

Executive Summary

National Science & Technology Management System (NSTMIS), Govt. of India entrusted National Foundation of Indian Engineers (NAFEN) to carry out the following study:-

"To assess the gaps in demand and supply position of Engineering Graduates for the next five years (1999-2004) in specified branches of Engineering (Electrical, Mechanical, Production and Industrial) and specified select infrastructure industries (Power, Oil, Gas, Petroleum, Steel/Aluminium, Automobile and Railways)".

1.00 SCOPE OF THE STUDY

This study covers the following scope:-

Supply Side (Academics)

- ◆ Electrical Engineering
- ◆ Mechanical Engineering
- ◆ Production Engineering
- ◆ Industrial Engineering

Demand Side (Infrastructure Industries)

- ◆ Power
- ◆ Oil, Gas & Petroleum
- ◆ Steel & Aluminium
- ◆ Automobile
- ◆ Railways

2.00 OBJECTIVES

- To estimate gaps (+or -) in requirement of engineers (Quantity- wise) in specified branches of engineering and for specified industries.
- To estimate gap in terms of qualitative requirements.

3.00 METHODOLOGY

- Through questionnaire & personal visits, interviews and discussions with the concerned officials. Questionnaire were framed & finalized after holding 4 Brainstorming Sessions at Delhi, Mumbai, Calcutta & Bangalore.

4.00 SAMPLE SIZE

Industry : 66% (41 Organisations out of 62 Nos.)

Academics : 35% (148 Engg. Institutes out of 418 in 1998)

5.00 ANALYSIS

A. Quantitative Analysis

The Position on various parameters emerges as follows:

- There is a steady increase of **Engineers actually graduated** from 1994-98. The average increase per year is **55%** for Electrical Engineers, **56.56%** for Mechanical Engineers, **64%** for Production Engineers and **40%** for Industrial Engineers. *(Base year 1994).*
- There is a steady increase of **Engineers actually recruited** by the select infrastructure industries from the year 1994-98, except for industrial Engineers, which is constant. The average increase per year for Electrical Engineers is **217%**, Mechanical Engineers **12%**, Production & Industrial Engineers **27%**. *(Base year 1994).*
- The average increase per year for **Engineers likely to graduate** for Electrical Engineers is **32.6%**, Mechanical Engineers **40.2%**, Production Engineers **44.5%** and Industrial Engineers **56.2%**. *(Base year 1999).*
- The average increase per year for **Engineers likely to be recruited** by the select industries is **57%** for Electrical, **10.3%** for Mechanical, and **42.3%** for Production & Industrial. *(Base year 1999).*
- For future demand, in Electrical Engineering, Production Engineering, Industrial Engineering, there is a **surplus** with respect to the select infrastructure industries. It varies from 1176 Nos. in 1999 to 1784 Nos. in 2003 in **Electrical Engineering**. Similarly it varies from 1777 in 1999 to 3599 in 2003 in **Production & Industrial Engineering**.
- In **Mechanical Engineering Branch**, there is a **shortfall**. In 1999 it is 2462 Nos. and 1846 Nos. in 2003. However, this is reduced to 685 Nos. in 1999 and in 2003, it becomes Surplus to 1753 Nos., if **Mechanical, Production & Industrial Engineering is considered together**.

B. Qualitative Analysis

The Position on various parameters emerges as follows:-

- Faculty Student ratio, both Academic & Industry want it to be as **1:10**. This is as per present norms of AICTE.
- Both Academic & Industry want teachers to be retrained after **every 3 years**.
- Both Academic & Industry want Faculty Summer training to be of **8 Weeks** duration.
- Industry want revision of Engineering Curriculum **every 3 years** where as Academics **every 5 years**.
- Industry wants Students' minimum summer training period of **16 weeks** and Academics want **12 weeks**.
- **69%** of Industry and **64%** of Academic Institutes want **Internship** before award of degree.
- **80%** of Industry and **68%** of Academic Institutes want an **Aptitude Test** before admission.
- **85%** of Industry and **56%** of Academic Institutes want **Cross Migration** during studies
- **85%** of Industry and **54%** of Academic Institutes want a **Competitive Exams** before the selection of faculty.
- **94%** of Industry and **99%** of Academic Institutes want a **Code of Conduct** and ethics for engineers.
- **64%** of Industry and **77%** of Academic Institutes wants a **Licensing System** for engineers.
- **62%** of Industry and **96%** of Academic Institutes want a **Resource Networking** between Academic Institutes and Industry.
- **62%** of Industry want **%age Marking System** and not grading system, where as **58%** of Academic Institutes want **Grading System**.
- **62%** of Industry and **35%** of Academic Institutes want **External Evaluation System** (Outsider as evaluator). **65%** of Academic want **Internal Evaluation System**.