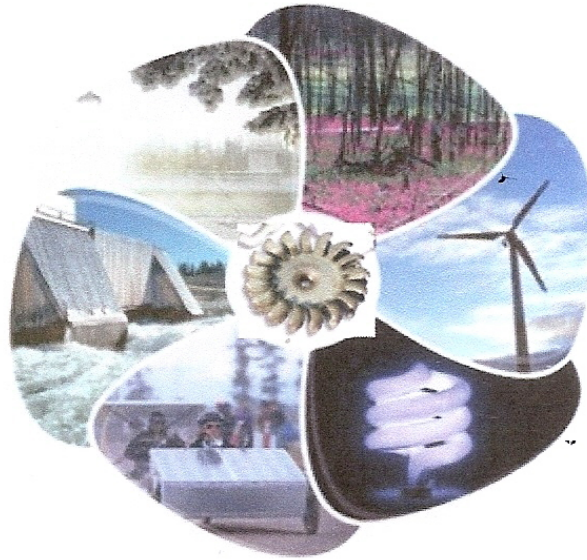




## CORPORATE R & D POLICY



Approved as per  
Board's decision on  
12/01/12  
Vinay Tripathi  
कंपनी सचिव  
एनएचडीसी लि भोपाल



### एन एच डी सी लिमिटेड

(एनएचपीसी लिमिटेड एवं मध्य प्रदेश शासन का संयुक्त उद्यम)

### N H D C Limited

(A Joint Venture of NHPC Limited & Govt. of M.P.)

## INDEX

Section. No.	CONTENTS	Page No.
1	Rationale	2
2	Scope & Meaning	3-6
3	Policy, Planning & Budgeting	7-10
4	Implementation	11-14
5	Monitoring	15-16
6	Filling up Target Setting cum Evaluation Template and Mark/ Weight Allotment Procedure for MoU	17-20
7	Documentation, Advocacy, Promotion and Development	21-23
8	Checklist for Evaluation	24
9	Annexure-I: Illustrative list of R&D activities for Power Generation & Transmission.	25
10	Annexure-II: Illustrative list of Project Based Performance Indicators	26-27
11	Annexure –III : R& D Performance Target Setting cum Evaluation Template	28-31

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## 1.0 RATIONALE

- 1.1 The ongoing integration of world economies has opened up an array of business opportunities and challenges to corporate firms to access new markets on the one hand and increased competition on the other. This intense competition is pushing business leaders to increasingly recognize the need to shift focus to new business opportunities. The situation has also compelled organisations in the developed world to make their operations R&D driven as they increasingly confront the risks of competing with low cost producers in emerging markets.
- 1.2 Despite substantial achievements and high levels of performance in a large number of sectors, our country has not optimally utilized its vast research potential. It urgently needs to strengthen its enormous capacity to generate knowledge and to translate that knowledge into economic and social value.
- 1.3 R&D plays an important role in the business processes that result in technology bringing new products and services to the market place. R&D results in high quality jobs, successful enterprises, better goods, services and more efficient and cost effective processes. The time is therefore, to focus on R&D for accelerating development and growth in the Corporation.
- 1.4 R&D initiatives can strengthen technological capabilities, ensure growth and address the new challenges and opportunities.
- 1.5 In MoU to be signed between NHDC and NHPC, 5% weightage out of 50% for non-financial parameters has been earmarked for R&D activities. This will, therefore, be an integral part of the performance of the Corporation.

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## 2.0 SCOPE & MEANING

- 2.1 According to the companies Act 1956, the accounts of the companies are required to be prepared in accordance with the Accounting Standard issued by the Institute of Chartered Accountants of India from time to time. The accountings of Research and Development expenses have been dealt with under the Indian Accounting standard 26. According to this, *‘Research is original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding.’*

Examples of research activities are (Reference to Institute of Chartered Accountants, Accounting Standard –26, page 42).

- a) *activities aimed at obtaining new knowledge;*
  - b) *the search for, evaluation and final selection of, applications of research findings of other knowledge;*
  - c) *the search for, alternatives for materials, devices, products, processes, systems or services; and*
  - d) *the formulation, design, evaluation and final selection of possible alternatives for new or improved materials, devices, products, processes, systems or services.*
- 2.2 Further, according to Accounting Standard 26, *‘Development’ is the application of research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services prior to the commencement of commercial production or use’.*

Examples of development activities are (Ref ICAI, AS 26 Page 46)

- a) *the design, construction and testing of pre-production or pre-use prototypes and models;*



- b) the design of tools, jigs, moulds and dies involving new technology;*
- c) the design, construction and operation of a pilot plant that is not of a scales economically feasible for commercial production;*
- d) the design, construction and testing of a chosen alternative for new or improved materials, devices, products, processes, systems or services; and*
- e) the design, construction and operation of a demonstration plant of reasonable capacity for proving the technology at commercial scale.*

2.3 Moreover, the Govt. of India has enunciated various fiscal incentives to promote R&D activities. Deductions for R&D expenses are allowed under the Income Tax Act.

2.4 According to the proposed Direct Tax Code Bill 2009, ‘*Scientific Research and Development*’ shall mean systematic investigation and search in the field of technology natural or applied science (including agriculture) if:

- a) It is carried out by a Company by means of experiment or analysis ;*
- b) It is in the nature of :*
  - (i) Basic research, namely work undertaken for the advancement of scientific knowledge without a specific practical application in view,*
  - (ii) Applied research, namely, work undertaken for advancement of scientific knowledge with a specific practical application in view,*
  - (iii) Experimental development, namely, work undertaken for the purpose of achieving technological advancement for the purpose of creating new or improving existing materials,*

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*devices, products or processes including incremental improvement thereof and*

*c) It is NOT in the nature of*

- (i) Market research or sales promotion, or*
- (ii) Quality control or routine testing of materials, devices, product or process or processes, or*
- (iii) Research in the social science or the humanities, or*
- (iv) The commercial production of a new or improved material, device or product or commercial use of new or improved process, or*
- (v) Style change, or*
- (vi) Routine data collection*

2.5 Notwithstanding the definitions mentioned in the above paras, for the purposes of MoU, the following activities shall fall within the ambit of R&D activities and may include any one or more of the following that may be relevant to the current & future business needs of the organisation. (Indicative list is given at Annexure-I)

- a) R&D activities must be original and planned and should result in new knowledge;
- b) The application of R&D should result in new/ improved products or processes or services that should be new to the company, or new to the region or new to the world;
- c) The search for knowledge may be related to product, material, device, process, system or services. It may be related to design, or new or

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alternative or improved use of materials, products, processes, systems or services;

It also includes application of research findings for new or substantially improved materials, products, processes or systems or services prior to commencement of commercial production or use which may include Setting up of demonstration / pilot plants for the first time by the organization.

### 3.0 POLICY, PLANNING AND BUDGETING.

- 3.1 To commence with implementation of R&D activities in NHDC, a Corporate R&D Policy has been prepared inline with the Corporation's Vision and Mission as per DPE Guidelines, which is as mentioned below:-

#### **NHDC CORPORATE R&D POLICY**

We, at NHDC are committed to develop the conventional & non-conventional and other renewable Energy Potential at a fast pace and generate cheap, clean and reliable power.

In order to attain this, we will strive to:

Adapt to emerging technologies and up gradation of existing technologies through continuous Research and Development.

Execute the power projects within optimum gestation period and operate the power plants with optimum resources and improved systems efficiency.

Takeup Research and Development in the areas giving thrust to protect environment, preserve ecology and socio-economic upliftment.

Continually improve by adopting prudent quality and safety practices backed by robust R & D planning.

- 3.2 Based on the R&D Policy, NHDC shall develop a Specific R&D plan. It should be prepared based on long, medium and short term as per need with clearly earmarked objectives, scope, expenditure, benefits expected, deliverables, time periods etc. It shall also include details of expected tax benefits. To achieve the objectives and goals, prioritization of R&D projects, depending on the benefits that are likely to accrue, shall be carried out.



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- 3.3 The Corporation shall get Specific R&D plan and R&D budget approved by the Board of Directors and the details of such approval are required to be submitted to the MoU Task Force at appropriate time.
- 3.4 The Specific R&D plans shall contain details about implementation as well as procedures and methodologies for monitoring results and modalities of concurrent and final evaluation. It should also specify mandatory documentation of the R&D efforts as well as results achieved. It should also, where applicable, include provisions for obtaining/ maintaining recognition of its R&D center by the Department of Scientific & Industrial Research, so that applicable tax/ duty benefits can be claimed by the Corporation.
- 3.5 Specific R&D plans should contain projects to be undertaken. The targets to be achieved against each project needs to be clearly defined. The plan should specify :
- Projects to be undertaken;
  - Activities to be undertaken for each project;
  - Budget allocated as a percentage of PAT;
  - Responsibilities and authorities;
  - Major measurable and perceivable results expected;
  - Knowledge management systems and HR issues of manpower, incentives and rewards;
  - Proposed networking with academic/research institutions, customers and vendors.
- 3.6 Projects labelled as R&D should not overlap with projects under Corporate Social Responsibility or Sustainable Development.

- 3.7 The Corporation shall formulate a procedure for identifying in-house / collaborative R&D projects.
- 3.8 Funding of R&D Projects:
- i) The R&D budget, as a percentage of Profit (PAT) keeping in mind its long term business needs and current expenditure on R&D, shall be prepared with proper justification and the expenditure on R&D as a percentage of PAT will have 50% weightage in the total marks of 5 in the MoU. Since the Corporation falls in the category of Miniratna-I & II and below, its prescribed minimum amount for expenditure under R&D will be 0.5% of Profit after Tax (PAT), as per DPE Guidelines.
  - ii) The Corporation shall make an attempt to benchmark R&D spending with internationally prevalent best practices in that sector.
  - iii) R&D budgeting for the next 3 years shall also be clearly indicated. However, the projected annual expenditure for the year under consideration will be taken as the target for the year.
  - iv) The funding of R&D budget will not lapse. It will be transferred to a R&D fund which will accumulate.
- 3.9 R&D team be empowered with adequate delegation of powers for smooth implementation of projects. The R&D Project leader be empowered to procure materials/ components/ equipment/ software tools from foreign sources as per established procedures or as decided by the Board of NHDC. Similarly, if the R&D team finds it essential to consult an expert individual/ agency/ institute after ensuring availability of the resource for desired

results, the team be empowered to hire such services/ competencies as per established procedures or as decided by the Board of NHDC. Visits to foreign universities, technical conferences for interaction / collaborative association be simplified / streamlined / facilitated. The R&D team may take travel and interact with peers on need basis as per established procedures.

- 3.10 The Corporation shall select minimum three R&D Projects to be taken as Target in the MoU.

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## 4.0 IMPLEMENTATION

- 4.1 R&D shall be developed as a ‘discipline’ in NHDC through a systematic approach.
- 4.2 Creation of mechanism / process for planning/ monitoring at the apex level to decide on R&D activities on long term / short term basis is required to be carried out. The mechanism should ensure periodic assessment of the progress of the activities. In addition, Board level designated committee on R&D headed by Independent Director as its Chairman who can meet on regular intervals shall review the progress with the R&D team.
- 4.3 The implementation of an R&D project may be based on the following procedure:
- 4.3.1 Stable & Permanent Mechanism

A mechanism / process should be created to decide the procedures for taking up R&D activities/ projects along with other parameters such as : cost, benefits expected, time period (on long term/short term) etc. The mechanism for the implementation of R&D shall be constituted in the beginning of the project. The project initiation format shall contain.

- Project description, outcome, work plan and milestones along with the time schedule.
- Project team, possible partnerships & collaborations
- Procurement plan for equipment, pilot plant, software etc
- Infrastructure, financial and manpower requirements
- Empowerment of the R&D team required to take crucial decisions
- Identification of grey/ critical areas and plan to overcome the same

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#### 4.3.2 Baseline Organizational Survey

The impact made by R&D activities should be quantified to the best possible extent with reference to baseline data, which needs to be developed by the Corporation before the start of a project. The baseline data should have information on previous work done and technologies available in similar areas.

#### 4.3.3 Project Identification

R&D project selection and funding decisions are critical if the organization is to stay in business as any wrong decision can result in the tying up of significant resources and lead to loss of both strategic and market position. In the fast changing business environment prevailing today, R&D is an investment which companies make for their future growth and sustained operation.

Thus, R&D projects shall be identified keeping in mind the business needs of the Corporation. Wherever possible, the project selected should be in – line with the core activities and the outcome of the R&D should help in achieving the long term goals of the Corporation and should yield measurable economic/ social benefits. In other words, the R&D project selected should be within the framework of the Corporation's strategic objectives and organizational structure while considering and integrating financial and strategic benefits of each project.

#### 4.3.4 Specifying outcomes

The outcome expected at the end of the project should be clearly defined before the start of the project as it would help to understand and

communicate to other how the projects and services will contribute to the broader and more enduring goals of the Corporation. However, it need not describe a programme or strategy in any real sense. Outcome is not about actions or activities, but is about the results of actions and activities.

Writing outcomes is often best handled as a group exercise among the team of people to be involved in the planning, implementation, and management of a programme. This allows various stakeholders to come together and weigh the various viewpoints and perspectives.

#### 4.3.5 Setting Timeline & Mileposts

Timelines & Mileposts are tools that could be used to help team members to know what tasks need to be achieved at each phase of the project and under what time schedule. Preparing a graphical representation is an appropriate way to provide an overview of all that needs to be accomplished in a project as well as how much time it will take to be completed.

#### 4.3.6 Collaboration & Synergizing

Activities may be undertaken by NHDC individually. Alternatively, R&D activities may be undertaken/outsourced through specialized agencies like Universities, Central organizations, i.e., CSIR, ICAR, ICMR, DRDO, DoS, DAE and other National & International Laboratories/ academic institutions, Private Companies, Labs or Institutions. Collaboration may also be taken up for the in-house project amongst different departments in the organization if the requirement so arise. For the state-of-the-art technologies for which technology base and expertise is not available in the country, the Corporation should explore collaboration with the best foreign



universities, research labs / institutions so as to compress the technology development cycle.

#### 4.3.7 Outsourcing

The purpose of R&D outsourcing is to bridge the gap in competencies/ resources required for businesses with differentiated products and systems to meet market needs. Outsourcing of essential competencies for meeting R&D project activities/ objectives should be need based. The team shall be empowered to identify and utilise all such resources.

#### 4.3.8 Incentives and Rewards

The incentives introduced by the Government of India to promote R&D include write-off of revenue and capital expenditure on R&D, weighted tax deduction on sponsored research programmes of industry with National Laboratories/ Universities/ IITs, accelerated depreciation allowance on plant and machinery which are set up based on indigenous technology, custom duty exemption on goods imported for use in Government funded R&D projects, excise duty waiver for 3 years on goods produced based on indigenous technologies and duly patented in any two countries out of India, European Union (One Country), USA and Japan.

Timely and successful completion of a project could be considered for incentives and rewards. The team leader and the members should be considered for citations and cash awards. The Corporation shall formulate schemes for giving incentives to scientists and engineers for outstanding R&D activities, like IPR (Intellectual Property Rights) – Patent filing, Publications, Commercialization of R&D process/patent/know-how, etc.

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## 5.0 MONITORING

- 5.1 A close review and monitoring of the R&D projects is very crucial and this will be done periodically by the Corporation, through a sub-committee of the Board.
- 5.2 The R&D projects undertaken by the Corporation shall be monitored and reviewed at regular intervals (half yearly). The review of the project shall be done with respect to the target set at the beginning of the project. The project report submitted for the review shall contain both physical and financial progress of the project.
- 5.3 Types of Review shall be concurrent or final, based on the activity chart of the project & its completion time. This shall include  
Concurrent Review which shall cover :
- a) Activities with-respect-to deliverables/Milestones
  - b) Need for any course change
  - c) Need for financial or networking modifications
  - d) IPR feasibility
- Final Review which shall cover:
- a) Deliverables as anticipated
  - b) Reasons for short closure or change of course
  - c) Reasons for change in budgeted expenses
  - d) Adherence to time schedule
  - e) Possibility of IPR
- 5.4 The Corporation shall develop systems/ procedures for review which may be multi-tiered, if needed.

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- 5.5 The Corporation shall incorporate a separate paragraph/ chapter in the Annual Report on the implementation of R&D activities/ Projects, including the facts relating to physical and financial progress.
- 5.6 Results of R&D activities should be recorded and reasons for failure of a project must be analysed and recorded so that the same may be used as a reference in future.

## 6.0 FILLING UP TARGET SETTING CUM EVALUATION TEMPLATE AND MARK/WEIGHT ALLOTMENT PROCEDURE FOR MOU

- 6.1 The Corporation would be evaluated under the MoU framework for its achievement in the area of R&D.
- 6.2 For this purpose, the Corporation will select Three R&D projects , ( Illustrative list of projects given at Annexure-I) at the time of submission of draft MoU to the Task Force.
- 6.3 The Corporation's actual performance vis-a-vis MoU targets on R&D will be evaluated on the basis of the following:
  - a) R&D expenses incurred and
  - b) Progress made in respect of chosen projects
- 6.4 The Corporation will submit the requisite information on R&D in the prescribed Target Setting cum Evaluation Template given at Annexure-III at the time of:
  - (i) Submission of draft MoU to the Task Force Syndicate and
  - (ii) Submission of self-evaluation report on or before 31<sup>st</sup> August each year i.e. just before MoU performance Evaluation by the Task Force.

### **During Submission of Draft MoU**

At the time of submission of draft MoU, NHDC will submit the details of approval of Specific R&D Plan and R&D Budget by Board of Directors; the Projected Annual Expenditure on R&D on a five-point scale (Excellent, Very Good, Good, Fair and Poor) (Table 1) ; Chosen Three R&D Projects ,along with one performance indicator for each and performance target

values on a five- point scale (Excellent, Very Good, Good, Fair and Poor) (Table-2).

### **During Submission of Performance Evaluation Report**

The Corporation will submit Total Expenditure, incurred on R&D and its percentage of Profit after Tax (Table 1), actual performance achievement as compared to target value in respect of performance indicator for each chosen projects (Table 2) on or before 31<sup>st</sup> August every year. In case the details of approval of Specific R&D Plan and R&D Budget by the Board of Director are not submitted, “Poor” grade will be awarded at the time of evaluation of MoU. **NHDC is not required to fill up the Score allotted for each Table as the Task Force, on consideration of actual achievement verified by Independent Expert or Research Advisory Committee of CPSE, will allot the marks on R&D during evaluation of the MoU.**

6.5 Target Setting cum Evaluation Template consists of 2 Tables, details of which are as under :

6.5.1 Table 1: Mandatory Parameter- R&D Budget as a percentage of PAT- NHDC shall indicate proposed R&D budget as a percentage of Profit after Tax (PAT) of the previous year (Refer clause 3.8 of Guidelines) at the time of submission of draft MoU. It will have a weightage of 2.5 out of 5 on R&D in MoU.

With a view to distinguish “Excellent Performance” from “ Poor Performance”, five different performance targets on a five-point scale (Excellent, Very Good, Good, Fair and Poor) shall be fixed in the MoU.

At the end of the year, during performance evaluation of MoU, the Corporation shall indicate actual expenditure incurred on R&D, as a

percentage of Profit after Tax (PAT). This should be verified by an Independent Expert or the R&D Advisory Committee.

#### 6.5.2 Table-2: Projects Chosen by the Corporation -

**Stage-1:** The Corporation shall submit Three R&D Projects: (Illustrative list of projects given at Annexure-I) at the time of submission of draft MoU to the Task Force.

The Corporation is required to indicate one performance indicator (Illustrative list given at Annexure-II), which it considers to be the most important/ vital/ key indicator for each project, at the time of submission of draft MoU.

The Corporation shall assign due weightage to each project at the time of submission of draft MoU. Total weight age for projects chosen will be 2.5 out of 5 on R&D in MoU.

**Stage 2:** During the negotiation meeting, Task Force will discuss R&D Projects and key performance indicators. With a view to distinguish “Excellent Performance” from “Poor Performance”, five different performance targets on a five-point scale (Excellent, Very Good, Good, Fair and Poor) shall be fixed in the MoU. The Task Force can add/delete/modify the R&D Projects, performance indicators, target values and weights.

After deliberations during the negotiation meetings, such projects along with target values against performance indicator (s) and weights as approved by the Task Force shall be incorporated in the MoU. However, NHDC can substitute only one project out of those agreed in MoU provided a notice indicating the intention to substitute the same is given to the Task



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Force member In-charge of R&D, Three months before the start of the project.

#### 6.6 Assessment of R&D in MoU

At the year end, the Corporation shall submit Self-Evaluation Report on R&D performance in respect of:

- (i) Actual expenses on R&D as against agreed target and as a percentage of PAT (Table 1).
- (ii) Actual achievements/milestones in respect of each R&D project/activity agreed in MoU target (Table 2).

Such Self-Evaluation Report of the Corporation shall be duly supported by a verification report of Independent Expert or R&D Advisory Committee.

#### 6.7 The Corporation shall submit the evaluation report to DPE after approval of the Board of Directors and through the Administrative Department/Ministry. The Task Force, after due scrutiny, will award the final score out of 5 on Research & Development.

## 7.0 DOCUMENTATION, ADVOCACY, PROMOTION AND DEVELOPMENT

### 7.1 National R&D Hub:

In the DPE Guidelines, creation of a National R&D Hub under the Department of Public Enterprises in conjunction with National Foundation for Corporate Social Responsibility under the Indian Council of Corporate Affairs, Ministry of Corporate Affairs and the CPSEs, has been mentioned, this Hub will undertake/ facilitate the following activities:

- i. Nation-wide compilation, documentation, and creation of database of R&D projects/ activities and initiatives of CPSEs;
- ii Advocacy;
- iii. Research;
- iv. Preparation of Panels of Implementing organizations, monitoring and evaluation agencies;
- v. Promotional activities, including production of short films, printing of brochures, pamphlets, promotional materials etc.;
- vi. National and International Conferences, Seminars, Workshops, etc. ;
- vii. Undertake/coordinate training activities connected with R&D;
- viii. Think Tanking and collaboration with external agencies to create a R&D Think Tank;
- ix. Setting up a National Data Centre;
- x. Any other activities that it deems fit for the promotion of R&D ;
- xi. Any other matter as entrusted to it from time to time by the Department of Public Enterprises (DPE).

- 7.2 This National R&D Hub will begin operations with funding provided by Department of Public Enterprise. It will, however, be free to receive fund from:
- i) SCOPE and both Central as well as State PSEs;
  - ii) UN agencies, reputed international agencies such as World Bank, EU and other multilateral bodies and organisations;
  - iii) Reputed National and State Bodies,
  - iv) Government Departments, Autonomous Organisations, Planning Commission, Attached and Subordinate Office, Corporation etc.
- 7.3 It may consider setting up a corpus fund.
- 7.4 The Corporation shall ensure that every R&D project / activity to be undertaken by them shall be communicated and listed in the central data base created by HUB. The project/activity that appears in the data base of HUB only, will be allotted mark during evaluation of the MoU.
- 7.5 Forum for Knowledge Sharing
- The Corporation shall share the experience of R&D with other related CPSEs. Efforts shall be made to conduct R&D conferences/ meets of related CPSEs on an annual basis to share the experience and knowledge gained through R&D. The R&D hub can act as information repository of past and current efforts of the Corporation, a platform for sharing of experience and best practices and a forum to foster collaboration among CPSE's, and with academic institutions.
- 7.6 Assimilation & Usage of results
- A “detailed technical report” shall be compiled by the project team. The report shall be approved by head of the unit for its contents and accuracy. The report shall be discussed with the end user (the manufacturing counterpart) for implementation. The Corporation shall synchronize

utilisation of the R&D results by arranging suitable infrastructure at its Power stations. The report, IPRs in soft form shall be available and securely archived in CPSE's Knowledge Management Portal.

#### 7.7 Propagation and Promotion

Effective Propagation and Promotion of R&D would result in improved exchange of information between the research and development community and the rest of society.

The outcome of R&D projects may be published in various journals and presented in National & International seminars/ conferences/ workshops for its commercial exploitation. Advertisement in the media may also be considered depending on the type of project. The Scientists and Engineers of R&D Dept. must be encouraged to participate and present technical papers in National & International conferences/ seminars/ workshops.

Commercial use is the main idea for popularization of the R&D results, as this will evoke the interest of new partners and increases the attention of the entire public for science and technology via outputs in the media, exhibitions, conferences, publications, etc.

Meticulous documentation of R&D approaches, policies, activities/ programmes, expenditures, procurement etc. should be done and put in the public domain (particularly through the internet) and made available to the National Hub for propagation and promotion.

- 7.8 The guidelines as amended by DPE from time to time shall be reviewed, incorporated and updation shall be carried out in the policy accordingly.

## 8.0 CHECKLIST FOR EVALUATION

<b>Checklist</b>	
<input type="checkbox"/>	Project Reference (ID)
<input type="checkbox"/>	Title
<input type="checkbox"/>	Start Date
<input type="checkbox"/>	End Date Proposed
<input type="checkbox"/>	Last Evaluation Date
<input type="checkbox"/>	Objectives, benefits and deliverables
<input type="checkbox"/>	Background & Description of the Project with list of activities
<input type="checkbox"/>	Baseline Survey
<input type="checkbox"/>	Timeline & Mileposts
<input type="checkbox"/>	Action Plan
<input type="checkbox"/>	Target achieved
<input type="checkbox"/>	Collaborations, if any
<input type="checkbox"/>	Detailed documentation on the project
<input type="checkbox"/>	Resources employed in terms of manpower & infrastructure
<input type="checkbox"/>	Budget absolute and as % of PAT
<input type="checkbox"/>	Expenditure incurred and estimated for the remaining period
<input type="checkbox"/>	Beneficiaries
<input type="checkbox"/>	Impact
<input type="checkbox"/>	Status
<input type="checkbox"/>	Outcome in terms of IPR filed, papers published etc.
<input type="checkbox"/>	Evaluation report by an independent agency

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## ANNEXURE -I

### Illustrative list of R&D activities for Power Generation & Transmission

- ❖ Alternate and New & Renewable Energy Sources.
- ❖ Climate Change Issues, waste management/ recycling and water management/conservation.
- ❖ Efficiency Improvement & Cost Reduction.
- ❖ Improving availability, reliability & safety of man & machines of the plants.
- ❖ Studies related to solutions to chronic problems of the plants.
- ❖ Energy conservation.
- ❖ Product development, Material development, Process modifications/ development.
- ❖ Reduction in Environmental impact with introduction of new technology like :
  - GIS (Reduced Space Requirement)
  - HVDC (Reduced ROW for each MW flow)
  - 1200KV (Reduced ROW for each MW flow)
- ❖ Improving transmission system efficiency.
- ❖ Increasing Equipment Life.
- ❖ Progressively optimizing land use.
- ❖ Development of monitoring & diagnostic techniques.



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## ANNEXURE -II

### Illustrative list of Project Based Performance Indicators

For each R&D Project, performance indicator is to be identified, monitored and measured to gauge actual performance of project vis-à-vis the planned performance. Illustrative list of performance indicators are as under:

1. Projected expenses vis-à-vis budget.
2. Sponsored research by NHDC or by a consortium – Expenses on sponsored research vis-à-vis benefit derived.
3. Commercialization of R&D.
4. Improvement in Efficiency.
5. New sales generated vis-à-vis Cost incurred on R&D.
6. Market share increase due to introduction of new or improved product.
7. Additional profit generated vis-à-vis Cost incurred on R&D.
8. Cost savings realized vis-à-vis Cost incurred on R&D.
9. Productivity improvements introduced vis-à-vis Cost incurred on R&D.
10. Number of technologies transferred / acquired.
11. Reduce environmental Impact.
12. Milestones achieved.
13. Increased Reliability / Availability.
14. Process development / improvement.
15. Number of IPR's (patents, copyrights, etc.) filed.

- 
16. Number of papers / publications presented / published in National / International seminars / symposium / Journals.
  17. Quality improvement.
  18. Knowledge Generation / Dissemination.
  19. Addition of New facilities / equipment
  20. Any other indicator acceptable to Task Force.

### ANNEXURE -III

#### R&D Performance Target Setting cum Evaluation Template

1. Shall be Filled and Submitted by NHDC to the Task Force prior to Annual Target Setting as well as Performance Evaluation of MoU.
2. Circuit Breaker: If NHDC has not got its Specific R&D Plan and R&D Budget passed by its Board then it will automatically be rated as “Poor” in R&D of MoU.
3. NHDC, while submitting self- evaluation report to DPE, will not fill up score allotted for each Table and the Total Score, as the same will be awarded by the Task Force at the time of performance evaluation of the MoU.

Table 1- Mandatory Parameter – Total R & D Expenditure as a percentage of PAT									
		Unit	Weightage	Performance Target					Achievement
				Excellent	V. Good	Good	Fair	Poor	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Total R&D Expenditure as % of PAT (Please refer para 3.8 (i) of the Guideline)		2.5						

Total Score for this Table	2.5
Score allotted by the task Force	

**Table 2- Projects chosen by NHDC**

**At the time draft MoU:** Every year, NHDC shall submit Three R&D projects along with one most important / vital/key Performance indicator to Task Force at the time of draft MoU. The Task Force will approve the same of add any other R&D projects alongwith performance indicator(s).

**At the time of MoU Evaluation:** The verification of achievement in respect of approved performance indicator (s) and evaluation / rating of each R&D project will be done by Independent Expert/Research Advisory Committee of CPSE. Such evaluation / rating will be considered / accepted by Task Force during evaluation for allotting MoU score on R&D.

				Target Value					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
S.N	Projects Chosen (Annexure-I)	Performance Indicator (Annexure-II)	Weightage	Excellent	V. Good	Good	Fair	Poor	Actual
2.1	Project-1	Performance Indicator							
2.2	Project-2	Performance Indicator							
2.3	Project-3	Performance Indicator							

Total Score for this Table	2.5
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Score allotted by the task Force	
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Total Score on R&D	5
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Total allotted Score for both Tables	
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## Explanatory Notes

1. Circuit Breaker: If NHDC has not got its Specific R&D Plan and R&D Budget passed by its Board then it will automatically be rated as “Poor” in R&D of MoU.
2. NHDC is not required to fill up the Score allotted for each Table as the Task Force, on consideration of actual achievement verified by Independent Expert or Research Advisory Committee of CPSE, will allot the marks on R&D of the MoU.

Table 1 – a) Columns 1 to 9 are to be filled at the time of submission of draft MoU. Column 10 is to be filled only at the time of submission of performance evaluation of MoU.

- b) Score conversion factor as defined in the MoU Guideline will be utilised for evaluation of the performance indicators. The final score will be arrived at by multiplying the weightage of indicator (expenditure on R&D as percentage of PAT) with the respective score conversion factor based on the actual performance.
- c) Expenditure on R&D projects as a percentage of PAT, mentioned at Para 3.8 will be mandatory for the Corporation with 2.5 weight out of total 5 for R&D in the MoU.

Table 2 – a) Columns 1 to 9 are to be filled at the time of submission of draft MoU. Column 10 is to be filled only at the time of submission of performance evaluation of MoU.

- b) The Corporation shall select 3 R&D projects as MoU Target (Col 2 of Table 2). The Corporation shall indicate one most important/ vital/key performance indicator against each project at the time of submission of draft MoU.

- c) Score conversion factor as defined in the MoU Guideline will be utilised for evaluation of the performance indicators. The final score will be arrived at by multiplying the weightage of each performance indicator with the respective score conversion factor based on the actual performance.
- d) Total weightage for actual achievement / milestone in respect of R&D Projects shall be 2.5.
3. MoU score conversion factors (for Table 1 and 2) on the five-point scale are 1,2,3, 4 & 5 for Excellent, Very Good, Good, Fair and Poor respectively. If actual performance is equal to or more than 'Excellent' target, raw score would be 1.00. If actual performance is equal to or less than 'Poor' target, raw score would be 5.00. If actual performance falls between 'Excellent' and 'Very good', in that case raw score would be  $1 + (\text{Excellent} - \text{Actual}) / (\text{Excellent} - \text{Very Good})$ . If actual performance falls between 'Good' and 'Fair', in that case raw score would be  $3 + (\text{Good} - \text{Actual}) / (\text{Good} - \text{Fair})$ . The raw score for the rest can be similarly calculated if the actual falls between other columns.

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