, marine freight containers, LPG cylinders.

Nature of research Project undertaken: Both fundamental research and applied research

Average Turnover: Rs. 168.48 crores
(over the 5 years since 1985-86)

Present Practice:

The objectives for undertaking research projects in the Company had been reduction in consumption of raw materials/energy in production processes, improvements in product quality, substitution of scarce/costly raw material base, finding new uses for existing products, making different products from the same raw materials, developing new process for existing products, developing totally new products, developing new equipment, developing new design methodologies etc.

Over the last five years since 1985-86 this Company also had a separate regular budget allocation in every year for Research and Development which incidentally became an
important aspect of Company activities. Research and Development department in this Company is headed by a General Manager who reports to Managing Director. The allocations for Research and Development were based on projections given by the Research and Development unit before commencement of each financial year. The allocation for Research and Development covers both capital expenditure and recurring expenditure. But recurring expenditure occupied the major share in the total Research and Development budget. It be pointed out in this connection that during the year 1989-90 the Company's capital expenditure for Research and Development had been 19.4% of total expenditure on Research and Development when the amount of recurring expenditure had been more than 4 times of capital expenditure. Similarly during the year 1988-89 when the capital expenditure for Research and Development represented 24.4% of total Research and Development expenditure, the recurring expenditure for the same had been more than 3 times of capital expenditure. It had also been found that the Company always tried to control its Research and Development activities through periodic review by a Committee constituted of Senior Executives holding key positions in the Company. As is the other Companies, this Company also measures its budget allocation as a percentage of total turnover.
Name of the Company: METROARK PRIVATE LIMITED
Private/Public Sector: Private Sector
Industry Group: Chemicals
Main Production Lines: Silicon and allied products
Nature of Research Project undertaken: Fundamental research

Average Turnover: ₹3.75 crores
(over the 5 years since 1985-86)

Present Practice:

The objectives for undertaking research projects by the Company had been improvements in product quality, reduction in consumption of raw materials/energy in production processes, finding new uses for existing products, making different products from the same raw materials, developing new process for existing products, developing totally new products etc.

From the periods 1985-86 to 1989-90 a noteworthy feature in this firm had been that the Company maintained a separate Research and Development wing which is recognised by the department of Scientific and Industrial Research. Since 1985-86 the Company had been making a separate regular budgetary allocation in respect of Research and Development covering both capital and revenue expenditure. In this Company, Research and Development allocation had been based on requirement estimate. Research and Development expenditure in this Company had always, as was the case with the others, been measured as a percentage of total turnover and Research and Development budget in this Company ranged between 0.5% and 1.3% of the total turnover.
Name of the Company: STEEL AUTHORITY OF INDIA LIMITED (SAIL)
Private/Public Sector: Public Sector
Industry Group: Steel
Main Production Lines: Saleable Steels
Nature of Research Projected undertaken: Both fundamental research and applied research
Average Turnover (over the 5 years since 1985-86): Rs. 55,666.63 crores

Present Practice:

Specific areas in which Research and Development carried out by the Company are basic research, improvement in quality of raw materials, conversion of energy, augmenting productivity, quality and yield and trouble shooting in different areas of plant operations. Over the 5 years since 1985-86 Research and Development budgeting in this Company had been done in two parts. In the first part for 'Projects of National character and in the second for 'In-house Research and Development activity'. In respect of volume the total Research and Development budget for projects of national character had been about 5 times more than that of the in-house Research and Development activity. For each part there had been a capital Research and Development budget and a revenue Research and Development budget. During the year 1989-90 total capital expenditure for Research and Development had been 40.65% of total...
Research and Development expenditure and recurring expenditure for the same had been about 1.5 times of capital expenditure. Similarly during 1988-89 the amount of capital expenditure represented 39.90% of total Research and Development expenditure and recurring expenditure for the same represented more than 1.5 times of total capital expenditure. Thus the amount of recurring expenditure occupied the major share in the total Research and Development expenditure over the 5 years. As is the practice with the other Companies in this Company also budgetary allocations are always measured as a percentage of total turnover.