CONTINUOUS IMPROVEMENT OF THE BNFL TRANSPORT INTEGRATED MANAGEMENT SYSTEM

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Summary

The Integrated Management System of BNFL Transport and Pacific Nuclear Transport Limited (PNTL) is subject to continuous improvement by the application of established improvement techniques adopted by BNFL. The technique currently being used is the application of a Total Quality Management (TQM) philosophy, involving the identification of key processes, benchmarking against existing measures, initiating various improvement projects and applying process changes within the Company. The measurement technique being used is based upon the European Foundation for Quality Management Model (EFQM).

A major initiative was started in 1996 to include the requirements of the Environmental Management Systems standard ISO 14001 within the existing integrated management system. This resulted in additional activities added to the system, modification to some existing activities and additional training for personnel. The system was audited by a third party certification organisation, Lloyds Register Quality Assurance (LRQA), during 1997.

This paper describes the arrangements to review and update the integrated management system of BNFL Transport and PNTL to include the requirements of the environmental standard ISO 14001 and it also discusses the continuous improvement process adopted by BNFL Transport.

BNFL Transport

British Nuclear Fuels plc (BNFL) operates on an international basis in all major areas of nuclear fuel technology. The company has over 40 years experience of manufacturing uranium fuel and over 30 years experience of reprocessing and recycling irradiated nuclear fuel. The company, which operates six sites in the Northwest of England, offers nuclear fuel cycle services including:

- new fuel manufacture (including Mixed Oxide fuel)
- enrichment
- reactor operation
- reprocessing
- waste management
- transport of radioactive materials.

To complement its other fuel cycle services, BNFL has established a comprehensive transport service for radioactive materials including:

- fuel products
- irradiated fuel
- plutonium
- residues.

The principle transport operations are managed by BNFL Transport which has extensive experience of transport by air, road, rail and sea.

BNFL Transport operates a fleet of five INF 3 classified ships, through the subsidiary company PNTL for transporting nuclear materials between Japan and Europe. PNTL was established in 1975, has made over 160 voyages and covered over 4 million miles without radiological incident. A further purpose built INF 3 classified ship the MV European Shearwater, is owned by BNFL and used for transporting nuclear material between Europe and Barrow.

As well as operating the fleet of ships, BNFL Transport is also involved in the following activities:

- design of flasks and associated equipment
- flask maintenance in accordance with IAEA standards
- design and operation of integrated transport management systems
- feasibility studies
- safety, health and environment and quality services
- package approvals and licensing
- emergency response services
- decommissioning of redundant transport equipment.

BNFL Transport also operates a dedicated Marine Terminal at Barrow, approximately 40 miles south of the reprocessing plants at Sellafield. The transport flasks are unloaded from the ships and transferred to purpose-built railwagons for shipment to Sellafield. BNFL has established a wholly-owned subsidiary, Direct Rail Services Ltd, to operate the Barrow-Sellafield rail shipments.

Regulatory Requirements

The regulatory requirements for the transport of radioactive material are defined in the Regulations which are issued by the IAEA and the associated Advisory Material (Safety Series No. 37). IAEA Safety Series No. 6 requires that quality assurance (QA) arrangements be established for the design, manufacture, testing, documentation, use, maintenance and inspection of all packages, transport, in-transit storage and operations.

Figure 1: Presentation of the ISO 14001 Certificates at Barrow Marine Terminal

BNFL Transport Integrated Management System

In 1993 BNFL Transport reviewed all relevant quality standards and selected ISO 9001 as a basis of its management system. The ISO 9000 series of standards are used in other shipping companies and in major industries, including many of BNFL's suppliers.

In 1994 Lloyds Register Quality Assurance (LRQA) certificated the BNFL Transport Management System to ISO 9001 and BS 5882 and PNTL to ISO 9002 and BS 5882. During the following three years the certification body carried out 6 monthly surveillance visits testing elements of the management system. In November 1997 the whole management system was re-audited to renew the certification until October 2000. Although the management system is based on the quality standards, it also includes health and safety requirements and meets HS(G)65 Successful Health and Safety Management.

Total Quality Management within BNFL

In 1989 BNFL adopted a Total Quality Management (TQM) philosophy of continuous improvement and developed the definition of TQM as:

'the continuous improvement in the performance of BNFL in meeting, safely and cost-effectively, the agreed requirements of internal and external customers by releasing the potential of all employees.'

The TQM Principles are:

• Customer	-	agree customer requirements
	-	understand and optimise customer-supplier chains
• Cost Effectiveness and Safety	-	do the right thing
	-	right first time
	-	measure for success
	-	continuous improvement
• Employees	-	management must lead
	-	training is essential
	-	communicate as never before
	-	achievement must be recognised.

The full-scale launch of TQM throughout the company was made in 1991 and, in most areas, this commenced with a diagnostic exercise involving interviews with a selection of people from within the area, from departments which interfaced with the area and external interviews with customers/suppliers and regulators as appropriate. The diagnostic results were fed back to the relevant management teams.

An 8-day training course for TQM co-ordinators has been developed and over 500 people in the company have attended the course with many more attending shorter TQM Awareness courses.

Numerous improvement activities have been undertaken during the last 6 years in Thorp Business Group, of which BNFL Transport is a part, In total over 600 improvement projects have been initiated. Improvement work is now carried out as part of the routine business process, particularly in areas where there has been a number of people who have been trained in TQM tools and techniques.

Use of the EFQM Model

However, although improvements were undoubtedly identified and subsequently implemented, there were few mechanisms in place to measure the effectiveness of improvements or to direct the improvements to those areas where the most benefit would be felt. It was, therefore, agreed that the Company would use the European Foundation for Quality Management Model (EFQM) for Self-Assessment as a basis for future improvements. This model, created in the late 1980s, was developed in order to increase the acceptance of Quality as a strategy for developing global competitive advantage and to encourage quality improvement initiatives.

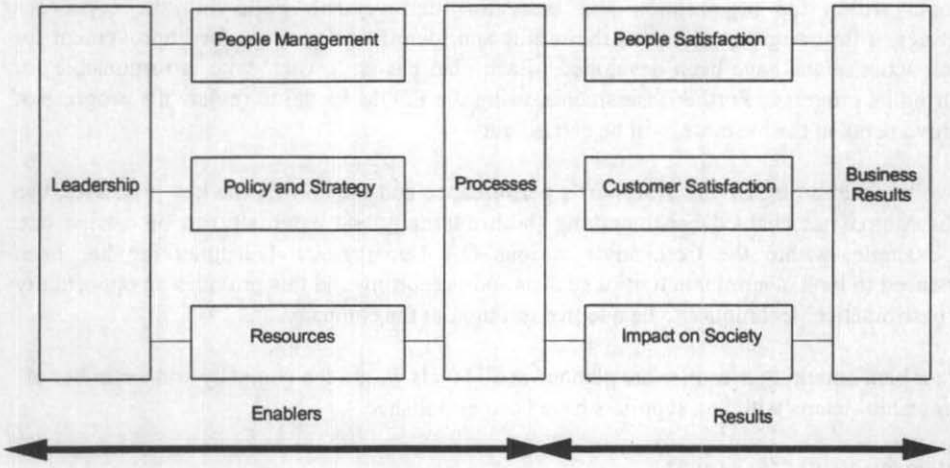

Figure 2: EFQM Model for Self Assessment

There are nine key areas of the business environment considered in the model (shown in Figure 2). Fifty percent of the 'marks' available is distributed to the 'enablers' - i.e. those activities which enable the 'business results', including people and customer satisfaction, to be achieved. The marking is allocated to the various key elements as follows:

Leadership	10%	
People Management	9%	
Policy and Strategy	8%	
Resources	9%	
Processes	14%	
People Satisfaction	9%	
Customer Satisfaction	20%	
Impact on Society	6%	
Business Results		15%

BNFL has developed a 'Business Improvement Matrix' from the criteria of the EFQM. The matrix provides a practical approach to self-assessment, which is being used by the Business Units to identify what is currently being done, to recognise the improvements that have already been made and to highlight the 'gaps' and weaknesses. Under each of the nine key categories, the matrix lists series of questions which are initially completed, on an individual basis, to reflect progress in terms of:

- the approach adopted
- levels of deployment of the approach
- the results achieved using these methods.

BNFL Transport has used this matrix to review its performance. The review was carried out by 2 teams representing some 20% of the personnel comprising a range of staff from the Head of Transport to the secretarial support and all departments within the organisation being included. Following the individual review, the team results were collated and the team then met to discuss their individual ratings and to agree a 'consensus score', to identify areas of

strength within the organisation and areas for improvement. Following the consensus meetings, a further group reviewed the results and identified five areas for improvement for which action plans have been developed. Each plan has an 'owner' who is responsible for ensuring its progress. Further assessments, using the EFQM model to review the progress of improvements in the business, will be carried out.

As well as measuring BNFL Transport's performance and identifying the key processes, use of the Matrix has enabled benchmarking (both internally and externally) to be carried out. For example, within the Company's various QA Departments, benchmarking has been introduced to look at similar activities such as audit reporting and this provides an opportunity for 'best-practice' techniques to be adopted throughout the company.

Further benchmarking activities are planned at all levels within the company and a number of 'partnership' teams with key suppliers have been established.

Implementation of ISO 14001

BNFL is committed to achieving world-class levels in safety, health and environmental performance and has developed an environmental policy which is supported by corporate objectives. In 1996 these objectives included a requirement for certification to the environmental management systems standard ISO 14001.

Current objectives relate to minimisation of the usage of some ozone depleting substances, achievement of locally set energy efficiency targets and meeting local objectives and targets which have been based on local significant environmental effects.

ISO 14001, covering environmental management is intended to provide organisations with the elements of an effective environmental management system which can be integrated with other management requirements and to assist organisations in achieving environmental and economic goals. Such a system enables an organisation to establish and assess the effectiveness of procedures, to establish an environmental policy and objectives, achieve conformance with them and demonstrate conformance to others.

A programme of work for the documentation and implementation of these requirements was developed and completed by the end of 1996. During the review of the management system to integrate environmental requirements, four new procedures together with supporting documentation were added. The topics addressed by the new documentation include environmental awareness, operational controls, identification of environmental effects and their assessment for significance and the setting of environmental objectives and targets.

In July 1997 BNFL Transport was certificated to ISO 14001 by LRQA. This certification was carried out in two phases:

Stage 1 Documentation review and examination of the identified environmental effects and their significance screening

Stage 2 Implementation Audit

It was important to BNFL Transport to ensure that the requirements of ISO 14001 were included in the existing management system, which already met the relevant quality and safety standards. This integration process ensured that only one set of documentation is used by personnel and that all aspects of carrying out the activity are covered.

The BNFL Transport environmental policy, agreed by the Head of Transport and the Corporate Safety, Health and Environment Director, commits the organisation to continuous improvement in its environmental performance and to reduce the amount of pollutants released to the environment during the performance of its activities. Suppliers and sub-contractors of BNFL Transport are encouraged to consider the environmental effects of their own operations.

Whilst many of the requirements of ISO 14001 are similar to those of ISO 9001, there are some key additional requirements. ISO 14001 requires an identification of all environmental effects due to the organisation's activities and then an evaluation of the significance of these effects. It is then required to set environmental objectives and targets for those "significant" effects and the establishment of environmental improvement programmes.

The 1997/8 environmental objectives for BNFL Transport include:

- reduction in the use of paper by 10%
- reviewing chemical usage at the Marine Terminal
- reviewing the waste incineration process on board the ships.

All BNFL Transport staff have received environmental awareness training and an ongoing training programme for sea staff is nearly completed. Job specific training on activities which may have an impact on the environment (e.g. actions to be taken during bunkering operations in the event of a spillage) has also been given.

Audits

All quality/environment standards require that an internal audit system be established and maintained and the effectiveness of this system is closely monitored by all auditors assessing the organisation. Within BNFL Transport, a formal annual audit programme is established by the Quality Manager and approved by the Head of Transport. All areas of the organisation are audited in a two year period, although those areas with particular safety implications are audited on a more frequent basis. Audits cover quality, safety and environmental aspects.

A system of process audits have been introduced within BNFL Transport whereby a particular topic e.g. a specific transport operation, is followed through all the relevant departments within the organisation. This type of audit tests the interfaces between the departments and contractors involved in the process.

Positive Auditing

Audit experience gained over a number of years has led to the use of a system of positive auditing. Previously only non-compliances and potential non-compliances were identified during audits. This created a negative impression of audits by the auditees and the auditing

process. The emphasis adopted has now changed so that audits are seen to be a positive experience with good features being recognised and reported upon and possible improvements being identified. Although findings are reported in a positive manner, it is still important to identify areas of non-compliance but the new reporting system means that they are more readily accepted and acted upon than previously. Feedback is also obtained from the auditees to measure their perception also of the value of the audit and to help identify future improvements of the audit process.

Conclusion

BNFL Transport maintains an integrated management system which is being continuously improved to meet its business needs and any requirements which are placed upon it. The effectiveness of the system is regularly checked by both internal and external organisations, and maintaining third party certification, demonstrates the commitment to the principles stated within the documented management system.

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SESSION 7.2

Waste and Source Packagings