## ACKNOWLEDGEMENT

*The Management expresses and places on record its appreciation to the Ministry of Science, Technology & Research, foreign governments and funding agencies for providing facilities for training and for the financial assistance provided for the research activities. The Chairman and Board of Directors of the Centre thank all its staff members for the cooperation and assistance extended by them in the activities of the Centre.*

Eng. Shavindranath Fernando
Chairman
***NERD CENTRE OF SRI LANKA***

# CONTENTS

# 01. Acts, Legislation & Corporate Governance

National Engineering Research and Development Centre of Sri Lanka (NERDC) was established in 1974 in accordance with the provisions of the State Industrial Corporations Act No. 49 of 1957 and now it is functioning under the purview of the Ministry of Science, Technology and Research. NERDC is one of the premier institute established under the aforesaid Act with the primary objective of promoting and facilitating the Development of Domestic Engineering and Technological Research Industry. The Centre is instituted at Industrial Estate, Ekala, Ja-Ela.

## VISION

"To be a Centre of Excellence in Engineering Research and Development in the South Asia Region"

## PURPOSE

"To provide Engineering Intervention for Socio Economic Development in Sri Lanka"

## MISSION

"Engage in Research and Development activities to develop, acquire, adapt & transfer Engineering Technologies that would have a direct impact on the Socio Economic Development of Sri Lanka, while creating a culture within the organization to harness innovation and creativity of employees and stakeholders"

**The objectives of the Centre as per the Act are as follows;**

1. *To provide for the institutional mechanism needed for the progressive development of indigenous technology by encouraging, recognizing and developing innovative and creative talent in Sri Lanka.*
2. *To provide facilities to co-ordinate the technological, engineering and research capabilities of various public and private sector industries and institutions in a productive manner through co-operative endeavor.*
3. *To ensure by adoption and adaptation the choice of technologies that would be consistent with the country's resource endowments and national planning objectives.*
4. *To examine direct and indirect mechanism of technology transfer and offer counsel to appropriate government and private institutions in Sri Lanka, when required to do so.*
5. *To promote the optimal exploitation of the country's human and material resources, particularly labor and raw material resources by promoting the growth of suitable technology.*
6. *To design, manufacture, and test prototype machinery, pilot plants as demanded by Industrial, commercial and other end users in an economical manner.*
7. *To provide for continuous monitoring of technological data and documentation relating to engineering designs and research through the co-operation of international and national agencies.*
8. *To offer sustained consultancy services to public and private sector enterprise and undertake research and promote training activities to broaden the base of the country's engineering and industrial design and research capabilities.*
9. *To make provision for purpose connected with engineering, research and development related to matters aforesaid.*

# 02. Board of Directors and Organization Structure

## CHAIRMAN

01. Eng. W J L S Fernando (Since 03.05.2016)
B Sc(Hon)Eng., M Eng, FIESL, MIET, C Eng.

02. Dr. T A G Gunasekera (up to 03.05.2016)
M Eng(SL), M Sc(Hon) (Ire), PhD(Ire), MIE(SL), FIIE(SL), C Eng. I Eng.

## MEMBERS OF THE BOARD

1. Eng. E A S K Edrisinghe
C.Eng., MIET
2. Mr. G Chandrasiri
B Com Degree
3. Mr. A S R Waidyasekera
MBA(PIM-USJ), Chartered Marketer
4. Eng. A S Samarasinghe
C.Eng
5. Mrs. Niluka Kumari
Master of Business Studies, CBA
6. Mr. A H M Anvar

## Director General/ Sectretary to the Board

Eng. D D Ananda Namal
M Eng (Energy Technology), Bsc Eng (Hons), C Eng, MIE(SL)

**OFFICE ADDRESS**

2P/17 B, Industrial Estate
Ekala
Ja-Ela

**POSTAL CODE**

11380

**CONTACT INFORMATION**

**+ 94-011-2236284**
**+ 94-011-2236384**
**+ 94-011-2236307**
**+ 94-011-5354597**

**+ 94-011-2233153**

nerdcentre@nerdc.lk

www.nerdc.lk

**BANKERS**

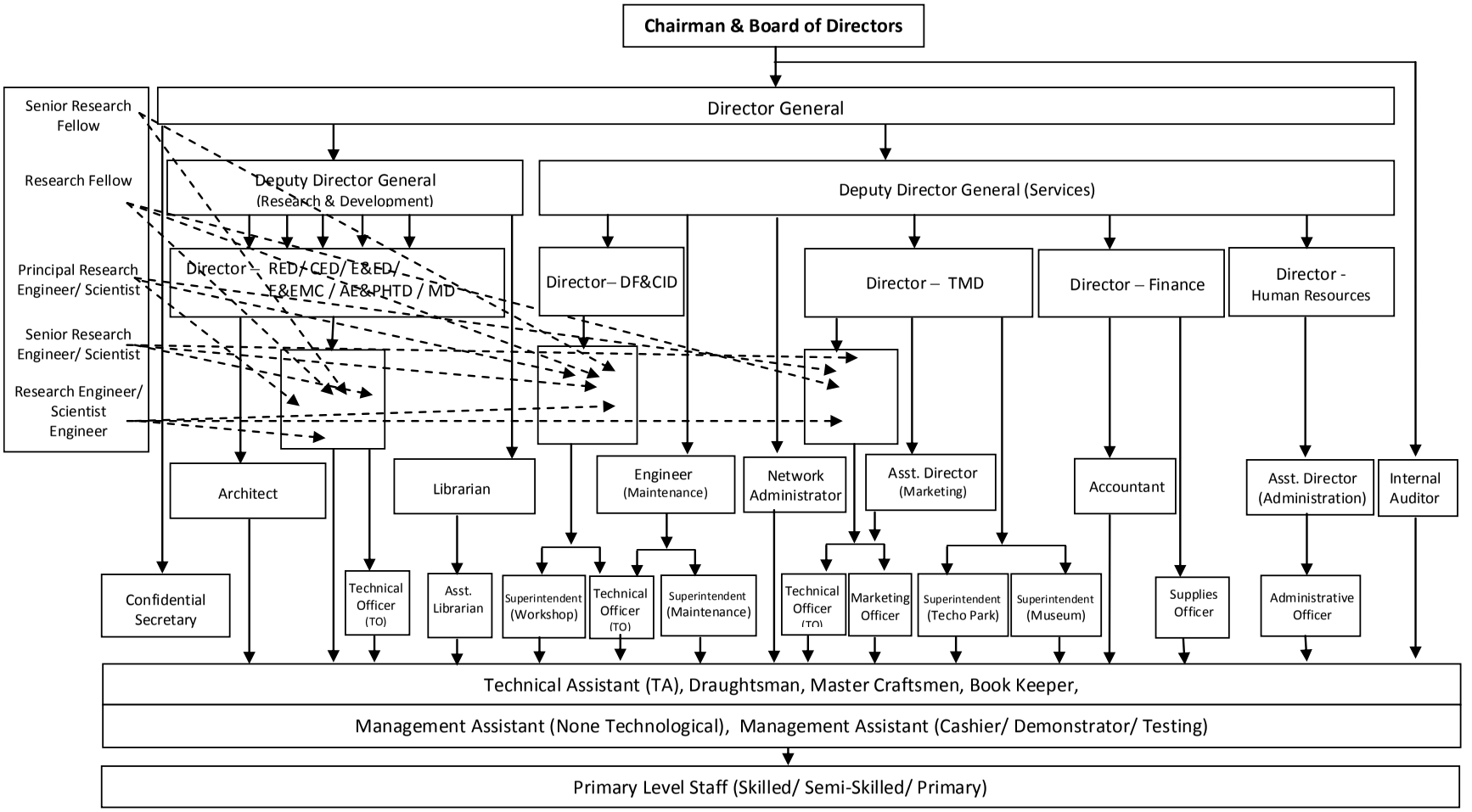
- **Bank of Ceylon, Ja-Ela**
- **Bank of Ceylon,**
- **Corporate Branch**

**AUIDITOR**

**Auditor General**
**Auditor General's Department**

# NATIONAL ENGINEERING RESEARCH & DEVELOPMENT CENTRE OF SRI LANKA

## Organization Structure as per the Scheme of Recruitment (SOR) approved




**Departments/Divisions**

| | | |
|---|---|---|
| RED | - | Renewable Energy Department |
| CED | - | Civil Engineering Department |
| E&EMC | - | Energy & Environment Management Centre |
| EED | - | Electrical & Electronic Engineering Department |
| AE&PHT | - | Agriculture Engineering & Post Harvest Technology Department |
| DF&CID | - | Design Fabrication & Consultancy Service for Industries Department |
| TMD | - | Techno Marketing Department |
| MD | - | Mechatronics Division |

**Service Category**

| | | |
|---|---|---|
| HM | - | Senior Manager |
| AR 2 | - | Academic/ Research |
| AR 1 | - | Senior Academic/ Research |
| MM | - | Manager ` |
| JM | - | Junior Manager |
| MA 2-2 | - | Management Assistant (Technological) |
| MA 1-2 | - | Management Assistant (Non-Technological) |
| PL 3 | - | Primary Level (Skilled) |
| PL 2 | - | Primary Level (Semi-Skilled) |
| PL 1 | - | Primary Level (Un-Skilled) |

# 03. Chamian's Message

It gives me pleasure to review the performance of the National Engineering Research and Development Centre of Sri Lanka (NERDC), premier Engineering Research and Development organization in the country.

The NERDC has continued to serve the nation in the year 2016 and many stakeholders and the country in general have reaped economic and social benefits from the inventions, products, technologies and services rendered by the Centre. In terms of providing self-employment opportunities based on new technologies, NERDC has played a key role. Improving productivity and efficiency of industries, saving resources is another area NERDC was very active in the year 2016. NERDC continued its effort in enriching capacity of inventors and disseminating science and technology knowledge among school children and general public.

NERDC cost effective building technologies have always been the forerunner among NERDC Research and Development efforts in the field of Civil Engineering. In 2016 the Centre has introduced technology for cement sand roofing tile as an alternative for the corrugated asbestos roofing sheet and also the traditional Calicut tile. Pre stressed precast concrete panels for retaining walls, "L" shaped precast pre stressed concrete steps, cost effective roof framework and cement stabilized compressed soil blocks introduced by the Centre has resulting in reduced cost, time of construction and resources used in the construction industry.

Technical hand book on cost effective construction technologies for building construction including all standards and specifications was launched in 2016. This would be a great source of information for all stake holders who wish to apply cost effective construction technologies in their civil construction.

Key research and development activities of the Centre in the year 2016 were development of machines to remove weeds in irrigation canals for efficiency of water conveyance and the use of the same in tanks for breeding freshwater fish, machinery for coconut industry, smoked fish processing unit, re-engineering of milking machine, further development of semi-automatic hopper machine. The Centre developed and fabricated a hyperbaric oxygen chamber, mechanization of construction of slip form wall, universal data acquisition module for process control and building management system and smart parking system.

Construction of footbridges and a compact wastewater treatment plant were the pilot projects completed in the year 2016. Fabrication of machinery for Ayurveda sector and development and fabrication of handloom fabric inspection machine for handloom industries were commercial projects completed in 2016 based on NERDC developed technologies.

The NERD Centre has built up competence in several thrust areas to provide unique and complete professional service to the industry. Energy and Environmental Management is a fully-fledged professional service that provide audit and certification service to the local industry. The demand for our services is ever increasing. More than 1000 industries and commercial establishments have obtained this service. This year Centre obtained ISO "17025 Accreditation" for "Waste Water Testing" and "Noise Level Measurement" in our quest for continuous improvement of laboratories aimed at better services to the industries and clients.

In addition, NERDC was involved in a number of consultancy work in all aspects of main engineering disciplines such as civil, electrical and electronic, energy and environmental management, agriculture engineering and post-harvest technologies in order to cater to the demand from many industries. Various technical services have been rendered for both large and small scale industries in precision machining, engineering designing and fabrications, industrial process monitoring and solutions, laboratory testing, environmental management, construction, etc. The Centre conducted special training programmes for groups of people in industries in different areas such as energy and environmental management system, NERDC developed technologies, entrepreneurship development, programmable logic controller programming, industrial instrumentation, control systems, industrial applications, automation and health and safety etc.

Technology transfer is another activity of NERDC and 17 technology transfers and 59 license renewals have been successfully done in the year 2016. NERDC carried out several popularization programmes to raise awareness on NERDC developed technologies in the year 2016. The annual NERDC Open Day Engineering and Technology Exhibition were organized in November 2016. This was an activity where demonstration of different technologies was carried out for the general public. The NERDC Research Symposium was also held to coincide with the National Science Week in 2016. Furthermore, NERDC arranged a number of media programmes in 2016 for technology popularization.

The NERDC's mission to engage in Research and Development activities to develop, acquire, adapt and transfer Engineering Technologies that would have a direct impact on the Socio Economic Development of Sri Lanka has not always been easy because of the serious issue in recruiting and retaining capable research engineers within the Centre due to low remuneration schemes for engineers in the State R &D institutions. However, the Centre has always attempted to provide more capacity building programmes for its staff both local and overseas as a strategy to motivate and retain them to meet the future challenges of the Centre. Yet it is time that policy makers take a serious note in adopting a policy to reward engineers of government research institutions with an attractive remuneration scheme, so as to upgrade the Research and Development activities at these institutions which is the key to spur the knowledge economy.

For functioning of all the above and upgrading the Centre to be a premier engineering research and development organization in the country, the leadership given by Eng. D.D. Ananda Namal, Director General of the Centre is most admirable. It has been a great pleasure working with him in directing and leading the Centre's functions successfully. I also wish to take this opportunity to thank, members of the Board of Directors including Higher Management, the Directors, Heads of the Departments/Divisions, research staff, technical staff and other support staff of the Centre for the services rendered by them to achieve the objectives of the Centre in the year 2016.

Eng. W J L S Fernando
CHAIRMAN

# 04. Top Management and Executive Staff

## CHAIRMAN

01. Eng. W J L S Fernando (Since 03.05.2016)
B Sc(Hon)Eng., M Eng, FIESL, MIET, C Eng.

02. Dr. T A G Gunasekera (up to 03.05.2016)
M Eng(SL), M Sc(Hon) (Ire), PhD(Ire), MIE(SL), FIIE(SL), C Eng. I Eng.

## DIRECTOR GENERAL

Eng. D D Ananda Namal
M Eng (Energy Technology), Bsc Eng (Hons), C Eng, MIE(SL)

## DEPUTY DIRECTOR GENERAL (RESEARCH & DEVELOPMENT)

Eng. G K K A De Silva
Msc (Building Technology), Bsc Eng (Hons), C Eng, MIE (SL)

## DEPUTY DIRECTOR GENERAL (SERVICES)

Mr. A H Piyasiri
Msc (Management of Technology), Bsc Eng (Hons)

## EXECUTIVE STAFF IN DEPARTMENT WISE

### Agriculture Engineering & Post-Harvest Technology Department (AE & PHT)

**Director (Technical)**
Eng. K Y H D Shantha
MSc Eng., BSc Eng, AMIE(SL)

**Principal Research Engineer**
Mrs. Y M M K Ranathunga
NDT

Eng. A J G S Dahanayake - from 01.04.2016
BSc Eng, C Eng, MIE(SL)

**Principal Research Scientist**
Dr. K M W Rajawatta
PhD, MSc, BSc.

**Senior Resarch Engineer**
Eng. P M Y S Pathiraja
BSc Eng, MSc, AMIE (SL)

**Resarch Engineer**
Eng. S A P Shalinda Silva
BSc Eng, AMIE (SL)

Mr. K D S Premakumara - up to 23.03.2016
BSc Eng

Eng. P F Suren - up to 01.12.2016
BSc Eng, AMIE(SL)

**Engineer**
Mr. P A U W K Paranagampola
NDES

### Civl Engineering Department (CED)

**Director Technical**
Eng. J A C Chrishanthi
BSc Eng, C Eng, MIE(SL)

**Principal Research Engineer**
Eng. W W P K Perera
M ENG (STRUCT), BSC ENG (HONS), C ENG , MIE (SL)

Eng. W P R D Weerasinghe
NDT, CEI PART I, IESL PART I

**Engineer**
Ms. D M W K Digala
NDES (Civil Eng), CEI (UK) Part I

Ms. K S S Weerasinghe
Special Apprentice (Civil Eng.), IESL (Part I)

**Resarch Engineer**
Eng. I P Batuvita
B Sc Eng, AMIE(SL)

Eng. A N S Amaradasa
B Sc Eng, AMIE(SL)

**Architect**
Mr. B D R Chamika
MSc, B Sc

| Renewable Energy Department | Electrical & Electrical Engineering Deparment |
|---|---|
| **Research Fellow (Head of Department)**<br>Eng. J A A D Jayasuriya<br>M Eng, BSc Eng, MIE(SL) | **Research Fellow (Head of Department)**<br>Eng.(Ms) N G D Wijesiriwardhana<br>M Eng, C Eng, MIE (SL) |
| **Research Fellow**<br>Eng. W K R Peiris<br>MA (Buddhist Stud), BSc Eng, C.Eng. MIE(SL)<br>Eng. E A N K Edirisinghe<br>MPhil, BSc Eng, MIE(SL)<br>**Principal Research Engineer**<br>Dr. A S K Warahena<br>PhD, M Eng, B Sc Eng<br>**Research Engineer**<br>Ms. E B U C Kumara<br>BSc Eng (Hons)<br>Ms. E Nadeeshani - up to 07.10.2016<br>BSc Eng (Hons)<br>Eng. (Ms) G S R Costha<br>BSc Eng, AMIE(SL)<br>Eng. N M J S Nissanka<br>BSc Eng, AMIE(SL)<br>**Engineer**<br>Mr. W A L S Karunawardhana<br>HNDE | **Senior Resarch Engineer**<br>Eng. U C Botheju - from 04.04.2016<br>MSc., BSc Eng. AMIE(SL)<br>**Research Engineer**<br>Eng. (Ms) D R S K Wimalaratne<br>BTech Hons, AMIE(SL)<br>Ms. Y M A G S P K Kularatne<br>BSc Eng<br>Eng. Y S P Weerasinghe - from 01.02.2016<br>BSc Eng. AMIE(SL)<br>Eng. (Ms) H C Ganege - from 01.12.2016<br>BSc Eng. AMIE(SL)<br>**Engineer**<br>Ms. H D C Hettiarachchi<br>NDT |
| **Design Fabrication & Consultancy for Industry Department (DF & CI)** | **Energy & Environmental Management Centre** |
| **Director -Technical**<br>Eng. A A S P Jayasinghe<br>BSc Eng (Hons), MBA, MIE(SL) | **Research Fellow/ Head of Department**<br>Eng. K T Jasinghe<br>M Eng, BSc Eng, C Eng, MIE(SL) |
| **Principal Research Engineer**<br>Eng. H M L U Herath<br>BSc Eng, AMIE(SL)<br>Eng. A R C Salgado<br>BSc Eng, AMIE(SL)<br>**Research Engineer**<br>Eng. P S Perera<br>EC (UK) Part I & II, NDT, AMIE(SL)<br>**Engineer**<br>Mr. N A D D J Prasanna<br>NDT<br>**Supirentendent – Workshop**<br>Mr. W H S Ramal Silva<br>NDES | **Senior Resarch Engineer**<br>Eng. (Ms.) N P T Perera<br>MSc, BSc Eng (Hons.), AMIE(SL)<br>Eng. (Ms.) A G M T Siriwardhana<br>MSc, MEng, BSc Eng., AMIE(SL)<br>Dr. (Ms.) S M Youg<br>PhD, M Phil, MSc, BSc.<br>**Research Engineer**<br>Eng. M D Sahardeen<br>BSc Eng, AMIE(SL)<br>Eng. K P D D Jayasekera<br>BSc Eng (Hons), AMIE(SL)<br>Eng. T K Geeganage<br>BSc Eng. AMIE(SL) |

| Techno Marketing Department | Mechatronics Section |
|---|---|
| Director - Technical<br>Eng. M A M Fernando<br>PG Dip (Energy) IESL Part I & II, CEng, MIE (SL) | Principal Research Engineer<br>Eng. D M Punchibanda<br>BSc Eng, AMIE(SL) |
| Principal Research Engineer<br>Mr. D V Wimalasena<br>NDT, Dip in Marketing (SL)<br><br>Markeing Officer<br>Mr. S Wijesuriya<br>MBS, BSc (Agriculture) Sp.<br><br>Research Scientist<br>Ms. B D P S Ranaweera - from 01.06.2016<br>MSc, BSc<br><br>Supirentendent<br>Mr. A A N S Adikari<br>BSc | Senior Research Engineer<br>Eng. P H H Kumara<br>MSc Eng, EC(UK) PART I & II, AMIE(SL)<br><br>Research Engineer<br>Eng. (Ms) M A N Sugandi - up to 02.05.2016<br>B Tech, AMIE (SL)<br>Ms. L N A Perera - up to 31.07.2016<br>BSc Eng. (Hons)<br>Eng. S M S S Senaratne<br>B Tech, AMIS(SL)<br>Eng. G M P M Rajakaruna - from 01.12.2016<br>BSc Eng, AMIE(SL)<br>Eng. W M S P K wanasinghe - from 05.12.2016<br>BSc Eng, AMIE(SL) |
| **Human Reseources Department** | **Finance Division** |
| Director (Human Resources)<br>Ms. D A M Munasinghe<br>BSc (HRM), MBA (HRM), AM(IPM) | Director – Finance<br>Ms. D V S Perera<br>ICMA Professional Part II, IPFA, ICEA |
| Assistant Director (Administration)<br>Mr. R Gamage<br>B A (Social Sc.) Sp., MA in Sociology | Accountant<br>Mr. J M R S Jayasinghe<br>BBA (Busi. Admin) Sp. , MBA, ICASL - Professional Part I |
| **Information Technology Unit** | **Library** |
| Network Administrator<br>Mr. B P Wickramasuriya<br>BSc (Computing & Infor. Systems) | Libririan<br>D M T P K Dewagiri<br>B A (Library Science) Sp., MSSc, ASLLA |
| **Internal Audit** | **Supplies** |
| Internal Auditor<br>Mr. B P Susantha<br>HNDA | Supplies Officer<br>Mr. R H A Jeewananda<br>BSc (Physical Science) |

# 05. Human Resources

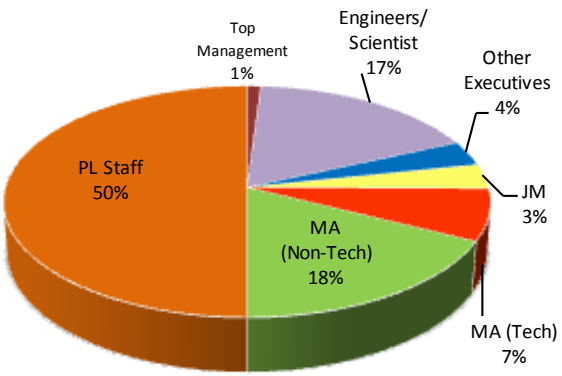
Human resource is the key asset of Research & Development organizations in accomplishing its goals and objective through performance excellence. It is Human Resource that make things happen while all the other resources make things possible. In NERDC, the management makes much effort to direct, utilize and develop its human resources in the most effective and efficient manner.

However, the major problem identified in Human Resource Management (HRM) within the Centre is the recruitment and retaining of competent Engineering researchers. This is identified as a very common issue in most of the research organizations in Sri Lankan State sector. A comprehensive integrated strategy is thus required to address this issue, such as national policy on Engineering /scientists researchers programming, research application for national development and recruitment, incentives, rewards, recognitions, capacity development of researchers/scientists, etc. specially in Engineering field.

Despite the difficulties of recruiting and retaining capable Engineers within the Centre due to the repeatedly mentioned issues in remuneration schemes, NERDC has taken all its measures to recruit and retain Engineering staff through offering attractive capacity development opportunities as a strategy. NERDC provides a wide range of capacity development opportunities for its Engineers/ Scientists within the capacity and limitations of the Centre and Higher studies, training and development, international exposures, creating facilitating environment, assisting carrier development, etc. are some of such strategies undertaken by NERDC.

## Summary Information of Staff Strength

| Staff Category | Nos |
|---|---|
| Top Management | 3 |
| Engineers/ Scientist | 50 |
| Other Executives | 10 |
| Junior Managers | 10 |
| Management Assistants (Tech) | 21 |
| Management Assistants (Non-Tech) | 51 |
| Primary Level (PL) Staff | 145 |
| **TOTAL** | **290** |



## 5.1 Cadre Management

### 5.1.1 New recruitments during the year 2016

| No. | Name | Designation | Date |
|---|---|---|---|
| 1 | Mr. Y S P Weerasinghe | Research Engineer | 01/02/2016 |
| 2 | Mr. S W A K T Samarwikrama | Technical Assistant | 01/02/2016 |
| 3 | Ms. A G M T Siriwardane | Senior Research Engineer | 01/03/2016 |
| 4 | Mr. R M R S Wijebandara | Electrician | 01/03/2016 |
| 5 | Mr. J P J Jayawickrama | Mould Maker | 01/03/2016 |
| 6 | Mr. M D H Fernando | Electrician | 08/03/2016 |
| 7 | Mr. M S Y V K Perera | Labourer | 10/03/2016 |
| 8 | Eng. A J G S Dahanayake | Principal Research Engineer | 01/04/2016 |
| 9 | Dr.(Mrs). K M W Rajawatte | Senior Research Scientist | 01/04/2016 |
| 10 | Mr. U C Botheju | Senior Research Engineer | 04/04/2016 |
| 11 | Ms. B K A Dharmarathne | Management Assistant-Non Tech | 05/04/2016 |
| 12 | Ms. R S Priyadharshani | Management Assistant-Non Tech | 05/04/2016 |
| 13 | Mr. K A C Madhusanka | Machinist | 05/04/2016 |
| 14 | Ms. M N Madhushani | Management Assistant-(Demo.) | 05/04/2016 |
| 15 | Ms. Thilini Wijekoon | Management Assistant-(Testing) | 05/04/2016 |
| 16 | Mr. M D O G Senanayake | Management Assistant-(Testing) | 05/04/2016 |
| 17 | Ms. P H S L Dhanapala | Draughts Person | 05/04/2016 |
| 18 | Mr. G L Devasurendra | Draughts Person | 05/04/2016 |
| 19 | Mr. A R A S S Kasthurirathne | Electrician | 05/04/2016 |
| 20 | MR. H P L Sudesh | Driver | 05/04/2016 |
| 21 | Dr.(Ms) S M Young | Senior Research Scientist | 25/04/2016 |
| 22 | Mr. K S K B M R A B Lenawala | Superintendent - Maintenance | 16/05/2016 |
| 23 | Mr. W Naveendra Prasad | Labourer | 16/05/2016 |
| 24 | Mr. G A G P S K Godapola | Driver | 25/05/2016 |
| 25 | Mr. N M I D Nawarathne | Technical Assistant | 01/06/2016 |
| 26 | Mr. Dinushan Nayanajith | Office Aide | 06/06/2016 |
| 27 | Mr. Sameera Sanjaya | Vehicle Attendant | 06/06/2016 |
| 28 | Mr. Sameera Senevirathne | Tool keeper | 06/06/2016 |
| 29 | Mr. Sanjaya Niroshana | Tool keeper | 06/06/2016 |
| 30 | Mr. G M Sangeeth | Library Attendant | 06/06/2016 |
| 31 | Ms. B I G I Madhushani | Management Assistant - Testing | 06/06/2016 |
| 32 | Ms. K T Piyumali | Technical Assistant | 01/07/2016 |
| 33 | Mr. B D T K Priyankara | Machinist | 01/07/2016 |
| 34 | Mr. E A Prasad Chathuranga | Machinist | 01/07/2016 |
| 35 | Ms. A Manjula Damayanthi | Office Aide | 01/07/2016 |
| 36 | Mr. M D P S K Jayathilaka | Draughtsman | 04/07/2016 |
| 37 | Mr. H M S ShanthaHerath | Technical Assistant | 14/07/2016 |
| 38 | Ms. D M T Verginiya | Management Assistant | 15/07/2016 |
| 39 | Mr. P C N P Perera | Management Assistant | 16/10/2016 |
| 40 | Ms. H C Ganege | Research Engineer | 01/12/2016 |
| 41 | Mr. G M C M Rajakaruna | Research Engineer | 01/12/2016 |
| 42 | Mr. P F Suren Perera | Research Engineer | 01/12/2016 |
| 43 | Mr. H D H Hirantha | Fitter | 01/12/2016 |
| 44 | Mr. G S Samannath | Mason | 01/12/2016 |
| 45 | Mr. W M S P K Wanasinghe | Research Engineer | 05/12/2016 |
| 46 | Mr. N M J S Nissanka | Research Engineer | 14/12/2016 |
| 47 | Mr. E G Dilan Suminda | Machinist | 14/12/2016 |

### 5.1.2 Retirements

| No | Name | Designation | Date |
|---|---|---|---|
| 1 | Mr. M N R Dharmasekara | Electronics Technician | 10/02/2016 |
| 2 | Mr. H Sunil Perera | Driver | 16/05/2016 |
| 3 | Mr. J B Shelton Dias | Welder/Fitter | 30/05/2016 |
| 4 | Mr. S H A Somaweera | Labourer | 06/06/2016 |
| 5 | Mr. W A Weerasinghe | Fitter | 01/07/2016 |
| 6 | Miss. R K Waidyasekera | Administrative Officer | 27/07/2016 |
| 7 | Mr. A Amarasooriya | Management Assistant | 15/09/2016 |
| 8 | Mr. K A Gunaratne | Asst. Supplies Officer | 02/11/2016 |

### 5.1.3 Resignations

| No. | Name | Designation | Date |
|---|---|---|---|
| 1 | Ms. N P A Gamage | Technical Assistant | 01/03/2016 |
| 2 | Mr. K D S Premakumara | Research Engineer | 23/03/2016 |
| 3 | Mr. K R A S S Kasthurirathne | Electrician | 11/04/2016 |
| 4 | Ms. M A N Sugandi | Research Engineer | 02/05/2016 |
| 5 | Mr. G L Devasurendra | Draughtsman | 16/05/2016 |
| 6 | Mr. P Basil Silva | Carpenter | 18/07/2016 |
| 7 | Mr. S W A K T Samarwickrama | Technical Assistant | 28/07/2016 |
| 8 | Ms. A L N Apsara Perera | Research Engineer | 31/07/2016 |
| 9 | Ms. I S Dikkumbura | Technical Assistant | 07/09/2016 |
| 10 | Ms. H D Maduwanthi | Technical Assistant | 19/09/2016 |
| 11 | Ms. E Nadeeshani | Research Engineer | 07/10/2016 |
| 12 | Mrs. A A Lakmali | Management Assistant | 08/10/2016 |
| 13 | Mr. H W J Nimalarathne | Labourer | 07/11/2016 |
| 14 | Mr. A N M C N Abesiri | Research Engineer | 14/11/2016 |

### 5.1.4 Internal Recruitment

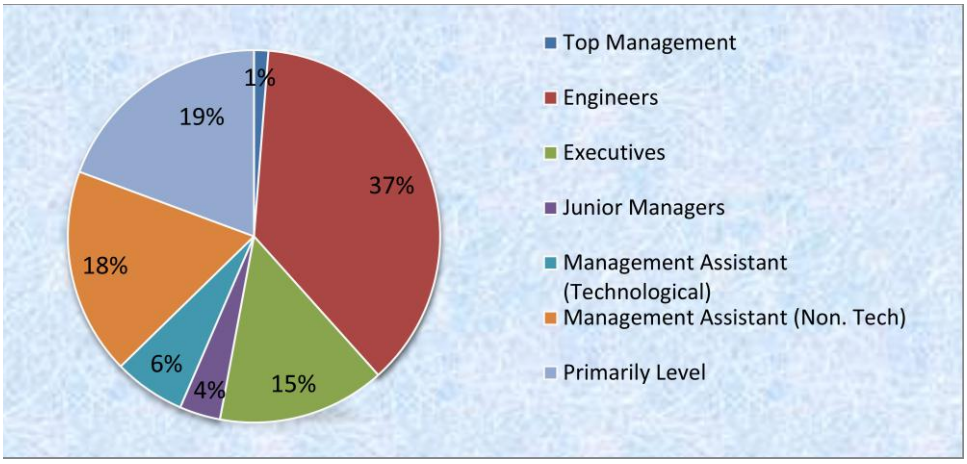
| NO | Name | Previous Post & Category | Recruited Post& Category | Date |
|---|---|---|---|---|
| 1 | Eng. N P T Perera | Research Eng. Gr. I (AR-1) | Senior Res. Engineer (AR-2) | 01/03/2016 |
| 2 | Eng. P M V S Pathiraja | Research Eng. Gr. I (AR-1) | Senior Res. Engineer (AR-2) | 01/12/2016 |
| 3 | Ms. B D P S Ranaweera | Superintendent (JM 1-2) | Research Scientist (AR-1) | 01/03/2016 |

## 5.2 Staff Training & Development

Since the Key role of the NERDC is engineering research and development, constant concern is tendered in human resources development by the management. Accordingly all steps are taken to enhance knowledge, skills and competencies with correct attitudes in all categories of the staff having purposes of obtaining efficient and effective service to the Centre and career development of the staff.

**5.2.1 Capacity building and skills development training opportunities provided in 2015 are as follows.**

| Service Category | Nos. of Training Facilities Provided |
|---|---|
| Top Management | 7 |
| Engineers | 209 |
| Executives | 82 |
| Junior Managers | 20 |
| Management Assistant (Technological) | 35 |
| Management Assistant (Non. Tech) | 101 |
| Primarily Level | 109 |
| **Total** | **563** |




### 5.2.2 Outbound Training Programs

Two (02) days Residential Outbound Training Program was conducted at Technology Park for newly recruited employees above Management Assistant Category on 20th and 21 July 2016. 31 staff members participated at the above programme.

### 5.2.3 Facilattion for Higher Studies

| Professianal Quatlifiactions Obtaining | | | | |
|---|---|---|---|---|
| **No** | **Name & Designation** | **Program** | **Institution** | **Complete date** |
| 01 | Eng. P M Y S Pathiraja | M.Sc/PG Diploma Course in Sustainable Process Eng. | University of Moratuwa | 01/07/2016 |

| Higher Studies Started | | | | | |
|---|---|---|---|---|---|
| | **Name & Designation** | **Program** | **Institution** | **Started Date** | **Date to be completed** |
| 01 | Ms. G S R Costha<br>Research Engiener | M.Eng./PG Diploma Pro.in Energy Technology | University of Moratuwa | 06/02/2016 | 05/02/2018 |
| 02 | Mr. R Gamage<br>Asst. Director (Admin) | Master in Labouer Relations and Human Resources Management - 2016/17 | University of Colombo | 01/06/2016 | 31/05/2018 |
| 03 | Ms. B D P S Ranaweera<br>Research Scientist | M.Sc Degree Programme in Industrial and Environmental Chemistry 2016/18 | University of Kelaniya | 18/06/2016 | 17/06/2018 |
| 04 | Mr. B P Wickramasuriya<br>Network Administrator | M.Eng./PG Diploma in Information Tech. -2016 | University of Moratuwa | 22/10/2016 | 21/10/2018 |
| 05 | Mr. K P D D Jayasekera<br>Researche Engneer | M.Eng./PG Diploma in Environmental Eng. & Mgt. | University of Moratuwa | 21/10/2016 | 21/10/2018 |

| Higher Studies Ongoing | | | | | |
|---|---|---|---|---|---|
| | **Name & Designation** | **Program** | **Institution** | **Started Date** | **Date to be completed** |
| 01 | Mr. B P Susantha Kumar<br>Internal Auditor | MPM Programme | SLIDA | 28/02/2015 | 27/02/2017 |
| 02 | Mr. I P Batuvita<br>Research Engineer | PG Diploma/M.Eng in Highway &Traffic Eng. | University of Moratuwa | 24/07/2015 | 23/07/2017 |
| 03 | Mr. S M S Senanayake<br>Research Engineer | M.Sc/PG Diploma Course inIndustrial Automation | University of Moratuwa | 24/10/2015 | 23/10/2017 |
| 04 | Mr. T K Geeganage<br>Research Engineer | M.Sc/PG Diploma Course in Sustainable Process Eng. | University of Moratuwa | 05/12/2015 | 04/12/2017 |
| 05 | Mr. A A N S Adikari<br>Supirentendent – Technolgoy Park | MBA Degree (Master of Business Administration) | University of Colombo | 28/11/2015 | 27/11/2017 |

| Charter Qualifications Obtained | | | | |
|---|---|---|---|---|
| **No** | **Name & Designation** | **Member/Associate Member of Charter** | **Institution** | **Date Obtained** |
| 01 | Eng. E A N K Edirisinghe<br>Research Fellow | Member of Charter | IESL | 20/5/2016 |
| 02 | Eng. T K Geeganege<br>Research Engineer | Associate Member of Charter | IESL | 16/06/2016 |
| 03 | Eng. W M S P K Wanasinghe<br>Research Engineer | Associate Member of Charter | IESL | 01/07/2016 |
| 04 | Eng. J A A D Jayasuriya<br>Research Fellow | Member of Charter | IESL | 07/10/2016 |
| 05 | Eng. A A S P Jayasinghe<br>Director (TMD) | Member of Charter | IESL | 07/10/2016 |

| 5.3 Participation for Foreign Training / Workshop / Seminars / Symposiums | | | | |
|---|---|---|---|---|
| **No** | **Name & Designation** | **Name of the Program** | **Country** | **Period** |
| 01 | Eng. G K K A De Silva<br>DDG(R&D) | 2016 Seminar on Science and Technology Innovation for Developing Countries | China | 26 May - 15 June 2016 |
| 02 | Eng. D D A Namal<br>Director General | The 2nd forum on China- South Asia Technology Transfer and Collaborative Innovation | China | 12-14 Jun.2016 |
| | | Twelth Session of the Governing Council of APCTT and the high-level International Conference on Innovation Strategies for Sustainable Development | Pakistan | 19-21 Dec.2016 |
| 03 | Eng. T K Geeganage<br>Research Engineer | International Workshop on China-South Asia Technology Manager Training | China | 04-23 Aug. 2016 |
| 04 | Eng. S A P S Silva<br>Research Engineer | International Workshop on China-South Asia Technology Manager Training | China | 04 – 23 Aug. 2016 |
| 05 | Eng. A A S P Jayasinghe<br>Director-DF&CI | International Training Workshop on Business R & D Building from the perspective of GVC | China | 04-23 Sep. 2016 |
| 06 | Eng. K T Jayasinghe<br>Research Fellow | Multicounty Observational Study Mission on Advanced Energy Technology | Iran | 01-05 Oct 2016 |
| 07 | Eng. W J L S Feranando<br>Chairman | International Convention of Science, Technology and Innovation | Cuba | 31 Oct.-04 Nov. 2016 |
| 08 | Mr. W A L S Karunawardena<br>Engineer | Evolving Energy Models in Emerging Economies – Post COP 21 | India | 12-14 Dec. 2016 |

## 5.4 In House Training Programs organized

| No | Program Name | Period | For Whom | No of Participant |
|---|---|---|---|---|
| 01 | Training on ISO 17025:2005 | 2016/02/06,17,18 | Relevant Eng/Sci/TA in RED/EMCM/E&E/Civil | 17 |
| 02 | Thinking Outside the Box | 2016/04/29 | Eng/Sci/Other ExecutivesTO/TA/MA | 89 |
| 03 | Workshop on results based management & organizational result frame work | 2016/07/13,14 | Eng/Sci/Other executives | 57 |
| 04 | In house Motivational training program – NO I Can't yes I Can | 2016/09/19 | PL1 & PL3 | 100 |
| 05 | Workshop on professional presence | 2016/10/03 | HM/AR/MM/JM/MA-Demo | 65 |
| 06 | In house Motivational training program – NO I Can't yes I Can | 2016/11/08 | MA & Above service categories | 87 |

## 5.5 Other Corporate Social Responsiblities - 2016

**Industrial Training Facilities for trainees**

NERDC provided in plant training opportunities for a period of 6 months/ 3 months for 32 nos. of trainees who were directed by National Universities and Training Institutions in the year 2016.

# 06. Performance highlights of the year 2016

The National Engineering Research and Development Centre has involved in research and development activities, training and development activities, construction activities, consultancy services and services to industries focusing to provide maximum contribution for upgrading country economy, improving of living standard of the people and improving the both efficiency and productivity of the industries. As a result, NERDC was able to introduce new technologies and products, more opportunities for small and medium level entrepreneurs for investments, more employment opportunities, facilities to improve the science knowledge among students and opportunities for environmental protections.

## 6.1 Major Events During 2016

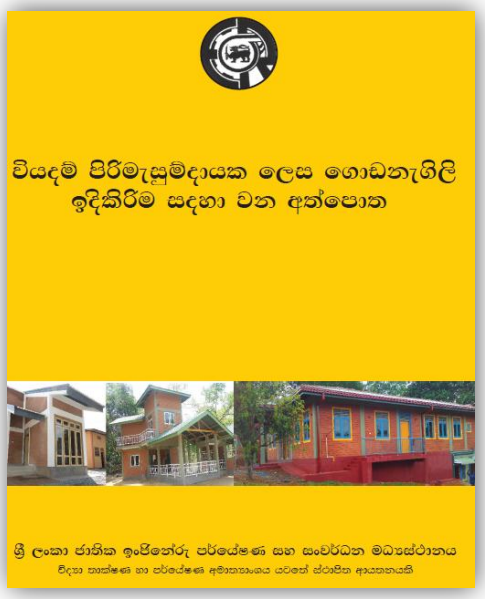
### 6.1.1 Introducing of Manufacturing of Cement Sand Roofing Sheet Technology

NERDC has developed roofing tile made with cement sand and pilot project was completed for 2500 sq.ft roof of building located at NERDC. With the band of corrugated asbestos roofing sheet, as an alternative, this cement sand roofing sheet can be used as roofing sheets. Stakeholder meeting was held on 10.05.2016, at NERDC' auditorium for key companies and other interested parties involved in manufacturing of roof tile and corrugated asbestos roofing sheets. More than 30 persons from tile industry had been participated.

### 6.1.2 Opening of the Renovated Building for Energy and Environmental Management Centre

Office building damaged by fire in EMC department has been renovated. The building had been constructed with special floor slab system using 2'x2'x4" pre cast brick panel resting on pre-stressed concrete beams. NERDC'S slab has not been subjected for damage caused by fire and close supervision has been carried out during the renovations. It has not been identified any damages to brick panel or to pre-stressed concrete beam due to fire.

### 6.1.3 Hand Book for Cost Effective Construction Technologies




It has been identified that unavailability of technical hand book on cost effective construction technologies is critical issue for the contractors, clients, consultant and house builders to use cost effective technologies for constructions. In order to fulfill this requirement, National Engineering Research and Development Centre prepared the Technical Hand Book on cost effective construction technologies for building construction including all standards and specifications of the technologies. It will be a great strength for the house builders who need to apply cost effective construction technologies for their constructions.

### 6.1.4 Pilot Project on Pre - stressed Retaining Wall

**Completed Pilot Project at Dalupitiya**

**RC Retaining Wall Failure at Kothmale**

Today, retaining walls are become essential for even in normal housing due to shortage of land. Present construction technologies used for the retaining walls are required large space and cost. In order to minimize these two issues NERDC has introduced pre stressed precast concrete panel for retaining walls which required less space and less cost. Pilot projects have been completed using new technology at Dalupitiya Clinical Building at Dalupitiya belongs to Mahara Pradesiya Sabawa. Height of the retaining wall is 8 feet and length 30 feet. Cost of the wall is Rs 250, 000.00 and it will save 15% of cost compare to cost of RCC retaining wall. Spaced required for pre stressed concrete panel retaining wall is 80% of the space required for Random rubble masonry retaining wall.

### 6.1.5 Opening Day Exhibition Technology Park

One day Engineering and Technology Exhibition was organized by National Engineering Research and Development Centre of Sri Lanka (NERDC) for the popularizing of NERDC developed technologies among the public. It was held on 19th of November 2016 at the technology park of the NERDC.

This exhibition was opened by participating of all former chairmen of NERDC for the event of planting trees at the premises of Technology Park. In the exhibition, several special activities were conducted to give the benefits of new technologies developed by the Centre for the general public such as displaying of machines and equipment, practical demonstrations, building clinic for solving of construction problems faced by the people, allow to visit engineering museum for public at free of charge and also conducted some other activities to enhance the knowledge and entertainments for the visitors.

### 6.1.6 ISO 17025 CERTIFICATION, Accreditation Status for Laboratory


SLAB
Certificate of Accreditation
Sri Lanka Accreditation Board for Conformity Assessment
hereby declares that
Environmental Laboratory
Energy & Environmental Management Centre
National Engineering Research and Development Centre
having being found to comply with the accreditation criteria for testing/calibration laboratories as described in ISO / IEC 17025 :2005, has been accredited as a testing laboratory under the field of
Chemical & Mechanical Testing
and has been assigned the accreditation number
TL 060-01
This certificate is issued on 14 September 2016 and is valid until
14 June 2019
The accreditation was granted for the first time for Chemical testing on 15 June 2016.
The scope and conditions of accreditation are specified in the Schedule of Accreditation bearing the accreditation number appearing in this certificate.
Deputy Director (Accreditation)
Sri Lanka Accreditation Board for Conformity Assessment
Colombo, Sri Lanka

**ISO 17025 Achievements**

In this year E&EMC has obtained ISO “17025 Accreditation” for “Waste Water Testing” and “Noise Level Measurements” in order to continual improvement of processes for the better services to the industries and clients.

### 6.1.7 NERDC Research Symposium 2016


Research Symposium -2016
National Engineering Research & Development Centre
Meeting Societal Needs Through Innovation
15th November 2016

The Research Symposium was held to coinside with the National Science week in 2016. Six tecnical papers on NERDC developed technolgies were pudring the symposium and best thee paper presentations were awarded.

## 6.2 Major Research and Development Activities during the Year 2016

### 6.2.1 Development of Machine to Remove Weeds Grown in Tanks of Breeding Freshwater Fish

The water bodies are filled with aquatic weeds and water capacity of the tanks are rapidly decreasing causing economical and health threats to people lived in suburb areas as well as to fishing industry. Presently, these weeds are removed by manually which will take more time and cost. Fisheries Department, Southern Province has been faced for this problem for long time and has requested to find the feasible mechanism to remove the aquatic weeds in tank. NERDC has commenced research on developing low cost, user friendly mechanical device to cut and remove weeds, which can be mounted on non- motorized boat (oruva). Presently fields trials are in progress.

### 6.2.2 Development of Machinery for Coconut Industry

Major issues faced by coconut planters are coconut de-husking and coconut harvesting processes due to un-availability of labour and high labour cost. In order to address these two issues, NERDC has commenced research projects to introduce implements for coconut de-husking and coconut harvesting. Presently developing of manually operated de husking device and industrial type de husking machine are in progress. Few field trials are completed and modifications are going on. The plucking pole is introduced for the coconut harvesting and field trials are going on.

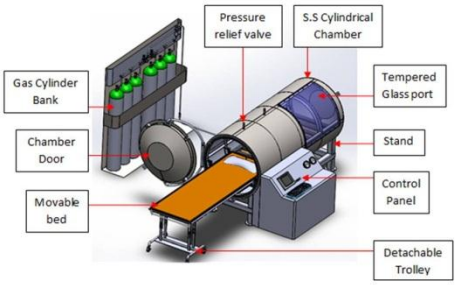
Manual Coconut De-husker

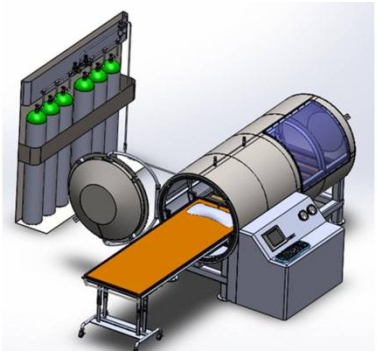
Industrial Coconut De-husker

### 6.2.3 Development of Smoked Fish Processing Unit

Presently available smoked fish are expensive, containing Polycyclic Aromatic Hydrocarbon (PAH) and quality of the products is not satisfactory. The NERDC initiated this project with NARA in order to improve the quality of smoked fish and to reduce the cost by improving productivity. Capacity of the unit is 25 kg and firewood can be used. Presently, one unit has been completed and another unit is progressing.

### 6.2.4 Fabrication of Hyperbaric Oxygen Chamber



Hyperbaric Oxygen Therapy has been identified as a well-accepted treatment for many patients, suffering from diabetics and related wounds in addition to acute and chronic damaged tissues. Unfortunately, this technology is not available in Sri Lanka even though it is widely used in other developed countries. Therefore, cost effective and user friendly HBOC (Hyperbaric Oxygen Chamber) has been designed for giving an effective treatment for all types wounds with acute and chronic damaged tissues. Fabrication processes are in progress.

### 6.2.5 Mechanization of Construction of Wall

Construction of wall is consumed major cost components of building construction processes causing high cost of labor and materials.

Slip-form wall technology for construction of wall is introduced by NERDC before more than 4 decade and technology is not popular up to expected level. Mechanization of construction of slip-form wall will reduce labor cost and will improve the quality of wall. Project was started to mechanize the slip form construction technology and presently research part is completed and need to start product development stage.

### 6.2.6 Further Development of Semi-Automatic Hopper Machine

In order to improve the productivity hopper making processes and quality of the hoppers, project has been started with university of Ruhuna. Presently, 90% of the project is completed and technology transfer processes is in progress. Output of the machine is 350 hoppers per hour and container capacity is 200 hoppers.

### 6.2.7 Re-Engineering of Milking Machine

Development of the machine has been completed and 10 number of machine has been given to farmers for field testing. Required modifications have been identified and modifications are to be completed. Wastage of the milking processes can be minimized and speed of the processes can be increased.

### 6.2.8 Development of Semi-automatic Medication Envelope Production Machine

Project has been started based on the demand from industry and 90% of the project has been completed. Expected output of the machine is 1000 Nos. of envelopes per hour and size of the envelope is 70 mm x 95 mm.

### 6.2.9 Universal Data Acquisition Module for Building Management System

The project was started to improve facilities for building management system and to automate industries.

Presently System has been developed and tested with a variable speed drive and motors to ensure the suitability for industrial applications. Arrangements for field testing for industrial application are in progress.

### 6.2.10 Development of "L" Shaped Pre-stressed Precast Concrete Steps

"L" shaped Prestressed Concrete Step

Outside View of the Staircase

In order to reduce cost and time of construction of conventional stair case in building construction processes, L shaped precast pre stressed concrete steps have been developed. Development of technology is completed and pilot project also completed. Features of the newly developed steps are Covering the rise, improvements of the appearance and improving the strength of the steps.

### 6.2.11 Development of Cost Effective Roof Framework

In order to reduce the cost of timber roof frame works this project was commenced. Main objective of the project is to develop rafters using 2"x 1"reepers instead of single rafters having large sections.

Project has been completed and identified for the roof having spanned less than 8 feet, this technology can be used.

### 6.2.12 Cement stabilized compressed soil block (CSCSB)

Wall made with CSSB blocks are economical while painting of wall is consumed considerable cost. In order to reduce the cost of painting, this project was commenced. Paints have been developed and field trials have been completed. Pilot project with new paints is in progress.

### 6.2.13 Smart Parking Monitoring System

Project is commenced to introduce smart parking system with efficient and more intelligent to create convenient environments focusing to heavy traffic jam at public building, commercial places and similar locations. Output this project is to provide facility to identify the vacant slots for customer before reaching to relevant place. Projects have been completed and field trials are in progress. Pilot projects have been planned with Dialog mobile company for their Vehicle Park and the MoU is to be signed.

## 6.3 Pilot Projects

Pilot projects have been completed based on the NERDC's developed products, machineries and technologies for the demonstration, further studies and popularization. Following pilots have been completed during the year 2016.

### 6.3.1 Construction of Footbridges

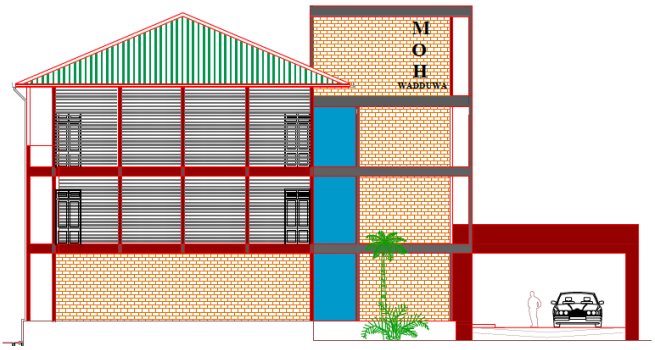
Two footbridges using Ferro-cement technology and the pre-stressed concrete technology have been completed in NERDC's Technology Park for the demonstration for the visitors.

### 6.3.2 Compact Wastewater Treatment Plant

A Compact Wastewater Treatment Plant for Vehicle Service Centre at Ekala was built for further testing. This wastewater treatment system required less space and low cost compared to the conventional wastewater treatment plant.

## 6.4. Consultancy Services for Buildings Construction

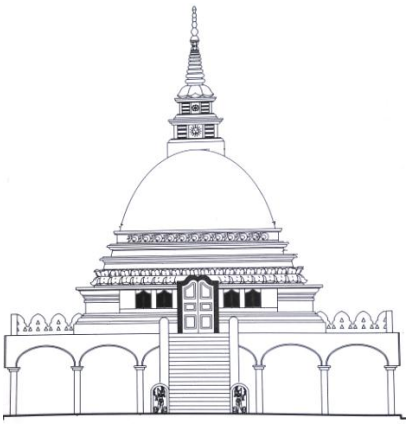
### 6.4.1 Construction of Medical Office Building – Wadduwa




Clients - Regional Director of Health Service Project is consisted with two numbers of three storied buildings having floor area are about 16500ft and 7200ft. Estimate cost of the project is Rs. 57 Million and consultancy charge is Rs. 2.8 M.

Presently, draft bidding documents have been completed.

### 6.4.2 Construction of Proposed Stupa, Wimala Maha Viharaya, Kotugoda



Dome type stupa is going to be built on RCC slab.

Value of the consultancy is Rs.113 000.00.

All structural and architectural drawings have been given to clients.

### 6.4.3 Consultancy Service for Construction of Two Number of Crematoriums at Hambanthota

Value of the consultancy Rs 400,000.00

75% of the project is completed.

## 6.5 Services for Areas of Precision Machining, Engineering Designing and Fabrications

These services have been conducted to provide the requirements of SME's involved in manufacturing industries and large scale manufacturing organization. Main services provided are;

- Design and manufacture intricate precision molds and dies
- Molds' modifications and design
- Conducting training program for SMESS
- Consultancy services for SMES
- Supportive services for the manufacturing industries

Income generations of above services are given in the Table 1.

**Table 1:** Information on Income generation

| Services | Value (Million) |
|---|---|
| Designing and manufacture1.41 | 1.41 |
| Manufacturing of components | 0.67 |
| Testing and scanning | 1.23 |
| Training program | 0.27 |

## 6.6 Services to Industries

### 6.6.1 Services to industries have been provided on the request of clients in the industries including following categories.

- Energy related services
- Caring out details energy audits
- Designing of efficient energy utilization system
- Industrial processes monitoring system
- Boiler analyzing and boiler tuning
- Designing of boiler tuning system
- Designing of boiler tuning system
- Designing of air conditioning system and commissioning
- ISO 50000 Consultancies
- Conducting awareness program on energy management and conservation
- Environmental related services
- Particulate matter and flue gas parameter monitoring of stationary combustion system
- Ambient air quality measurements
- Industrial emission and dust control system design
- Noise measurements and control system design
- Conducting awareness program on environmental management system
- Waste water testing and designing of waste water treatment plant

### 6.6.2 Value of the Services done to the Industries by Energy and Environmental Management System

**Table 2:** Value of the services

| Activity | Income Value (Rs. Million) |
|---|---|
| Environmental laboratory system | 1.34 |
| Providing solutions to environmental issues for industries | 0.71 |
| Environmental monitoring, services as per regulation | 4.62 |
| Boiler performance and Flue gas analysis | 5.71 |
| Industrial processes Monitoring and consultancy services | 1.23 |
| Training program | 0.18 |
| Conducting energy audits. | 0.28 |

## 6.7 Commercial Activities Completed based on the NERDC's Developed Technologies

### 6.7.1 Fabrication of Machineries for Ayurveda Sector

The NERDC had fabricated number of machineries for Ayurvedic medicine system such as crushing machines, juice extractors and handed over to Doctors' Societies in different areas of the country and value of the work completed are given below.

**Table 3: Fabrication of Machineries for Ayurveda Sector**

| Names of Machines | No. of Machines completed | Value (Rs.) |
|---|---|---|
| Jack Operated Oil Expeller | 10 | 645,000.00 |
| Fabrication of Crusher Machine | 07 | 408,000.00 |
| Fabrication of Manioc Slicer | 01 | 30,000.00 |

### 6.7.2 Development and Fabrication of Handloom Fabric Inspection Machine for Handloom Industries

Request was done from Department of Industries, Western Province to fabricate a machine for inspection of quality of handloom made by the people in some areas.

The NERDC has developed the machine and cost of the machine was Rs. 798,000/=. The job has been completed and handed over to the Department of Industries, Western Province.

## 6.8 Laboratory Testing

### 6.8.1 Laboratory Testing have been carried out in the field of Civil Engineering and following test have been performed.

**Table 4:** Laboratory testing

| Names of Tests | Number of Tests Completed | Income (Rs) |
|---|---|---|
| Compressive Strength of Concrete Cube | 468 | 245,700 |
| Compressive Strength of Cement Blocks | 60 | 31,500 |
| Compressive Strength of Soil Blocks | 42 | 22,050 |
| Compressive Strength of Paving Blocks | 350 | 183,750 |
| Tensile Strength of Steel | 42 | 50,400 |

### 6.8.2 Values of Tests completed by the Electronics and Electrical Laboratory

**Table 5:** Values of the tests

| Names of Tests | No. of Tests Completed | Value (Rs. Million) |
|---|---|---|
| Lamp testing | 225 | 1.3 |
| Battery testing | 06 | 0.15 |
| Calibration services | 23 | 0.15 |

## 6.9 Training Programms and Awareness Programms

### 6.9.1 Training Programme on NERDC Developed Technologies

Providing of training for popularization of technologies developed by the Centre, for upgrading of the knowledge of the people involved in industries are the main objectives of our training programs. In order to fulfill these requirements, training programs have been conducted in flowing Subjects.

**Table 6: Training programmes on NERDC Developed Technologies**

| Name of the Training Programmes | Number of Programmes Conducted | Number of Participants | Income (Rs.) |
|---|---|---|---|
| Manufacturing of Cement stabilized compressed soil block | 06 | 85 | 322,000 |
| Cost effective construction technology for building construction | 04 | 75 | 44,000 |
| Manufacturing of precast concrete building components | 04 | 200 | 100,000 |
| To create self-employments opportunities based on the NERDC developed technologies | 04 | 210 | 100,000 |
| Out bound training programs have been conducted for ,students, teachers, with collaboration of Sustainable Energy Authority and the Inventors Commission | 04 | 146 | 100,000 |
| Special program for improving science knowledge of science teachers with the collaboration of Department of educations | 08 | 343 | 44,000 |

### 6.9.2 Training Program for Upgrading of Knowledge of People involved in Industries

Numbers of training programs have been conducted to improve the knowledge of people after identifying the training need of the industry.

| Names of Programmes | Number of Programmes Conducted | Number of Participants | Income (Rs ) |
|---|---|---|---|
| Basic Understanding of Building Structure | 01 | 31 | 102,415.00 |
| Entrepreneurship Development | 01 | 21 | 27,810.00 |
| Construction, Operation, and Maintenance of Biogas Digesters | 01 | 13 | 71,500.00 |
| Industrial Pumps Theoretical and Practical Aspects | 01 | 23 | 158,000.00 |

| Names of Programmes | Number of Programmes Conducted | Number of Participants | Income (Rs ) |
|---|---|---|---|
| Crematorium Operation and Maintenance | 01 | 60 | 170,000.00 |
| Finite Element Modeling / Analysis and Design" | 01 | 08 | 48,000.00 |
| Chemical Safety and Safe Storage of Hazardous Chemical | 01 | 53 | 189,000.00 |
| Programmable Logic Controller Programming | 11 | 140 | 709,322.00 |
| Industrial Instrumentation and Control System | 02 | 30 | 135,000.00 |
| Pneumatic Usage for Industrial Applications | 04 | 50 | 250,000.00 |
| Forklift Maintenance | 02 | 43 | 225,000.00 |
| Motor Vehicle Awareness Programme | 01 | 05 | 30,000.00 |

## 6.10 Popularization Activities

One major task for the NERDC is to popularize our products and technologies and still center was unable to achieve sufficient progress in term of popularization of developed product and technologies. Paper articles, publishing research papers, Conducting TV and radio program and participating of exhibitions are arranged throughout year to improve our popularization processes. In 2016, numbers of activities have been carried out and more information is indicated.

- Participated for 11 numbers of exhibitions including national level exhibition such as Techno exhibition, build Sri Lanka exhibition and SRI Lanka New-A Blue Green Era Exhibition at BMICH.
- 15 number of paper article have been published in national level newspapers including Dinamina and Tharuni Newspapers.
- Four TV program have been conducted through Rupavahini and ITN TV channel.
- Open day exhibition had been conducted at the NERDC Technology Park and general public are allowed to enter for exhibition without any payments. More than 2000 people were participated. More services have been provided at the exhibition such as building clinic and energy clinic to solve issues related to housing energy sector of the people at free of cost.

## 6.11 Technology Transfer Activities

During the year 2016, NERDC were able to transfer technologies developed by NERDC to entrepreneurs, and applied patent for new developed technologies by the Centre.

### 6.11.1 Details of Technology Transfers

| Developed Technologies | Number of Licensees |
|---|---|
| Cost Effective building technology | 11 |
| Manufacturing of cement stabilized compressed cement stabilized soil blocks (CCSB) | 02 |
| CCSB Making machine (manual) | 01 |
| Construction of Ferro cement foot bridge | 01 |
| Construction of Pre-stressed concrete foot-bridge | 01 |
| Manufacturing of pre-stressed concrete beam for footbridge | 01 |

### 6.11.2 License Renewal

License renewal for all licensees is required in order to continue their industry as NERDC's licensees for the next year. Details for the year 2016 are given below.

| Names of Technologies | No. of Registered Licensees |
|---|---|
| Cost effective construction technologies for building construction | 32 |
| Manufacturing of CCSB for wall construction | 01 |
| Making machine for manufacturing of CCSB | 04 |
| Vegetable Drier | 01 |
| Pre stressed concrete yards | 05 |
| Construction of crematorium | 06 |
| Construction of biogas plants | 06 |
| Biogas Rice Cooker | 01 |
| Cashew Drier | 01 |
| Solar heater | 02 |

### 6.11.3 Patents Applied

During 2016, Patent applications have been filed for new developed technologies.

| Patent No. | Patents | Dates of Files |
|---|---|---|
| 18639 | Flap gate with water flow indicator to prevent salt water intrusion through canal | 11.02.2016 |
| 18792 | Motorized Manioc slicer | 16.05.2016 |
| 18904 | Compact waste water treatment system for service station | 28.07.2016 |
| 18967 | Power weeder for row planted paddy cultivation | 07.09.2016 |
| 19102 | Device for measuring surface moisture in fresh tea leaves | 30.11.2016 |

# 07. Welfare and Religious Activities

In order to enhance the interpersonal relationship, cooperation, teamwork of the staff and staff commitment to the institutional common activities, the NERDC has given special consideration for employee welfare and religious functions. Accordingly, summary of the activities executed by the welfare society and the religious societies in 2016 are as follows;

## 7.1 Welfare Society

Following activities have been undertaken by the welfare society of the NERDC during the year 2016

- Blood Donation Campaign in commemoration of the late Vidyajyothi Dr. A N S Kulasinghe, former Chairman of the NERDC was held on 28th October 2016.
- Ceremony was organized on 19h November 2016 to appreciate the Children of NERDC Staff who had passed Grade 5 Scholarship Examination in 2016
- Organized a Get-together for all Employees and their family members at Kulasinghe Auditorium at NERDC on 29th December 2016.

## 7.2 Religious Society

Two religious societies have being actively operated in the NERDC, namely Buddhist society and Catholic society. These societies organize various religious and Corporate Social Responsibility (CSR) programmes and activities in order to enhance the spiritual wellbeing of the NERDC staff members. One prominent feature of these societies is that all employees of the staff are a member of either the Buddhist society or the Catholic society voluntarily.

Following religious activities have been organized by these societies in the year 2016.

### 7.2.1 Buddhist society

- In order to mark commencement of Centre activities of the year 2016, a pirith chanting ceremony was conducted on 02.01.2016.
- Conducted an Ugasana Kawyamaya Dharmadeshana programme on 29.01.2016.
- Conducted a Poson Dharmadeshana (sermon) by Shasthrapathi Poojya Kimbulapitiya Wimalananda Thero.
- An alms giving programme was held for the children in Jayawardena children's, Home, Ja Ela on 25.10.2016.

### 7.2.2 Catholic Society

- Arranged a pilgrimage to Madu church from 24 & 25 September 2016.
- Conducted the annual Christmas Mass on 20.12.2016 at the NERDC

# 08. Statment of Financial Position as at 31.12.2016

**Statement of Financial Position As At 31.12.2016**

Figures in Rs.

| | 2016 | Restated 2015 |
|---|---|---|
| **Assets** | | |
| **Current Assets** | | |
| Cash & Cash Equivalent | 95,484,593.69 | 105,890,568.07 |
| Trade Receivables | 27,969,438.62 | 14,788,493.00 |
| Inventories | 8,195,538.40 | 8,380,528.01 |
| Pre - Payments | 701,155.98 | 615,504.27 |
| Other Current Assets | 46,912,749.13 | 63,154,210.32 |
| | 179,263,475.82 | 192,829,303.67 |
| **Non-Current Assets** | | |
| Property Plant & Equipment | 580,620,198.75 | 604,186,443.92 |
| Other Intangible Assets | 312,420.45 | 247,480.45 |
| Other non-current Assets | 25,651,942.83 | 25,041,481.58 |
| | 606,584,562.03 | 629,475,405.95 |
| **Total Assets** | 785,848,037.85 | 822,304,709.62 |
| **Liabilities** | | |
| **Current Liabilities** | | |
| Trade & Other Payables | 33,877,432.09 | 43,496,287.61 |
| Total Current Liabilities | 33,877,432.09 | 43,496,287.61 |
| **Non Current Liabilities** | | |
| Provision for Gratuity | 98,094,019.75 | 96,421,087.25 |
| Security Deposit | 6,200.00 | 7,200.00 |
| | 98,100,219.75 | 96,428,287.25 |
| **Total Liabilities** | 131,977,651.84 | 139,924,574.86 |
| **Total Net Assets** | 653,870,386.01 | 682,380,134.76 |
| **Net Assets/Equity** | | |
| Defferd Income | 103,962,903.00 | 120,285,393.23 |
| Capital contributed by the government entities | 250,560,299.26 | 257,002,660.64 |
| Revaluation Reserve | 535,275,831.83 | 535,275,831.83 |
| Accumulated surpluses/(deficits) | (235,928,648.08) | (230,183,750.94) |
| **Total Net assets/Equity** | 653,870,386.01 | 682,380,134.76 |

| Eng. W J L S Fernando | Eng.D.D.Ananda Namal | D.V.S. Perera |
|---|---|---|
| Chairman | Director General | Director Finance |

## 09. Statment of Financial Performance for the year ended 31.12.2016

**Statement of Financial Performances for the Year Ended 31.12.2016**

Figures in Rs.

| | 2016 | Restated 2015 |
|---|---|---|
| **Revenue** | | |
| Transfers from the government entities | 231,025,150.00 | 209,954,373.00 |
| Defferd Income | 53,879,815.61 | 39,230,133.16 |
| Other Income | 27,311,316.95 | 29,968,832.81 |
| Total Revenue | 312,216,282.56 | 279,153,338.97 |
| **Expenditure** | | |
| Administrative Cost | 237,527,385.28 | 231,142,402.86 |
| Other Expenses | 20,738,992.04 | 10,314,061.28 |
| Depreciation | 59,600,362.75 | 39,889,214.21 |
| Financial Cost | 94,439.63 | 46,315.71 |
| **Total Expenditure** | 317,961,179.70 | 281,391,994.06 |
| **Surplus/( Deficit) for the period** | (5,744,897.14) | (2,238,655.09) |

# 10. Cash Flow Statement for the year ended 21.12.2016

**Cash Flow Statement For The Year Ended 31st December 2016**

Figures in Rs.

| | 2016 | Restated 2015 |
|---|---|---|
| **Net Cash flows from operating activities** | | |
| **Surplus/ (deficit) from ordinary activities** | (5,744,897.14) | (2,238,655.09) |
| | | |
| **Non- Cash movements** | | |
| Depreciation | 59,600,362.75 | 39,889,214.21 |
| | | |
| Increase in provision for bad debts | (1,042,716.03) | (52,387.81) |
| Increase /(decrease) in differed Income | (53,879,815.61) | (39,230,133.16) |
| Increase/(decrease) in payables | (7,913,454.27) | 8,482,434.22 |
| Increase/(decrease) in relating to employee costs | (33,468.75) | 19,143,127.50 |
| (Gains)/losses on sale of property, plant and equipment | 1,523,208.79 | 10,205.65 |
| (Increase)/decrease in other current assets | 15,730,337.84 | (11,635,745.80) |
| (Increase)/decrease in receivables | (12,138,229.59) | (6,232,386.55) |
| **Net Cash Flows from operating activities** | (3,898,672.01) | 8,135,673.17 |
| | | |
| **Cash Flow From Investment Activities** | | |
| Purchase of Assets | (37,622,266.37) | (27,798,491.11) |
| Proceeds from sales of equipment | - | 2,207.20 |
| | | |
| **Net Cash Flows from Investment Activities** | (37,622,266.37) | (27,796,283.91) |
| | | |
| **Cash Flow From Financing Activities** | | |
| Capital grant | 31,114,964.00 | 31,798,897.00 |
| **Net Cash Flow from Financing Activities** | 31,114,964.00 | 31,798,897.00 |
| **Net Increase/(Decrease) in Cash & Cash equivalents** | (10,405,974.38) | 12,138,286.26 |
| **Cash & Cash Equivalent at beginning of the period** | 105,890,568.07 | 93,752,281.81 |
| | | |
| **Cash & Cash Equivalent at end of the period** | 95,484,593.69 | 105,890,568.07 |

**01.** **Statement of Change in Equity As At 31.12.2016** Figures in Rs.

| | Capital Introduced | Contributed Capital | Non Cash Grants from Treasury | Deffered Income | Capital from Other sources | Re stated Revaluation surplus | Accumulated Surplus /(Deficit) | Total Net Assets/Equity | Balance As At 31.12.2015 |
|---|---|---|---|---|---|---|---|---|---|
| Balance as at 01/01/2015 | 1,000,000.00 | 61,378,800.39 | 43,350,000.00 | 122,461,854.77 | 119,985,089.87 | 354,564,874.91 | (227,945,095.85) | 474,795,524.09 | 494,180,401.66 |
| **Changes in equity for 2015** | | | | | | | | - | |
| Capital Grant received | | 31,798,897.00 | | | | | | 31,798,897.00 | 43,026,477.00 |
| Vehicle grant | | | 7,975,000.00 | | | | | 7,975,000.00 | 9,500,000.00 |
| Net of Capital purchase less recoverable depreciation to Defferd Income | | (37,053,671.62) | | (2,176,461.54) | | | | (39,230,133.16) | (53,806,701.25) |
| Capital Reserved From other Sources | | | | | 28,568,545.00 | | | 28,568,545.00 | |
| Surplus/Deficit for the period | | | | | | | (2,238,655.09) | (2,238,655.09) | (17,016,180.49) |
| Increase in revaluation reserve | | | | | | 180,710,956.92 | | 180,710,956.92 | (1,088,472.83) |
| Balance as at 31/12/2015 | 1,000,000.00 | 56,124,025.77 | 51,325,000.00 | 120,285,393.23 | 148,553,634.87 | 535,275,831.83 | (230,183,750.94) | 682,380,134.76 | 474,795,524.09 |
| **Changes in equity for 2016** | | | | | | | | | |
| Capital Grant received | | 31,114,964.00 | | | | | | 31,114,964.00 | 31,798,897.00 |
| Vehicle grant | | | - | | | | | - | 7,975,000.00 |
| Net of Capital purchase less recoverable depreciation to Defferd Income | | (37,557,325.38) | | (16,322,490.23) | | | | (53,879,815.61) | (39,230,133.16) |
| Capital Reserved From other Sources | | | | | - | | | - | 28,568,545.00 |
| Surplus/Deficit for the period | | | | | | | (5,744,897.14) | (5,744,897.14) | (2,238,655.09) |
| Increase in revaluation reserve | | | | | | - | | - | 180,710,956.92 |
| Balance as at December, 2016 | **1,000,000.00** | **49,681,664.39** | **51,325,000.00** | **103,962,903.00** | **148,553,634.87** | **535,275,831.83** | **(235,928,648.08)** | **653,870,386.01** | **682,380,134.76** |

# 12. Accounting Policies

**1 . General Information**

National Engineering Research and Development Centre of Sri Lanka (NERDC) was established in accordance with the provision of State Industrial Corporation Act No 49 of 1957 and during year 2016 it was functioning under the purview of the Ministry of Science Technology and Research. And is located at 2P/17B, Industrial Estate, Ekala, Ja-ela.

**Principal Objectives**

- To provide for an institutional mechanism needed for the progressive development of indigenous technology by encouraging, recognizing and developing innovative and creative talent in Sri Lanka.
- To provide facilities to co-ordinate the technological, engineering and research capabilities of various public and private sector industries and institutions in a productive manner through co-operative endeavor.
- To ensure by adoption and adaptation the choice of technologies that would be consistent with the country's resource endowments and national planning objectives.
- To examine direct and indirect mechanism of technology transfer and offer counsel to appropriate government and private institutions in Sri Lanka, when required to do so.
- To promote the optimal exploitation of the country's human and material resources, particularly labor and raw material resources by promoting the growth of suitable technology.
- To design, manufacture, and test prototype machinery, pilot plants as demanded by Industrial, commercial and other end users in an economical manner.
- To provide for continuous monitoring of technological data and documentation relating to engineering designs and research through the co-operation of international and national agencies.
- To offer sustained consultancy services to public and private sector enterprise and undertake research and promote training activities to broaden the base of the country's engineering and industrial design and research capabilities.
- To make provision for purpose connected with engineering, research and development related to matters aforesaid.

**2. Basis of Preparation**

Financial Statements, which comprise the Statement of Financial Position, Statement of performances, Changes in Equity and Cash Flows together with Accounting Policies and Notes to the Financial Statements, have been prepared in accordance with Sri Lanka Public Sector Accounting Standards.

Current accounting period is from 1st January 2016 to 31 st December 2016

These financial statements are for year ended 31 December 2016.

**2.2 Basis of Measurement**

The Financial Statements of the Centre, which comprise the Statement of Financial Position, Statement of performances, Changes in Equity and Cash Flows have been prepared on the basis that the Centre is going concerns and on a historical cost basis

**2.3 Functional and Presentation of Currency**

Items included in the financial statements of Centre are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). Financial statements are presented in Sri Lankan Rupees, which is the Centre functional and presentation currency unless stated otherwise.

**2.4 Comparative Information**

The Financial Statements for the comparative periods comprise results for the twelve months period from 1 January 2015 to 31 December 2015. In this circumstance, the comparative information for the Statement of Financial Position, Statement of Performances, Statement of Changes in Equity and Cash Flow Statement and related notes are comparable with the current period.

**2.5 Significant Accounting Judgments, Estimates and Assumptions**

The preparation of Financial Statements in conformity with Sri Lanka Public Sector Accounting Standards requires Management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income, expenses and the disclosure of contingent liabilities. However, uncertainty about these assumptions and estimates could results in outcomes that require material adjustment to the carrying amounts of the assets or liabilities affected in future periods. The Centre's Management has made an assessment of its ability to continue as a going concern and is satisfied that it has the resources to continue in business for the forseable future. Furthermore, Management is not aware of any material uncertainties that may cast significant doubt upon the Centre's ability to continue as a going concern. Therefore, the financial statements continue to be prepared on the going concern basis.

**3.0 Property, Plant and Equipment**

**3. 1 Recognition and Measurement**

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located and capitalised borrowing costs. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment. When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment. The gain or loss on disposal of an item of property, plant and equipment is determined by comparing the proceeds from disposal with the carrying amount of the property, plant and equipment, and is recognised net value within other income/other expenses in performance statement. When revalued assets are sold, any related amount included in the revaluation reserve is transferred to retained earnings.

### 3.2 Revaluation

The items within a class of property, plant and equipment are revalued simultaneously in order to avoid selective revaluation of assets and the reporting of amounts in the financial statements that are a mixture of costs and values as at different dates. However, a class of assets is revalued on a rolling basis provided revaluation of the class of assets is completed within a short period and provided the revaluations are kept up to date.

The fair value of items of property is usually determined from market-based evidence by appraisal. The fair value of items of plant and equipment is also usually their market value determined by appraisal. An appraisal of the value of an asset is normally undertaken by a member of the valuation profession, who holds a recognized and relevant professional qualifications. For many assets, the fair value will be readily ascertainable by reference to quoted prices in an active and liquid market.

If the carrying amount of a class of assets is increased as a result of a revaluation, the increase shall be credited directly to revaluation surplus. However, the increase shall be recognized in surplus or deficit to the extent that it reverses a revaluation decrease of the same class of assets previously recognized in surplus or deficit.

If the carrying amount of a class of assets is decreased as a result of a revaluation, the decrease shall be recognized in surplus or deficit. However, the decrease shall be debited directly to revaluation surplus to the extent of any credit balance existing in the revaluation surplus in respect of that class of assets.

Revaluation increases and decreases relating to individual assets within a class of property, plant and equipment has been offset against one another within that class but must not be offset in respect of assets in different classes.

### 3.3 Depreciation

Depreciation is based on the cost of an asset less its residual value. Significant components of individual assets are assessed and if a component has a useful life that is different from the remainder of that asset, that component is depreciated separately. Depreciation is recognised in profit or loss on a straight-line basis over the estimated useful lives of each component of an item of property, plant and equipment. The estimated rates of the current and comparative years are as follows :

| Asset Category | Depreciation % |
|---|---|
| Building | 2.5 |
| Office Equipment | 15 |
| Tools | 15 |
| Demonstration items | 15 |
| Computers | 33 1/3 |
| Vehicle | 15 |
| Furniture & Fittings | 10 |
| Plant Machinery & Lab Equipment | 15 |
| Library Books | 5 |
| Infrastructure | 15 |
| Soft ware | 33 1/3 |

**3.4 De-Recognition**

The carrying amount of an item of property, plant and equipment is de-recognised on disposal of or when no future economic benefits are expected from its use or disposal. Gains and losses on de-recognition of the asset are determined by comparing the proceeds from disposal with the carrying amount of property, plant & equipment and are recognised net within 'other income' in the performance statement as Other income.

**3.5 Intangible Assets**

Intangible assets that are acquired by the Centre and have finite useful lives are measured at cost less accumulated amortisation and accumulated impairment losses. Subsequent expenditure is capitalized only when it increases the future economic benefits embodied in the specific asset to which it relates. Amortisation is based on the cost of an asset less its residual value. Amortisation is recognised in performance statement on a straight-line basis over the estimated rates of intangible assets, from the date that they are available for use. The estimated rates and comparative years are as follows:

• Software 33 1/3 years Amortisation methods, useful life and residual values are reviewed at end of each year.

**4. Inventories**

Inventories are measured at the lower of cost and net realisable value. The cost of inventories is based on the first-in-first-out (FIFO) principle, and includes expenditure incurred in acquiring the inventories and other costs incurred in bringing them to their existing location and condition. Chemical stocks and the Work in progress of projects are valued at the cost .

**5. Trade Receivables**

Trade receivables of the Centre are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method, less provision for impairment.

**6. Cash and cash Equivalents**

In the statement of cash flows of the Centre, cash and cash equivalents includes cash in hand, cash at bank ,Temporary call deposits & state Institutional surplus fund deposits.

**7. Loans and receivables**

Financial assets with fixed or determinable payments that are not quoted in an active market, such assets are recognised initially at fair value plus any directly attributable transaction costs. Subsequent to initial recognition Loans and receivables comprise cash and cash equivalents, trade receivables and amounts due from related parties.

**8. Financial Liabilities**

The Centre classifies non-derivative financial liabilities into the other financial liabilities category. Other financial liabilities comprise trade payables and related party payables. Such financial liabilities are recognised initially at fair value plus any directly attributable transaction costs. The statement of financial position when, and only when, the Centre has a legal right to offset the amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

**9. Employee Benefits**

Retirement benefits to employees are provided according to the laid down statutory requirements. Centre contribution for provident fund and employees' Trust Fund is 15% and 3% respectively. Gratuity provision is made according to the Gratuity Act No.12 of 1983. Provision is done for the employees from year one of service in the Centre. The funds required for payment of gratuity is given by Treasury when requires. Provision is calculated as follows

(Last drawn Basic Salary plus cost of living & other allowances) x ½ x Completed Number of Years.

**10. Provisions**

A provision is recognised if, as a result of a past event, the Centre has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation.

**11. Provisions, contingent assets and contingent liabilities**

Provisions are made for all obligations existing as at the Balance Sheet date when it is probable that such an obligation will result in an outflow of resources and a reliable estimate can be made of the quantum of the outflow. All contingent liabilities are disclosed as a note to the financial statements.

**12. Revenue**

Revenue is recognized to the extent that it is probable that the economic benefits will flow to the Centre, and the revenue and associated costs incurred or to be incurred can be reliably measured. Revenue is measured at the fair value of the consideration received or receivable, net of trade discounts, NBT and value added taxes. The following specific criteria are used for recognition of revenue:

**a) Sale of Developed Products**

Revenue from the sale of developed products, is recognized when the significant risk and rewards of ownership of the products have passed to the buyer with the Centre retaining neither a continuing managerial involvement to the degree usually associated with ownership, nor an effective control over the products are sold.

**b) Rendering of Services**

Revenue from rendering of services is recognized in the accounting period in which the services are rendered or performed.

c) **Construction Revenue**

Construction revenue is recognized by reference to the stage of completion where the contract outcome cannot be measured reliably and revenue is certain.

**d) Taxes**

Taxes include Value Added , Nation Building Tax. Centre Companies in the Centre pay such taxes in accordance with the respective statutes.

**e) Interest Income**

Interest income is recognized as and when the interest accrues.

**f) Gains and Losses on Disposal of Assets**

Net gains and losses of a revenue nature arising from the disposal of property, plant and equipment and other non-current assets, are accounted for in the Income Statement, after deducting from the proceeds on disposal, the carrying amount of such assets and the related selling expenses. Gains and losses ,arising from activities incidental to the main revenue, generating activities and those arising from a Centre of similar transactions which are not material, are aggregated, reported and presented on a net basis.

**g) Other Income**

Other income is comprised with net income of Technology transfer projects which are completed, Interest income on call deposits, Liquidity damages, Bond income, Interest on loans, Nonrefundable deposits, Registration of Suppliers, Sundry income, Damaged Stock disposal income, Gain on disposal of assets and overhead recovery etc.

**h) Differed Income**

Where the Capital grant relates to an asset released from the general treasury, when the recurrent grant relates to an expense item, it is recognized as income over the period necessary to match the grant on a systematic basis to the costs that it is intended to compensate.

**12. Grants**

Grants are recognized when there is reasonable assurance that the grant will be received and all attaching conditions will be complied with. When the recurrent grant relates to an expense item, it is recognized as income over the period necessary to match the grant on a systematic basis to the costs that it is intended to compensate. Where the Centre receives non-monetary grants, the asset and that grant are recorded at fair value.

**13. Expenditure and Presentation in Income Statements**

Expenses are recognized in the income statement on the basis of a direct association between the cost incurred and the earning of the specific items of income where appropriate. All expenditure incurred in running of the Centre and depreciation of the property, plant & equipment has been charged to income in calculating the surplus/ (deficit) for the period.

**14. Research & Development**

Research & Development projects are mainly funded by the Treasury. If Research projects are partly funded by a client this income is taken against the expenditure.When costing the research projects direct cost considered.

**15. Awards to Winning Research Engineers**

The Members of BoDs. approved to reimburse some of the funds received through awards to the NERDC, among the applicable Research Engineers, as per the following .

a) Reimbursement of 60% of the award money among the Researchers involved in award winning Research Projects. Researchers would be identified as those, who were responsible for the submission of the applications for the awards.

b) Allocated amount is distributed among the team members proportional to the salary as at the date of application closing date.

c) This will apply to past awards and future awards.

d) For the past awards, reimbursement will be done only to the Researchers, who are at service of NERDC at present (but for calculation, all the team members will be considered.)

e) The amount identified for Researchers, who are not presently not employed would be retained along with the 40% of the award money for future activities of NERDC in promoting the research culture.

# 13. Notes to the Accounts

## 1. Previous Year Adjustments

| Ref | Description | Effect to the Performance | | Effect to the Financial Position |
|---|---|---|---|---|
| | | 2015 | Before 2015 | |
| 1.1 | RED/COM/2/95/14<br><br>Over provision in after sales services in 2014<br>As At 31/12/2014 After the adjustment<br>Income 537,200.00 537,200.00<br>Expenditure 437,775.06 432,775.06<br>Net Profit 99,424.94 104,424.94 | | 5000.00 | Reduction in liabilities. |
| 1.2 | CIVIL/COM/86/11<br><br>Retention money due to Pollonnaruwa Construction was withheld due to not completing the defects notified. | | 300,755.00 | Reduction in liabilities. |
| 1.3 | Over provision in incentive 2015 | 438,698.98 | | Reduction in liabilities |
| 1.4 | CIVIL/COM/86/11<br><br>Estimated work done was revised due to change in the rates by Cabinet appointed rate committee | | (1,912,770.73) | Reduction in Debtors |
| 1.5 | DFCI/COM/119/14 reduction in overprovided Expenditure<br>Labour 25,872.00<br>Overheads 9,055.20<br>Machine in cost 49,780.00 | | (84,707.20) | Reduction in Work in Progress |
| 1.6 | Adjustments in depreciation provision due to classification error.<br><br>Building under provision of Rs.1,656,030.81<br>Building Other sources under provision of Rs.3.611.40<br>Infrastructure-Under provision Rs.1,815,988.67<br>Library books under provision Rs.1,187,281.78 | | (1,656,030.81)<br>(3,611.40)<br>(1,815,988.67)<br>(1,187,281.78) | Increase in accumulated depreciation |
| 1.7 | CIVIL/COM/103/15Under provision in the income Rs.8,521.74<br><br>As At 31/12/2014 After the adjustment<br>Income 167,747.75 176,269.49<br>Expenditure 114,500.00 114,500.00<br>Net Profit 53,247.75 61,769.49 | 8,521.74 | | Increase in Debtors |

| | | | | |
|---|---|---|---|---|
| 1.8 | In the year 2015 funds received as Capacity building amounted to Rs.3,918,417.00 is adjusted as a Income in the performance in year 2015 | 3,918,417.00 | | Increase in Net Assets |
| 1.9 | APH/COM/3/79/14<br><br>Over provision in expenditure as at 31/12/2015<br><br>As At 31/12/2014 After the adjustment<br>Income 3,505,829.50 3,505,829.50<br>Expenditure 2,706,830.96 2,692,406.55<br>Net Profit 798,988.54 813,422.73 | | 14,424.41 | Increase in Net Assets |
| 1.20 | In year 2015 Stock items value of Rs.4, 820.73 has been treated as Non – moving stocks. | 4,820.73 | | Stocks are increased |
| 1.21 | Returne items transferred to stationary account | 15.00 | 106.00 | Increase in Net Assets |
| 1.22 | RED/COM/106/2013<br><br>Value of work done is Overstatement | | (34,050.00) | Decrease in Working Progress |
| 1.23 | ELE/COM/6/55/2014<br><br>Income has been overstated | | (167,800.00) | Increase in Customer Advance. |
| 1.24 | RED/121/14<br><br>Value of work done in year 2015 is understated. | 314.558.56 | | Value of work done is increased |

**2. Deposits kept as securities for Guarantee Bonds**

| Guarantee is issued to | Bond No/Date | Certificates Pledge as securities | Amount Rs | Bank | Amount Rs |
|---|---|---|---|---|---|
| Toyota Lanka (Pvt) Ltd | Bank Guarantee-15/2008-18/12/2014 | C/33734579-507908 | 100,000.00 | Boc-Ja-ela | 75,000.00 |

**3. Temporary deposits**

Funds received as bond Income from NERDC employees who has left the services before completion of the bond is invested in State Institutions Temporary Surplus Trust Fund maintained at Bank of Ceylon on 30 the July 2012 Rs.8,994,089.90 and with dividends & interest it has increase to Rs. 11,467,716.93

Advances received from the customers are secured in the form of temporary call deposits with the bank, until such time it is used for the purpose. Interest earned is shown under other income.

**4. Loss written off due to the fire incurred at the in EMC Building**

E& EMC Building was caught fire on 5/4/2016 due to the electrical shortage in an Air-conditioner.

Following steps were taken

- Complain was pledged at Police station Ja-ela -Annexure 1
- Director General has appointed two committees
- To do a complete investigation of the incident, Committee report-annexure 2
- 2.2.2 To assess the loss incurred. Assessment Report-Annexure 3

Losses incurred

| **Cost of Assets** | Rs. |
|---|---|
| Damage to Electrical Installation | 351,830.00 |
| Damage to EMC building | 1,051,650.00 |
| Electrical appliances | 165,416.67 |
| Instruments &Equipment | 151,000.00 |
| Furniture & Fittings | 95,665.00 |
| Computers & Accessories | 10,000.00 |
| | 1,825,561.67 |
| Less - Accumulated Depreciation | (302,352.88) |
| | 1,523208.79 |
| **Loss on Consumable item** | |
| Glass ware Items | 8,182.78 |

## Assets to be written off from the Fixed Asset Register

| Asset Code | Description | Category | Dept. | Date | Rate | Cost | Depreciation for the 2016 | Cumulative Depreciation a up to disposal | Profit/(Loss) |
|---|---|---|---|---|---|---|---|---|---|
| FA0005203 | Emc Building (Revaluation 31/12/2007) | BU | EMC | 04/05/16 | 3 | 1,386,380.00 | 9,020.97 | 286,581.84 | (1,099,798.16) |
| FA0002175 | IR Colour SD Camera,HD Camera,8Channel Dual (Cctv) | OE | COM | 04/05/16 | 15 | 17,100.00 | 667.60 | 667.60 | (16,432.40) |
| FA0002484 | 21 Colour T V No 1- 25333.33" | OE | EMC | 04/05/16 | 15 | 27,000.00 | 1,054.11 | 1,054.11 | (25,945.89) |
| FA0002400 | Vacuum Cleaner A - 2004 (Wet/Dry) | OE | EMC | 04/05/16 | 15 | 11,000.00 | 429.45 | 429.45 | (10,570.55) |
| FA0002142 | Air Conditioner Split Type 36000 | OE | EMC | 04/05/16 | 15 | 112,416.67 | 4,388.87 | 4,388.87 | (108,027.80) |
| FA0002272 | Wall Fan 16 Kdk" | OE | EMC | 04/05/16 | 15 | 5,000.00 | 195.21 | 195.21 | (4,804.79) |
| FA0002273 | Wall Fan 16 Kdk" | OE | EMC | 04/05/16 | 15 | 5,000.00 | 195.21 | 195.21 | (4,804.79) |
| FA0002274 | Wall Fan 16 Kdk" | OE | EMC | 04/05/16 | 15 | 5,000.00 | 195.21 | 195.21 | (4,804.79) |
| FA0003558 | High Temperature Probe Nos. 2, Thermocouple Thermometer No.1 | EQ | EMC | 04/05/16 | 15 | 115,000.00 | 4,489.73 | 4,489.73 | (110,510.27) |
| FA0003047 | Stop Watch | EQ | EMC | 04/05/16 | 15 | 2,000.00 | 78.08 | 78.08 | (1,921.92) |
| FA0003038 | Impressure Meter 0-5 Ps C9505/190 | EQ | EMC | 04/05/16 | 15 | 22,000.00 | 858.90 | 858.90 | (21,141.10) |
| FA0003022 | Pressure Gauge 0.15 Bar, No 1 - 3656.25 | EQ | EMC | 04/05/16 | 15 | 3,000.00 | 117.12 | 117.12 | (2,882.88) |
| FA0003023 | Pressure Gauge 0.30 Bar, No 1 - 3656.26 | EQ | EMC | 04/05/16 | 15 | 3,000.00 | 117.12 | 117.12 | (2,882.88) |
| FA0003282 | Desicator 300Mm 12 Wheel Brand | EQ | EMC | 04/05/16 | 15 | 6,000.00 | 234.25 | 234.25 | (5,765.75) |
| FA0001792 | Laboratory Stool (China) | FU | EMC | 04/05/16 | 10.00 | 3,000.00 | 78.08 | 78.08 | 2,921.92 |
| FA0001793 | Laboratory Stool (China) | FU | EMC | 04/05/16 | 10.00 | 3,000.00 | 78.08 | 78.08 | 2,921.92 |
| FA0001505 | Wall Cupboard Upper Floor (Lf 23.08) | FU | EMC | 04/05/16 | 10.00 | 42,000.00 | 1,093.15 | 1,093.15 | 40,906.85 |
| FA0001499 | MDF Cupboard, NOS.4 | FU | EMC | 04/05/16 | 10.00 | 40,665.00 | 1,058.40 | 1,058.40 | 39,606.60 |
| FA0001507 | Cupboard 36 30" | FU | EMC | 04/05/16 | 10.00 | 7,000.00 | 182.19 | 182.19 | 6,817.81 |
| FA0000080 | Intel Pentium Computer | CM | EMC | 04/05/16 | 10.00 | 10,000.00 | 260.27 | 260.27 | 9,739.73 |
| | | | | | | 1,825,561.67 | 24,792.01 | 302,352.88 | (1,317,379.16) |

## 4. Accidents of vehicles during the year 2016

| Vehicle No | Date of Accident | Estimate Cost of Damage Rs. | nsurance Agent | Claim | | |
|---|---|---|---|---|---|---|
| | | | | Handover Date | Value Rs. | Date Received |
| 62-4004 | 17/11/2016 | 164,000.00 | NITF | 11/01/2017 | Pending | |
| KX-7908 | 10/11/2016 | 58,647.70 | SLI | 30/12/2016 | 58,647.69 | 20/01/2017 |
| 301-3740 | 22/12/2016 | 82,350.00 | NITF | Pending | Pending | |

## 5. Provision for bad debts

Bad debt provision has been given on the assumption of discounted rate at 11.81%

| Debtor | Amount Rs. | Bad debts provision Rs. |
|---|---|---|
| Ministry of Technology & Research | 6,553,446.40 | |
| Pradeshiya Saba -Kalutara | 5,965.00 | |
| Hayleys Fabric Plc. | 12,782.00 | |
| Teaching Hospital -Kurunegala | 862,920.00 | |
| Department of National Zoological Garden | 3,545,336.70 | |
| Department of Industries | 422,747.00 | |
| Department of Animal Production & Health | 1,169.57 | |
| Irrigation Engineering Office | 46,023.17 | |
| Bureau of The Commissioners General of Rehabilitation | 1,368,236.73 | |
| Urban Council Ambalangoda | 420,964.29 | 44,599.26 |
| District Secretariat Hambantota | 70,435.00 | 7,462.27 |
| Teaching Hospital Anuradapura | 304,217.14 | 61,046.18 |
| | 13,614,243.00 | 113,107.71 |

Amounts collected during the year 2017 up to the reporting date no provision for bad debts are made.

## 6. Debtors Balance Written off during the year 2016

| Debtor | Amount Rs. | Board Decision No | Date |
|---|---|---|---|
| Hiriyala Economic Centre | 637,056.40 | 5-2016,3.2 | 28/06/2016 |
| Industrial Technology Institute | 316,342.86 | 3-2016,3.2 | 23/03/2016 |
| A E Pradeep | 7,200.00 | 5-2016,6.3 | 28/06/2016 |
| Lakleya KanthaGovi Sanvidanaya | 60,171.42 | 4-2016,3.8 | 18/05/2016 |
| Ministry of Science & Technology | 104,968.29 | 5-2016,6.3 | 28/06/2016 |
| S M Azam | 42,048.83 | 9-2016-4.1 | 25/10/2016 |

## Cash Flow Note For The Year Ended 31st December 2016

Figures in Rs.

| | 2016 | 2015 |
|---|---|---|
| **01. Cash flow from Operating activities** | | |
| Receipts | 57,985,333.07 | 66,444,541.38 |
| Recurrent & Research Grants | 231,025,150.00 | 209,954,373.00 |
| Interest Received | 4,904,542.35 | 3,975,587.71 |
| Other Receipts | 1,716,378.23 | 1,073,498.79 |
| Payments | | |
| Employee Cost | (190,684,509.32) | (173,377,977.53) |
| Superannuation cost | (6,498,572.75) | (2,664,694.66) |
| Supplies | (78,776,793.81) | (75,377,777.74) |
| Other payments | (23,570,199.78) | (21,891,877.78) |
| | - | - |
| **Net Cash flow from Operating Activities** | (3,898,672.01) | 8,135,673.17 |
| **Cash Flow From Investment Activities** | | |
| Purchase of Assets | (37,622,266.37) | (27,798,491.11) |
| Proceeds from sales of equipment | - | 2,207.20 |
| **Net Cash Flows from Investment Activities** | (37,622,266.37) | (27,796,283.91) |
| **Cash Flow From Financing Activities** | | |
| Capital grant | 31,114,964.00 | 31,798,897.00 |
| **Net Cash Flow from Financing Activities** | 31,114,964.00 | 31,798,897.00 |
| **Net Increase/(Decrease) in Cash & Cash equivalents** | (10,405,974.38) | 12,138,286.26 |
| **Cash & Cash Equivalent at beginning of the period** | 105,890,568.07 | 93,752,281.81 |
| **Cash & Cash Equivalent at end of the period** | 95,484,593.69 | 105,890,568.07 |

## Notes to the Cash Flow Notes for The Year Ended 31st December 2016

### 2. Non Cash Transactions

Figures in Rs.

| | 2016 | 2015 |
|---|---|---|
| Vehicles received from Treasury | - | 7,975,000.00 |
| | - | 7,975,000.00 |

### 3. Cash & Cash Equivalent

| | | |
|---|---|---|
| Bank of Ceylon Ja-ela Branch A/C No 404949 | 2,173,287.47 | 392,345.92 |
| Bank of Ceylon Ja-ela Branch A/C No 405005 | 106,284.36 | 159,300.51 |
| Bank of Ceylon Ja-ela Branch A/C No 404956 | 429,001.16 | 904,924.84 |
| Bank of Ceylon Corporate Branch A/C No 1667 | 1,222,056.52 | 2,140,477.33 |
| Cash in Hand | 91,473.87 | 1,055,802.54 |
| Temporary Call Deposits-Ja-ela Branch | 39,800,000.00 | 55,770,000.00 |
| Temporary Call Deposits-Corporate Branch | 39,500,000.00 | 34,000,000.00 |
| State Institutional Temporary Surplus Fund | 12,162,490.31 | 11,467,716.93 |
| | 95,484,593.69 | 105,890,568.07 |

## 14. Report of the Auditor Teneral on the FInancial Statement

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கணக்காய்வாளர் தலைமை அதிபதி திணைக்களம்
**AUDITOR GENERAL'S DEPARTMENT**

මගේ අංකය எனது இல. My No. TEC/B/NERDC/1/16/46 මඹේ අංකය உமது இல. Your No. දිනය திகதி Date 24 September 2017

The Chairman
National Engineering Research and Development Centre of Sri Lanka

**Report of the Auditor General on the Financial Statements of the National Engineering Research and Development Centre of Sri Lanka for the year ended 31 December 2016 in terms of Section 14(2) (c) of the Finance Act, No. 38 of 1971**

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The audit of financial statements of the National Engineering Research and Development Centre of Sri Lanka for the year ended 31 December 2016 comprising the statement of financial position as at 31 December 2016 and the statement of financial performance, statement of changes in equity and cash flow statement for the year then ended and a summary of significant accounting policies and other explanatory information was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Section 13 (1) of the Finance Act, No. 38 of 1971 and Sub-section 2 of Section 29 of the State Industrial Corporations Act, No. 49 of 1957. My comments and observations which I consider should be published with the Annual Report of the Centre in terms of Section 14 (2) (c) of the Finance Act appear in this report. A detailed report in terms of Section 13(7) (a) of the Finance Act was furnished to the Chairman of the Centre on 13 July 2017.

**1.2 Management's Responsibility for the Financial Statements**

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The management is responsible for the preparation and fair presentation of these financial statements in accordance with Sri Lanka Public Sector Accounting Standards and for such internal control as the management determines is necessary to enable the preparation of financial statements that are free from material misstatements whether due to fraud or error.

**1.3 Auditor's Responsibility**

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with Sri Lanka Auditing Standards consistent with International Auditing Standards of Supreme Audit Institutions (ISSAI 1000-1810). Those Standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatements of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Centre's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Centre's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of financial statements. Sub-sections (3) and (4) of Section 13 of the Finance Act, No. 38 of 1971 give discretionary powers to the Auditor General to determine the scope and extent of the audit.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

**2. Financial Statements**

**2.1 Opinion**

In my opinion, the financial statements give a true and fair view of the financial position of the National Engineering Research and Development Centre of Sri Lanka as at 31 December 2016 and its financial performance for the year then ended in accordance with the Sri Lanka Public Sector Accounting Standards.

## 2.2 Comments on Financial Statements

### 2.2.1 Accounts Receivable

Action had not been taken even by 30 July 2017, the date of audit, to recover from relevant institutions, the retention money amounting to Rs.749, 110 of 03 commercial projects completed and handed over by the Centre, of which the defects liability period had expired.

## 3. Financial Review

### 3.1 Financial Results

According to the financial statements presented, the financial result of the Centre for the year ended 31 December of the year under review had been a deficit of Rs.5,744,897 as compared with the corresponding deficit of Rs.2,238,655 for the preceding year, thus the deficit of the year under review had increased by Rs.3,506,242 as compared with the preceding year. Despite the increase in the operating expenditure by Rs.36, 569,186 and the decrease in other income by Rs.2,657,516 , the increase in the Government grants and adjustment of amortization by Rs.21,070,777 and Rs.14,649,682 respectively in the year under review as compared with the preceding year had mainly attributed to the increase in the deficit.

In analyzing the financial results of the year under review and 04 preceding years, even though the deficit amounting to Rs.26,982,577 of the year 2012 had decreased up to Rs.2,238,655 by the year 2015 ,it had increased again up to Rs.5,744,897 by the year 2016. Nevertheless, in considering the employees remuneration and the depreciation on non-current assets, the contribution of the Centre amounting to Rs.179,994,271 in the year 2012 had increased continuously up to Rs.260,341,682 by the year under review.

## 4. Operating Review

### 4.1 Performance

In terms of the Notification published in the Gazette Extraordinary No.124/6 of 14 August 1974, the main objectives of operating the Centre are as follows.

- To provide for an institutional mechanism needed for the progressive development of indigenous technology by encouraging, recognizing and developing innovative and creative talent in Sri Lanka.
- To provide facilities to co-ordinate the technological, engineering and research capabilities of various public and private sector industries and institutions in a productive manner through co-operative endeavour.
- To ensure by adaption and adaptation the choice of technologies that would be consistent with the country's resource endowments national planning objectives.
- To examine direct and indirect mechanism of technology transfer and offer counsel to appropriate government and private institutions in Sri Lanka, when required to do so.
- To promote the optimal exploitation of the country's human and material resources, particularly labour and raw material resources by promoting the growth of suitable technology.
- To design manufacture, and test prototype machinery, pilot plants as demanded by industrial, commercial and other end users in an economical manner.
- To provide to continuous monitoring of technological data and documentation relating to engineering designs and research through the co-operation of international and national agencies.

- To offer sustained consultancy service to public and private sector enterprise and undertake research and promote training activities to broken the base of the country's engineering and industrial design and research capabilities.

The following observations were made in the examination carried out with regard to the achievement of above objectives.

(a) An income of Rs.502,000 from the issuance of 70 Technology Transfer Licenses and Rs.200,000 from the renewals of 137 licenses had been targeted in the year under review. Nevertheless, only an income of Rs.76,000 and Rs.89,000 had been earned from the issuance of 18 licenses and renewals of 60 licenses respectively due to the failure to complete certain technologies successfully and lack of demand for certain technologies.

(b) An income of Rs.68,000,000 from low cost constructions and providing 24 repair services by using the technology introduced by the Centre, Rs.6,160,000 from providing consultancy services for 22 building constructions and Rs.7,800,000 from the supply of goods/machines and concrete fittings had been targeted. Nevertheless, the targets achieved had been only an income of Rs.21,165,000 from 12 constructions, Rs.2,400,000 from the supply of machines and Rs.2,780,000 from 16 consultancy services due to the failure to attract the new constructions and to retain the engineers and technicians.

(c) Although it had been planned by the Designing and Consultancy Services Division to earn an income of Rs. 7,500,000 by completing 140 orders for the supply various mould designing services, only a sum of Rs. 1,967,000 had been earned by providing only 40 services without carrying out repairs on appropriate time.

(d) The physical progress of 12 projects to be completed in the year under review had ranged from 32 per cent to 90 per cent and the progress of three projects from which a progress of 55 per cent, 72 per cent and 78 per cent were expected as at the end of the

year under review had been only 16 per cent, 55 per cent and 30 per cent respectively. The leaving of engineers and technicians of the Centre and failure to carry out researches with a proper agreement with external parties were the reasons therefor.

(e) The income from the commercial project of testing the standard of imported batteries had decreased by 79 per cent, 87 per cent and 60 per cent in the year 2014, 2015 and in the year under review respectively as compared with the years 2013. The number of orders from the Sri Lanka Standards Institute being the main client, had declined due to the lack of facilities for certain tests and delay of test reports. Even though an equipment for battery tests had been purchased at a cost of Rs.10,669,625 for this project in the year 2011 without entering in to an agreement with the main client institution for undertaking orders, that equipment had remained underutilized.

## 4.2 Management Activities

The following observations are made.

(a) Even though the commercial project for fixing the automated Flap Gate in the canal at Midigamuwa, Raththotuwila had been commenced in November 2013 and expected to be completed in February 2014, three years had elapsed up to July 2017 for the completion of project. Even though the estimated income and expenditure of the project amounted to Rs.227,000 and Rs.187,838 respectively, an actual expenditure of Rs.412,417 had to be incurred due to the non-preparation of estimates after a proper study.

(b) Even though the project for improvement of Bio Gas Unit at Cadet Centre at Rantembe had been commenced in August 2014 and expected to be completed in February 2015, it had not been completed even by July 2017 and further, the project remained inactive. No proper agreement in respect of incurring additional cost, had been entered into by the two parties and even though the estimated income and expenditure of the project amounted to Rs.104,995 and Rs.95,450 respectively, a cost of Rs.122,063 had been incurred by the end of the year under review.

**4.3 Idle and Underutilized Assets**

The following observations are made.

(a) One hundred and four stock items valued at Rs.404,404 in the main stores of the Centre had remained idle for 05 years.

(b) Five equipment valued at Rs.10,459,163 belonging to the Designing and Consultancy Services Division had remained idle since the year 2015 and 05 equipment valued at Rs.51,267,312 had remained underutilized in the year under review.

**4.4 Identified Losses**

An expenditure of Rs.7,929,857 had been incurred exceeding the income of Rs.5,643,133 received from 04 projects completed in the year under review , thus a of loss of Rs.2,286,724 had sustained due to the reasons such as, failure to repair the machines on appropriate time, inadequacy of estimates and failure to enter into proper agreements with external parties.

**4.5 Delayed Projects**

Four projects of which the estimated cost amounted to Rs.15,158,706 and to be completed in the year 2015 and within the year under review had not been completed even by the end of the year under review due to the failure to enter into proper agreements and the lack of concurrence with external parties and those projects remained inactive during the year under review. Further, action had not been taken to extend the due dates of completion or to complete those projects.

## 5. Accountability and Good Governance

### 5.1 Budgetary Control

Variances ranging between 15 per cent and 67 per cent were observed between the budgeted and actual values, thus observing that the budget had not been made use of as an effective instrument of management control.

H.M. Gamini Wijesinghe

Auditor General

Sgd./ H.M. GAMINI WIJESINGHE
Auditor General

# 15. Observations of the Board of Directoros for the Report of the Auditor General

**Observation of the Members of Board of Directors with regard to the Report of the Auditor General on the Financial Statements of the National Engineering Research and Development Centre of Sri Lanka for the year ended 31st December 2016 in terms of Section 14(2)(c) of the Finance Act, No. 38 of 1971.**

**2.2. Comments on Financial Statements**

**2.2.1 Accounts Receivable**

The construction of Vidatha Centre, Saindamarudu and construction of two crematorium projects of Dimbulagala and Elahera are three projects mentioned here. The retention money of Saidamarudu Vidathe Centre construction project is to be paid by the Ministry of Science, Technology and Research. For this , the request have been made already and the Ministry has agreed to pay. Although the written and verbal requests had been made for the retention money of two crematoriums above, the payments have not been received so far. But, we are in the process of getting the retention money.

**3. Financial Review**

**3.1 Financial Results**

Agreed to the observations of financial statement.

Agreed to the contributions made in the year under review and the 4 years before.

**4. Operating Review**

**4.1 Performance**

(a) Targets were not achieved due to the failure to complete some expected technologies successfully and lack of demand for some technologies as expected.

(b) Targets were not achieved due to difficulties in recruit and retaining the engineers and technical staff and poor progress in the small and medium scale construction industry.

(c) We established Die and Mould Manufacturing Centre in year 2000 mainly to promote this technology among local manufacturing industries. This technology was the latest at that time and new to the industry. Once we established this Centre and educate the local industries about this technology, number of large scale entrepreneurs have set up these facilities themselves and start providing manufacturing services. That was our main objective in establishing this Centre too. Demand for our services have now been decreased due to the availability of this facilities at competitive level.

In addition we had to repair two CNC machines during this time and that also causes in decreasing the orders we receive.

(d) The 12 projects which were expected to complete during the concerned year are given below:

1. RED/RES/124/2014 - Development of an Aquatic Weeder
2. E&EM/RES/76/2014 - Smart Parking Monitoring System
3. MD/RES/145/2014 - Field Trial & Dissemination of Milking Machine
4. MD/RES/80/2015 - Development of Automated Water Regulation Method for Flap Gate
5. E&EM/RES/77/2014 - Study & Development of Image Processing
6. A&PHT/RES/77/2016 - Modified Version of Semi-Automatic String Hopper Machine

7. A&PHT/RES/74/2016 - Development of Smoked fish Processing Unit
8. RED/RES/78/2016 - Advancement of NERD Cremator
9. RED/RES/81/2016 - Development of a Roof Tile Drier
10. CVL/RES/111/2016 - Pre-stressed Masonry Retaining Wall
11. MD/RES/79/2016 - Data Acquisition Module
12. DF&CI/RES/91/2016 - Artificial Arm for Disables

The expected progress were not achieved for the following eight projects due to common factors affected to research projects as given below.

1. RED/RES/124/2014 - Development of an Aquatic Weeder
2. E&EM/RES/76/2014 - Smart Parking Monitoring System
3. MD/RES/80/2015 - Development of Automated Water Regulation Method for Flap Gate
4. A&PHT/RES/77/2016 - Modified Version of Semi-Automatic String Hopper Machine
5. A&PHT/RES/74/2016 - Development of Smoked fish Processing Unit
6. CVL/RES/111/2016 - Pre-stressed Masonry Retaining Wall
7. MD/RES/79/2016 - Data Acquisition Module
8. DF&CI/RES/91/2016 - Artificial Arm for Disables

Carrying out R&D projects are entirely different from carrying out construction or any other similar projects. Even though, R&D projects are carried out focusing to get expected R&D outputs, as per the Activity Plan, most of the times achieving of targets as per the plans is not possible. Progress of the R&D projects depends on methodology, quality of raw materials and talents, expertise and knowledge of Members of the Project Team and assumptions.

Sometimes, even after achieving higher percentage of progress as planned, negative results may be obtained and in such cases, physical progress comes down. In addition to that resigning of research engineers from the NERDC will directly affect to progress of projects as new engineers required more time to familiar with the R&D projects.

The reasons for less progress of the rest 4 projects are given below.

**MD/RES/145/2014 – Field Trial & Dissemination of Milking Machine**

This is a Collaborative Project between NERD Centre and national Enterprise Development authority. 10 No's of milking machine units have been produced for field testing , but the NEDA has faced a difficulty in finding suitable places for testing within the planed period. As a result ; could not achieve the targeted progress; but NERD was able to find places and field testing is being carried out.

**E & EM/RES/77/2014 – Study & Development of Image processing.**

This project was started to treat the wounds by analyzing the images of wounds. Through the basic technology has been developed; we could not find a Suitable ward or clinic for field testing. However; we have informed the health service director of health ministry and after getting a clinic in a hospital, we will be able to carry out field testing and complete the project.

**RED/RES/78/2016 Advancement of NERDC cremator for improved environmental performance**

This project is aimed to upgrade the existing NERDC cremator, improving its environmental performance. Kurunegala M.C. has agreed to construct a new crematorium building for this purpose but completion of the building was delayed.

Now the construction of the building is completed. Once the MOU between two parties signed the project could be started.

**RED/RES/81/2016 Development of a roof tile dryer for traditional roof tile industry : A collaborative projects with NERDC, Ministry of Industry and Commerce (MOIC), and Roof Tile Industry Association (RTIA)**

The progress of this project is 40%. This project is collaborated with Tile Manufacturers Association and Ministry of Industry & Commerce. Preparation & signing of MOU between the parties exceeded the planned time frame.

Reasons for poor progress of the other 3 projects in the list are given below.

**Design & Fabrication of a Hyperbaric Oxygen Chamber for Hyperbaric Oxygen Therapy**

The reasons for the progress was not being able to achieve as per the action plan 2014 are given below.

The time taken for making some parts of the design was more than that of expected, as special attention had to be given, considering the item as a bio medical equipment. This equipment is used for patients to be treated under an environment of higher than normal atmospheric pressure with 100% oxygen.

Special material had to be used, considering the safety aspects of patients. Difficulty in selecting the right material and unavailability of medical instructions at the proper time were the other reasons which cause the delay. To rectify this delay a special care has been taken in 2017 to complete the entire project.

**Development of an automated water regulating method with flap gate to mitigate flood and salt water intrusion to uplands through canal opened to sea in coastal planes**

This project had two components.

(i) Installation of a water control gate introduced by the NERD Centre to control water intrusion during the drought & to control flood water during the rainy season .

(ii) The research is done after fixing the gate in order to control sea water intrusion

The cost of the fabrication and installation the gate borne by the Agrarian Services Department.

We have been given a site at Wagggalmodara for this purpose & we fabricated the gate to suit that site.

However, due to a communication lack between Agrarian services Dept and Provincial Irrigation Dept. Irrigation Dept. has fixed a normal sluice gate at the same location. Thereafter Agrarian Services Dept. provided us a different location at Bentota. We had to change the dimensions to suit the new location and provided them the drawing of the concrete structure which should be done by them. So far they have not done it. Once they have completed the construction of the concrete structure, we can complete the installation of the gate and continue the research.

**Study and Development of Image Processing Solution for Wound Treatment**

The main purpose of this project was to take color photos of wounds in patients and to develop a method which would provide aid for doctors in accessing the condition of the wound. And this project was started to the requirement of the wound treating doctor.

We have found a method to this requirement & the next step is to carryout field testing with this developed method. Preliminary field tastings were started in Wijaya Kumarathunga Hospital Seeduwa & issues arose in carrying out field testing effectively due to patient congestion & limited availability of space.

We had several discussions with National Hospital, Colombo with regard to acquiring facility for field testing and were unable to get a positive reply.

Finally we conveyed our requirement to Director General of Health Ministry and he agreed to full fill our request. After that we have inquired from Health ministry time to time but our requirement was not fulfilled by them.

In the discussion we had with Medical Research Institute, they informed us that they are unable to provide support for us. Due to these conditions, it was unable to continue this project.

However at the end of year 2016, only Rs. 8700.00 were spent for this project. It is decided to continue and finished the project in year 2017 if the Health Sector support is provided for the project and if not will stop the project.

(e) Before installation of this Battery Tester there were delay in providing reports (Nearly 5 years back). But there were no delays in past two years. Income has been reduced due to reducing in receiving orders to us. The Battery Tester has become idling due to receiving less Battery Samples for testing.

### 4.2 Management Inefficiencies

(a) Although , this project was undertaken as a commercial project the concept is totally new. The gate was installed while the water level is high in the canal.

Due to difficulties in bringing equipment ( cranes etc.)to the site and due to bad weather the construction was delayed and the expenditure was increased.

b) The project was estimated to repair digester tanks, after emptying the sewage inside by inspection from outside. However, once empting the digester tanks it was found that the cracks are too big and repair is too difficult. Hence, we handled the job cautiously and repair of two digesters were completed.

Although we requested for the due balance since 2014 several times, we did not get a response from client's side. It is expected to solve this issue within this year.

### 4.3 Idle and Underutilized Assets

(a) Some stock items in the main stores were not moving because the main equipment related to these items had been removed from usage. Actions will be taken to remove / dispose these items.

(b) The machines indicated as idling are the supporting machinery we require time to time when we work with other main machinery. The services of the supporting equipment are very important and we cannot expect the high utility rate of them. Further ,these machines are not idling and were used when necessary.

Following are the reasons for the underutilization of the 5 machineries.

We established this Centre in year 2000 and we received large number of orders that time, but we did not receive the estimated orders in the later years . Reason for that was the establishment of similar facilities in Sri Lanka in with the advancement of technology in recent times. Many industries have started using CNC machines and causes to decrease the orders we receive Those are the reasons for underutilization of some of our machines.

Further we had a major problems with our CNC Cut and EDM machines which also causes in reject some of the orders we received and was another reason for underutilize.

Scanning machine is mainly used for making moulds for textile industry , once we make new moulds they can be used for long time without any damage to it. That also cause in decreasing orders we receive and a reason for scanning machine to underutilize.

## 4.4 Identified Losses

The 4 projects mentioned in the report and reasons for losses are given below.

### (i) Design & Manufactures Modules & Dies

At the beginning we estimated the mould cost as RS 600,000 to manufacture it by using our own machinery and human resources. Unfortunately during the time of manufacturing this mould, there was a breakdown of few machineries required to manufacture this mould. Therefore, we had to outsource some of the machining services to outside party and that cause additional expenditure of RS 200,772.00.

Since the customer insisted on the delivery date we had to spend additional money for the overtime as well. Those facts were cause for the increase of cost higher than the estimated value.

### (ii) Flap gate Athuruwella

Due to unexpected prolonged work on removing water of the canal by putting sand bags a lot of time and effort was put in causing a loss of Rs. 385,306.00 to the project.

### (iii) Flap gate Vilgoda

Sudden opening of the gate (without following the instruction) by unknown persons had caused damaged to the mechanism of the gate. To repair that damage, time & labour was consumed.

### (iv) Biogas digesters Kurunegala

Initially proposed locations for construction, were changed as per the needs of the hospital and the given places were behind the wards and were not accessible for a backhoe. Therefore digging and transportation of construction material were done with manual labour.

Bad weather( heavy rain ) also delayed the construction process and the sides of pit walls were fallen several times. Those were had to be removed manually. These reasons caused a delay and an increase of wages, subsistence and OT. Therefore actual cost exceeded the estimated cost.

However, the technology of disposal of garbage while generation of an energy source was suggested by hospital authorities. Considering the importance of the technology the project was continued until completion.

## 4.5 Delayed Projects

The delayed 4 projects which are mentioned here are:

### (i) RED/RES/92/2013 Implementing fuel wood chip feeding system

The objective of this project was to install and demonstrate the fuel wood chips feeding system developed by NERDC to feed wood chips in to tea drying furnace, at New Hopewell tea factory at Balangoda.

Field trials on operation of this machine were conducted along with the New Hopewell tea factory. Because the tea factory was unable to provide the opportunity to conduct field trials as required by NERDC, it was not possible to complete this project in year 2015.

At the discussion New Hopewell tea factory expressed their unwillingness to continue this project at their tea factory. Because of, both parties were not agreeable on suggested arrangements of field trials on the given alternative locations; arrangements have been made to close this project.

As this project was inactive, a project extension had not been taken for the year 2016.

**(ii) RED/COM/11/121/2014 - Flap gate for Waggalmodara**

This has been fabricated but installation was delayed for a long period. There are 2 reasons for the delay The original location (for which the gate was fabricated)was change by the client, Agrarian Services Dept., to Bentota from Waggalmodara.

For installation of the gate the client has to make a concrete structure. As we cannot start work till they complete the concrete structure we have not taken a period extension for the project.

**(iii) RED/COM/02/95/2015 - Repairing of stack of incinerator of Kurunegala hospital**

The project could not completed within the time due to following reasons

1) The , Kurunegal hospital were using the incinerator and getting a date from them to attend the repair was delayed
2) Our workmen were heavily involved with some other commercial activities
3) Although they provided two days during the period we could not employ our workmen on those days; in the third occasion the job was completed

**(iv) RED/RES/81/2016 - Development of roof tile drier**

This project is in collaboration with the Ministry of Industry. Although it was planned to commence in Jan. 2016, the relevant design procedure, preparation of drawings and preparation of BOQs took the whole year. The MOU between the parties was signed in Dec.2016. The project was started in Jan. 2017 and is supposed to complete in Dec. 2017.

## 5. Accountability and Good Governance

### 5.1 Budgetary Control

Among the items in the budget of the year under review, the highest variance is represented in the affairs of techno -economic promotion. It was not possible to implement promotional activities as expected.

Steps will be taken to closely monitor and control the budget.

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Chairman