

R&D Activities for Engineering Business in the Future

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Engineering business is an integration of informational and intellectual works to provide plant, equipment, and solutions to the customer with maximum cost-performance. The business fields of industry to which these services are provided change continuously over time, responding to current requirements. While the domain of NKK's engineering business began mainly with shipbuilding, it has since expanded to cover energy industries, environmental industries, water and wastewater, plant engineering, steel structures, and shipbuilding and offshore structures.

The severity of the business environment has required new company structures. To

Table 1 Major technologies in the engineering field

(first orders received for 2000 - 2001)
Product (technology)

Fig.2 Biotube system

Fig.3 Ax-Bow

What are the new markets that we should focus on as a target in the future? New business or new market does not necessarily mean development of completely different business area. They retain some semblance of the present and as such retain the basic technology and management foundations, or are new fields close to conventional core businesses (the distance between the new and conventional fields varies with the character of the new business).

In practical terms, the emphasis is on the areas of (1) the environment and energy businesses, (2) the technologies to extend the life of industrial and social infrastructure, and (3) the comprehensive solutions businesses. Other applications of nanotechnologies are also under consideration.

(1) The environmental and energy businesses

Resolution of global environmental problems such as global warming, and the development of a society able to recycle resources (zero emissions), are major topics. These will be implemented through the development of epoch-making energy-saving technology, renewable energy, and recycling technology etc, together with development and growth to maintain the environment and coexistence. For example, Clathrate hydrate slurry technology in the field of energy-saving, technology for a hydrogen gas for society in the field of renewable energy, and highly efficient gasifying technology in the field of recycling.

(2) The technologies to extend the life of industrial and social Infrastructure

This field is the one in which requirements invariably increase in terms of LCC (Life Cycle Cost), and considerable work is continuing in relation to technical development in preventative maintenance, estimation of residual life, and prolonging life.

(3) Comprehensive solution businesses

These businesses provide solutions to customer requirements, and needs in the wider world, in terms of the maximum cost-performance employing a business model incorporating social needs to achieve goals from the point of view of overall optimization.

The approach to globalization of society, a further major change in the enterprise environment, is considered as follows.

While there is a tendency towards protection of industries, globalization should be viewed positively as a good opportunity for growth. With globalization comes movement of business across national borders, and enterprises with creative business concepts, and technology and products, will develop into a massive international market. The creation of major opportunities for growth will be limited to businesses creating top global brands of products and technologies. Success or failure will depend significantly on the creation of unique technologies, called "Only One Technology". In this sense as well, the role of technical development is becoming increasingly important, particularly in the fields of the environment and energy which are associated with typical global requirements. NKK is very much aware of the need for resolution of these requirements to ensure strong and continuous growth.

We live in an age in which the value and price of technology and products is determined by the market, and risk-taking (and risk management) is required in seeking profits and growth. The engineering business needs an entrepreneurial approach - a strong will and a sense of responsibility and passion in one's work, and an ability to foresee market changes and develop new businesses with innovative technology. A number of possibilities exist, and much is expected of them in the future.

The great changes occurring in the business environment requires a greater speed of technical development, and a wider approach to overall optimization. It is not necessary to consider solely one's own surroundings, rather it is better to fuse the strengths of one's own company and of others in order to develop a win-win co-operative situation, and thus ensure that targets are met

earlier rather than later.

It is necessary to maintain a good balance between 'short-term development focused on strengthening competitiveness of existing businesses' and 'medium and long-term development focused on the creation of new products and businesses' in reference to current trends. In both cases the objective is to promote growth and income-earning ability of the business through strong and superior technology.

We have presented a few of my opinions in this paper for the final edition of the NKK Technical Review. The following introduces a number of research and development examples, which we consider will support the engineering business in the future. Your interest in NKK's technical approach to the future is much appreciated.