BENCHMARKING STUDY ON MANAGEMENT PRACTICES: INSTITUTE FOR AEROSPACE RESEARCH

Submitted to
Institute for Aerospace Research
National Research Council

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EXECUTIVE SUMMARY

Objectives

The objectives of the benchmarking study were to review management practices of organizations that are comparable to the Institute for Aerospace Research (IAR), and to identify which best practices in these organizations would be useful for IAR to consider in its strategic planning process.

The study reviewed management practices at Arnold Engineering Development Centre in USA; National Aerospace Laboratory in the Netherlands; Defence Evaluation Research Agency in the United Kingdom; and Defence Science and Technology Organization in Australia.

Management Strengths of the Institute for Aerospace Research

- IAR shares common features and strengths with the benchmark organizations reviewed in this study. Strategic alliances and partnerships are highly important to IAR and to all the benchmark organizations. Group based decision-making is increasing, and effective project management and costing systems are central to all. IAR and all the benchmark organizations stress a customer/stakeholder focus in their strategic plans.

- IAR fosters research alliances with similar institutions and with industry. IAR has forged strong relationships with the dominant aerospace firms located in Canada, and there is unwavering commitment among the staff to providing excellent service to customers.

- IAR management staff, interviewed as part of this study, seemed well aware of what was going on at other aerospace organizations. They see links to these other organizations as important – although it seems that staff exchanges are not as frequent as may be desirable and even more partnerships could be beneficial.

- IAR has adapted well to less government funding during recent years. The Institute has managed well while operating on a cost recovery basis. IAR's budget was cut by relatively more than other NRC institutions.

- All the interviewees were of the view that IAR has successfully managed more with less. Some indicated that other larger aerospace organizations in different countries are surprised at how much IAR accomplishes with so little.

- IAR does a good job communicating its programs to its customers and partners, and the activities of IAR are clearly communicated to its existing and potential employees. It publishes and disseminates a large amount of material on what it does, via both published material and the IAR website.

- Strong communication links among IAR managers are maintained through regular and frequent management meetings, and through formal annual planning processes.

- IAR offers a number of on-sight and off-sight training opportunities for its employees.

- Investments have been made in an information gathering system that can be used to systematically measure and track many of these strengths and activities.

Areas for Improvement in Management Practices

IAR faces similar challenges to those faced by the benchmark organizations in this study, including adapting to declining budget appropriations, enhancing work force effectiveness, upgrading an aging infrastructure, and addressing requirements for compliance to environmental standards. The suggestions provided below mostly focus on building on IAR strengths by formally adopting strategic management tools that enhance what IAR is already doing.

Strategic management process

- IAR should continue to improve and increase communications about IAR's strategic intent, externally to private and public sector stakeholders in the aerospace industry, and internally to IAR staff. As such, IAR should develop tools to formally communicate its Strategic Plan.

- The Strategic Plan itself is only one part of the strategic management process. As such, IAR should consider transforming it into a "living document" that is referred to by IAR management and staff at least on a quarterly basis – with performance indicators built into the process for real-time evaluation, to assess achievement of targets, productivity and costs. As such, IAR should consider integrating strategic management tools into the different areas of the organization, including human resource management, marketing, communications and quality systems.

- As part of its strategic management process, IAR should consider formally adopting a long-term planning horizon for strategic management – with a five-year timeframe for setting objectives, measuring accomplishments and planning for growth; and at least a ten-year timeframe for identifying strategic intent and capital investments that are consistent with the technology roadmap set out by the Institute.

Partnerships/alliances

- IAR should continue to maintain and foster new industry, government and research alliances; to forge partnerships with local and community-based industry and economic development organizations; and to foster partnerships with international organizations involved in similar aerospace project activities.

Customer focus

- IAR's mandate to address national aerospace interests have been well served by its maintenance of a strong focus on its public and private sector aerospace customers. IAR should consider complementing its existing customer relations procedures with a formalized and ongoing customer feedback system, and to formally include Canadian aerospace stakeholders and customers in its strategic planning process.

Human resource development

- IAR is in a good position to build on existing human resource development plans by attaining commitments to existing Performance Plan Reviews and by implementing organization-wide mentoring, human resource advisory, training and staff exchange programs. An employee training needs and satisfaction survey would contribute significantly to identifying potential areas for improvement, to achieve the strategic goal of developing a high performance workforce.

Communications

- Though IAR has an effective and informative information dissemination and collection system, it could expand the information set on its Internet website to include how the IAR does its business (e.g., to include mission, vision, human resource development strategy, technology roadmap highlights), and to include an online feedback tool (to reach out to its customers and employees through surveys and reports thereof).

Marketing

- IAR should continue to increase its efforts towards describing specific projects for the purposes of highlighting positive features of these projects to stakeholders and customers. This can be partly achieved by enhancing activities-based information content on the Internet, with specific information on the competencies of the organization. It can also be achieved through organizing workshops and active participation in industry-relevant events (conferences, symposia, etc.).

I. INTRODUCTION

PricewaterhouseCoopers (PwC) was commissioned by the Institute for Aerospace Research (IAR), National Research Council, to undertake a benchmarking study on management practices. The following report provides the analysis and findings of this study.

1.1 Objectives

The objectives of this study were twofold:

- to review management practices of comparable organizations
- to identify which best practices in other organizations would be useful for the Institute for Aerospace Research to consider for its strategic plan.

1.2 Approach

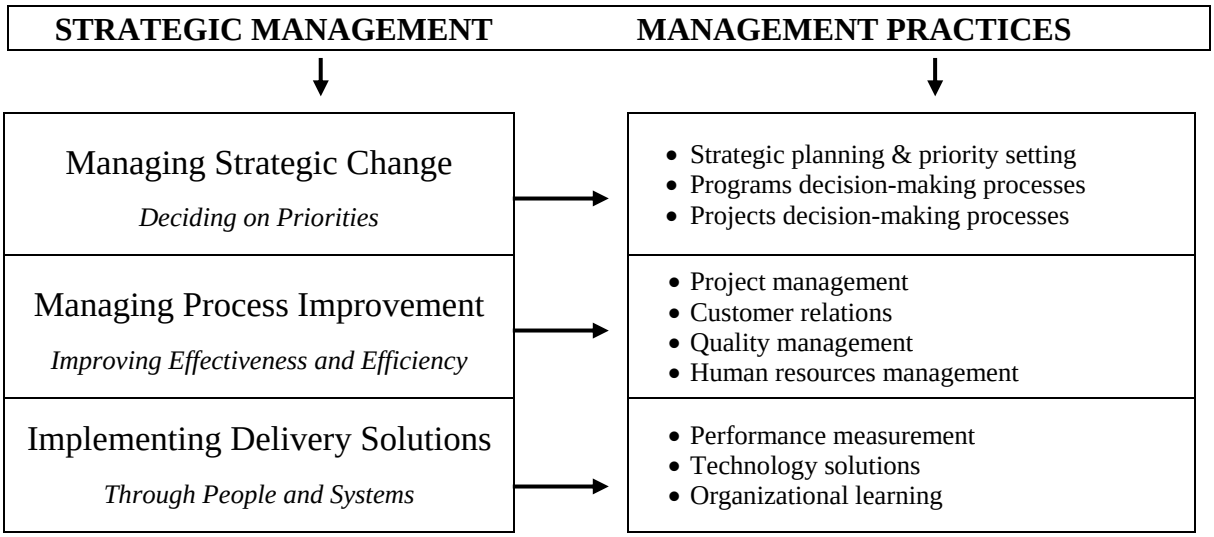
The approach adopted for this study involved a management practices framework around which to build the benchmarking study, and an information gathering process that involved interviews and a review of relevant documents.

1.2.1 A Framework for Benchmarking

PwC used a framework for benchmarking focused around the following management components and practices that govern the organizations studied:

- managing strategic change (i.e., deciding on priorities)
- managing process improvement (i.e., improving effectiveness and efficiency)
- implementing delivery solutions (i.e., through people and systems).

This framework can be illustrated as follows:



1.2.2 Selecting Benchmark Organizations

IAR has many unique facilities which combined with the expertise of its 230 staff members contribute to dynamic research in aerodynamics, structures, materials, aeroacoustics, flight mechanics, airborne science, wind engineering, aeropropulsion, icing, and other related fields. Program activities of the IAR involve the following laboratories:

- structures, materials and propulsion;
- aerodynamics; and
- flight research.

The selection of benchmark organizations was partly based on a pre-assessment of comparable program and project activities, and management practices and procedures. In addition, the organization structure, the type of customers, the sources of funding, and the focus on strategic planning were criteria considered when selecting benchmark organizations. There were no organizations that clearly met all the match-up requirements for this study. However, all organizations are involved in similar aerospace project activities. The availability of information (and responsiveness of the organizations) led to the following selection of benchmark organizations:

- Arnold Engineering Development Center (AEDC) – Tennessee, USA.
- National Aerospace Laboratory (NLR) – Amsterdam, Netherlands
- Defence Evaluation Research Agency (DERA) – United Kingdom
- Defence Science and Technology Organization (DSTO) – Australia.

1.2.3 Matrix of Findings

To compare organizations along consistent lines of evidence, a matrix approach was adopted to review the benchmarking information gathered. This comparative information is developed and presented in Annex A. The following comparative components are included in the matrix of findings:

- mission and vision of the organization
- strategic and management challenges
- strategic planning processes and objectives
- profile of organization (including size, business areas and expertise, customer base)
- effective management practices (including strategic management planning, customer relations, human resource development, and partnerships and alliances)
- performance indicators used (including quality, satisfaction and productivity).

The results of the analysis of the matrix of findings are presented in Section II of this report.

II. EFFECTIVE MANAGEMENT PRACTICES

2.1 Benchmarking Overview and Caveats

The benefits of strategic planning are uniformly understood and endorsed by all the benchmark organizations studied. Strategic alliances and partnerships are also highly important to all these organizations. Group based decision-making is increasing, and project, quality and costing systems are central management practices to all. All stress a customer/stakeholder focus in their strategic plans. Challenges facing these organizations seem consistent to those faced by IAR, namely:

- declining budget appropriations
- work force effectiveness
- aging infrastructure
- compliance to environmental standards, and
- restrictive policies.

A checklist of benchmark indicators was developed and included in a questionnaire as part of this study (see Annex B). Indicators and related questions describe management practices as shown in the right-hand side of the diagram on page 1.

Information for this study was gathered through interviews and contacts with officials of the Institute for Aerospace Research and the benchmark organizations (AEDC, NLR, DERA, and DSTO), from documents provided by these organizations (e.g., planning reports), and information obtained through Internet searches and bibliographic references.

The questionnaire in Annex B shows the benchmark checklist and indicators which measure, for example: *human resources management* in relation to measures of staff performance (e.g., core competencies, recognition, rewards); *client services and reach* through indicators such as satisfaction and quality of services; *quality management* in relation to quality system processes (e.g., documentation procedures, procurement practices).

It was not an intention to conduct a rigorous evaluation of the benchmark organizations within the terms-of-reference of this study. However, the management best practices identified by this study, are considered to be valid by the respective benchmark organizations, and have been successfully implemented within an aerospace research and development, and services, project environment -- with demonstrated positive results.

2.2 Strategic Management Process

Strategic decisions are by their nature complex, and involve many considerations and often unpredictable circumstances. There is general agreement among strategic planning practitioners concerning the need to superimpose a structure on the process of strategic management, but such structures differ among organizations, depending on their scope of activities and size. It is the process by which a plan is developed which benefits an organization, and not so much the existence of a strategic plan as such. The process of

strategic planning leads to relationships among staff, and approaches to the job, which would otherwise be lacking.

Institute for Aerospace Research

IAR has had a strategic planning process underway which matches, and in many ways is consistent with, that of organizations involved in similar aerospace research and development and similar project activities (such as AEDC in the USA and NLR in the Netherlands). IAR has developed a long term vision and mission through a consultation process with stakeholders and customers. The strategic context takes into account industry issues and opportunities that have been identified through a study process involving an evaluation of the Institute's programs, a survey of customers, case studies, peer reviews and benchmarking against other organizations involved in similar work. The IAR also undertook a technology roadmap study that contributed to the identification of technology needs and gaps in the aerospace sector.

IAR works closely with its partners and customers, to develop strategic directions to guide investments in future upgrades in facilities and professional know-how. IAR provides both research and development for the development of new technologies, and supports the Canadian aerospace community by adding value to the design, manufacture, performance, use and safety of aerospace vehicles.

The strategic planning process undertaken by IAR for the 1999-2004 planning period, provides for long term investments in equipment, research facilities and human resources. The planning horizon is balanced between short-term needs and long-term investment requirements. For example, investing in the development of a Gas Turbine Environmental Research Centre is a long-term initiative that spans well beyond a decade of applications.

Benchmark Organizations

Arnold Engineering Development Center (AEDC) has defined its strategic challenges within a five-year horizon as follows:

- coping with a declining budget;
- improving its work force effectiveness;
- renewing its aging infrastructure;
- addressing the needs of environmental standards; and
- dealing with restrictive policies.

AEDC has implemented an integrated strategic management process which, while responding to national security needs, operates with a customer focus. As part of this integrated strategic management process, AEDC has introduced best practices which involve the following:

- a quality system which rewards outstanding performers and best practices; and
- project reengineering which includes business management practices, training, information and technical data support systems, and cost reductions.

The AEDC strategic management process emphasizes group-based strategic decisions. AEDC uses a Corporate Board to reach decisions. A Strategic Management Group, with representation from stakeholders and customers, provides inputs to the Corporate Board. AEDC uses its strategic alliances to understand the needs of their commercial customers (e.g., Pratt and Whitney, Boeing) and to gain political support for their needs. AEDC's Strategic Management Group holds quarterly sessions with about 80 individuals (50 percent from outside and 50 percent from inside AEDC). Partners are included in the decision-making process (e.g., they were involved in influencing Congress to reduce fees charged to commercial clients).

Other areas of strategic management process improvement by AEDC are its quarterly reviews to track achievement of goals for their services and projects; and implementation of monthly measurement of key performance indicators such as improvement in internal and external customer satisfaction; reduction of unit cost of products and services; increase in customer business; and improvement of productivity of facilities and processes.

AEDC is also undertaking to adopt applicable ISO 14000 environmental program criteria to improve prevention and restoration, and to reduce compliance findings.

AEDC has also incorporated quality management into their culture. As such, they have subsumed continuous improvement into their organizational structure. It has become a focus for AEDC and a part of their daily work.

The National Aerospace Laboratory (NLR) of the Netherlands has instituted similar practices that are consistent with AEDC's and other organizations involved in aerospace research and development applications. Virtually all organizations in the Netherlands with an interest in aerospace developments are represented on the Board of Directors of the NLR, and as such participate in the strategic planning process.

NLR develops a five-year strategic outlook, but individual customers usually ask for more value-for-money and a shorter planning horizon for projects. To gain revenues and address budget cutbacks, NLR looks for and creates short-term market opportunities. This situation has developed in part because of the bankruptcy of Fokker Aircraft, one of NLR's primary clients.

The strategic management process of NLR requires the involvement of top management and staff in the organization. The process involves a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), undertaken by every department in the organization. The results of the SWOT analysis are fed back to the customers and stakeholders, and evaluated by an external consultant. This process ensures that all interests are taken into account in the strategic planning exercise.

Much like the technology roadmap of IAR, NLR develops a separate *technology vision document* which has a ten-year outlook. The emphasis on strategic management processes have increased over the past few years at NLR, and the involvement of their Board of

Directors, as well as staff and stakeholders, in strategic management has become an integral part of the NLR.

As at AEDC, quality management systems have been evaluated and begun to be implemented at NLR. Work procedures are documented according to quality system requirements (e.g., ISO 9001 and AQAP-110). NLR has three quality assurance certificates from a recognized quality systems Registrar (KEMA) – for their Fluid Dynamics, Space and Informatics Divisions. These Divisions hold ISO 9001 quality certificates.

Recommendations

- IAR should nurture communications about its strategic intent to private and public sector stakeholders in the aerospace industry, and to its own IAR staff.

- The Strategic Plan itself is only one part of the strategic management process. In other organizations such as AEDC and NLR, strategic planning, strategic marketing, performance and business planning are all integral subsets of the strategic management process. While a Strategic Plan has been developed by the IAR, the Institute does not appear to have formally embraced a "strategic management process" as such. Examples of formal mechanisms for strategic management have been instituted by AEDC and NLR. These include formal mechanisms for integrated "bottom-up" and "top-down" strategic management processes that involve group decision-making about projects and programs, customer relations, project management, and quality systems. Implementing formal mechanisms for assuring customer and stakeholder buy-in into the strategic management process are also explicit goals in these organizations.

- As such, the Strategic Plan of IAR should become a "living document", and IAR should refer to the Strategic Plan at least on a quarterly basis – and build into the process performance indicators for real-time evaluation to monitor target achievements and costs. IAR should adopt monthly measures of key performance indicators such as improvement in internal and external customer satisfaction; reduction of unit cost of products and services; increase in public sector and commercial customer business; and improvement of productivity of facilities and processes.

- In addition, as part of its strategic management process, IAR should formally adopt a five and ten year outlook for strategic planning -- five years for setting objectives, measuring accomplishments and planning for growth, and ten years for identifying strategic intent and capital investments consistent with the technology roadmap set out by the Institute itself.

2.3 Partnerships/Alliances

Partnerships with clients are absolutely central to successful business operation. The benefits of and, opportunities for, partnering extend well beyond just existing customers. Partnerships with suppliers can lead to improvements in both products and processes. Partnerships with local economic development government, financiers and management consultants enable the transition of new technologies into spin-offs. Partnerships with universities or other research

organizations can help to build critical mass in highly specialised areas and enable a generation of substantial synergies.

Institute for Aerospace Research

The IAR engages in numerous partnerships with industry, government and universities. These partnerships involve financial transactions, in-kind contributions, sharing of expertise and sharing of facilities. These partnerships are listed on the IAR's web site, thus illustrating the strength of the network to which it belongs.

Benchmark Organizations

The importance and nature of partnerships is clearly evidenced in the Defence Evaluation Research Agency (DERA) of the U.K. They stress the importance of partnerships with each of: technology interest groups, industry interest groups, regional interest groups, and innovation relay centres. They note many benefits of partnering. They are able to look at their partners as a broader research base that enables them to "improve the quality of the advice DERA gives to the UK Ministry of Defence". These partnerships encapsulate them in a stronger network than they would be on their own. Such partnerships also enable exploitation of spin-off opportunities.

Collaboration with industry is critical to AEDC. This is noted at all levels – at the top leadership level with boards of directors, at the functional leadership level with facility leaders, and at the supplier leadership level with lab managers. AEDC has noted several benefits from their strategic alliances. Industry access to top facilities enhances the capability of the commercial sector in two dimensions. First, it supports the competitiveness of industry. Second, it spawns spin-offs which capitalise on economic opportunities and drive leading-edge research. Moreover, to the extent that partnerships lead to improvements in the test process and technology, all AEDC customers benefit.

Several specific examples of the benefits of partnership were also cited. Alliances with Pratt & Whitney have led to a reduction of AEDC's engine installation cycle by a factor of 7, shortened Pratt & Whitney's engine certification program by 50 percent and led to follow-on work with Pratt & Whitney. The alliance with Boeing Commercial Airplane Group has also proven fruitful. The BCAG will transfer instrumentation technologies to AEDC.

Partnerships with AEDC extend beyond just the client and supplier base. They boast of partnerships with international organizations (e.g. Data Exchange Agreements, German Transonic MOU, UK/US DERA Protocol) and the community (Tennessee Economic and community development, local governments) as well. Quarterly 2 to 3 day strategic management meetings include not only members of AEDC and their customers, but other stakeholders as well.

Recommendations

- Continue to maintain and foster new industry, government and research alliances.
- Forge partnerships with the community (e.g. local economic development organizations, governments, schools).

- Forge partnerships with international organizations (e.g. standards organizations, foreign government research organizations).

2.4 Customer Focus

The IAR exists to provide national facilities to support the development of knowledge, techniques and technology within the Canadian aerospace industry, and to engage in top-quality fundamental research and development that will benefit Canadians. Ultimately, the satisfaction of the former objective in the future, is conditional on the success in meeting the latter objective now. The ability of the Institute to respond to the future demands of industry depends on the efforts put into anticipating and investigating technological phenomena of the future.

- The customers are the aerospace industry now and the aerospace industry of the future.

There are three elements to instilling and assuring a customer focus:

- Assuring a high quality of service to the customer.
- Seeking and responding to customer feedback on specific projects.
- Providing "whole solutions" to the customer by involving them in the strategic management and planning process.

Institute for Aerospace Research

About 70 to 80% of current efforts are focused on responding to customer requests, while the remainder is concerned with basic research. Both industry and the government are important customers. The relative importance of each of these varies on an annual basis. In any given year, each of these groups might account for as much as two-thirds of total contracts, or as little as one third.

There is a strong appreciation throughout the IAR of the importance of both delivering high-quality service, and developing close relations with customers. To this extent, project managers are responsible for staying in close contact with their customers, and assuring their ongoing satisfaction with projects. However, no ongoing formalised customer feedback system has been implemented.

The top-quality facilities within the institute are a key component of servicing customers. The ability to harness the expertise and opportunities offered by the facilities to create added-value by anticipating the needs and partnering in the search for solutions are what make the institute an invaluable resource to industry and the government alike. Much of this anticipation of future requirements is done in an informal way through maintaining close contacts, or through leading-edge basic research, and attention to stakeholders/customers in the planning process has increased. Nevertheless, customers are not believed to be a central, nor even in some cases at all part, of the strategic management process.

Benchmark Organizations

Several other organizations provide similar types of services to similar client groups. The National Aerospace Laboratory in the Netherlands shares the same dual mandate of supporting aerospace customers directly and providing a national centre engaged in basic and application-oriented research and development in aerospace. The split between contract work and non-contract work (70% versus 30%) appears to be quite similar to that of the IAR. Foreign customers represent a substantial portion (30%) of the customer base.

The Arnold Engineering Development Centre is dedicated to directly supporting aerospace customers by providing ground test products and services. Government customers account for 85% of the customer base, while commercial and other customers account for a much smaller proportion (12% and 3 % respectively).

Both the Defence Evaluation Research Agency in the United Kingdom and the Defence Science and Technology Organization (DSTO) in Australia have the broad mandate of helping industry become better able to support the defence capabilities of their country, while seeking opportunities for wealth creation.

Formalised customer satisfaction tracking: In regards to seeking customer feedback, institutions responding to the survey reported that they have customer feedback systems. AEDC has a customer feedback survey that they must complete prior to leaving the AEDC facilities upon completion of the project. This survey then feeds into a customer satisfaction matrix, and is associated with the fee awards. Hence, not only is information collected in a systematic way, but performance here is rewarded and, thus, further encouraged. Additionally, satisfying internal and external customers is explicitly stated as one of the top strategic objectives, and a satisfaction index is both maintained and targeted. The benefits of such measures are abundant. In one case, feedback from the customer enabled the AEDC to reduce its testing cycle from six weeks to three days.

Similarly, formalised means of targeting, tracking and responding to customer satisfaction have also been implemented at DERA in the UK. They have a customer satisfaction survey. They use this to both target increases in customer satisfaction, and seek to measure overall value for money. They were successful in achieving their target of a three percentage point increase on their customer satisfaction index for the 1997/98 year.

Sharing information with customers: The NLR takes a very active approach in sharing information back with customers. The strategic management process involves a SWOT analysis (strengths, weaknesses, opportunities, threats), undertaken by every department. The results of the SWOT analysis are fed back to the customers and stakeholders, and evaluated by an external consultant.

Customer involvement in strategic planning: In both institutes, customers are highly involved in the strategic planning process. In the NLR, virtually all organizations with an interest in aerospace developments in the Netherlands are represented on the Board of Directors of the laboratory and participate in the planning process.

Similarly, AEDC holds 2 to 3 day strategic management meetings quarterly. About 80 people are involved in these meetings, half from inside the organization and half external to the organization.

DERA has created a new organization, DERAtec, to balance the need to respond to both their Ministry of Defence and commercial customers, and more specifically, to respond to fluctuating customer demands. They narrowly missed their target for the 1997/98 fiscal year of £ 113 million in non-Ministry of Defence income, achieving £ 105.7 million.

Recommendations

- Complement existing informal customer satisfaction with formalised ongoing customer satisfaction tracking system, including: customer satisfaction surveys, summary customer satisfaction measures, targets for customer satisfaction measures, customer satisfaction dissemination mechanism, awards/consequences of customer satisfaction measures.
- Continue to increase stakeholder involvement in the strategic management process by introducing formal mechanisms for involving customers in the strategic management process (e.g., include customers on board of directors, include them in meetings and strategic document preparation).

2.5 Human Resource Development

The strength of the institute lies not in the value of the facilities, but in the ability, motivation and commitment of the staff to invent, build and apply technologies. Delivering technology-intensive services generates challenging human resource issues. Required skill sets both advance and change rapidly. Motivational factors influence the creativity and effectiveness of product development and service delivery. Continued globalisation of labour markets introduce staffing difficulties and uncertainties. Hence, preparation for an increasingly knowledge-intensive global environment requires attention to the following issues.

- Make-up of workforce.
- Measures to develop, assess and reward the workforce.
- Measures to involve and motivate the workforce.

Institute for Aerospace Research

The Institute employs 230 people. The organization if very lean and highly professional: less than 5 percent of the staff are considered to be administrative, while the remainder of employment is split between professional and technical workers.

An important issue in developing a sound human resource plan is to clearly identify what skills and expertise are required and to translate those into clear job descriptions. These appear to be part, and in some cases central, to the IAR. In order for individuals to progress and add value to the organization, they need training, mentorship on what sort of training they need (both from technical and human resource specialists), clearly defined performance evaluation mechanisms and promotion paths, they need to be recognised and rewarded for

their efforts, and they need to be involved in the strategic management process. All of these factors are also part, and sometimes central to the organization.

Several measures are currently being implemented in these areas. However, the implementation appears to be somewhat inconsistent across the different areas, and there appears to be agreement that more needs to be done in these areas. Moreover, the resources need to be made available to implement the ideas. For example, staff exchanges have been identified as a corporate initiative, but staff shortages prevent this from happening.

Benchmark Organizations

The other organizations are all much larger than the IAR. NLR has approximately 900 staff, of whom about 400 are university graduates. AEDC has almost 3000 employees, with a substantially larger proportion (14%) devoted to administration. Most of the projects (90%) are carried out by contractors. DERA is the largest (consistent with its broader mandate) with 12,000 employees, two-thirds of which are engineers or scientists.

Interviews with both the NLR and AEDC revealed that both of these institutions strive to develop, motivate, involve and reward their staff. Several interesting examples of specific means of achieving these objectives were identified.

The involvement of staff in the strategic management process is highly structured in the NLR. The opinions of the employees are actively sought, evaluated and acted upon. Both top management and staff are involved in the strategic planning process.

AEDC has set out in their vision statement, an objective of being “the workplace of choice”. They seek to nurture a high-performance workforce. All members of Team AEDC are expected to use Arnold’s strategic overview as a context for decisions in their daily work. They track improvement with a Centre Human Resources Index and strive for sustained improvement each year. They have improved the effectiveness, jobs satisfaction and the environment of the people by 40 % over four years as measured by the Standardized Quality Air Force Human Resources Development and Management metrics.

Motivation and a clear understanding of expectations and consequences are key elements of employee performance. Numerous organizations have implemented performance-based awards in order to motivate workers. A key element of this is the transparency of the process. An interesting example is offered by AEDC in the US. They have a very structured approach to assessing and rewarding performance, through their Award Fee Process. There is ongoing dialogue—daily and/or weekly—between the Air Force and contractors. There is a mid-term briefing with the Technical Area Manager after 110 days, at which point the contract receives formal feedback. After 180 days, contractor briefings are sent to the Award Fee Review Board, and Technical Area Manager briefings follow 20 days later. On day 214, the decision the AEDC commander and contractors are briefed, and the contractor is supplied with formal feedback. In cases in which contractors bring the project in under budget, they share in a portion of the cost savings. Winners of the awards are then published in the newspapers.

DERA in the UK has also specifically identified human resource management in their strategic objectives. They sought to achieve a "five percentile increase in the average score for technical capability as measured by the technical assessment scheme, and for all teams to have an improvement plan".

They have instituted numerous specific measures to spur human resource development. They have introduced a new "competency framework" that is designed to teach staff what skills they require to do their jobs. They are also putting in place an "integrated career development strategy, including training career route maps and mentoring". They offer numerous training programmes, ranging from orientation training to "role-based training for managers". They urge staff to acquire professional accreditation (in addition to formal qualifications), seek out opportunities to "broaden their horizons". Staff exchanges are strongly encouraged. They have introduced a new title of a "DERA fellow" for the most eminent scientists and engineers. They are also implementing a new titling system, "linking each individual's title to skills and achievements and separating professional standing from advancement on the pay or job ladders. Finally, they conduct an annual employee survey. They have achieved significant improvements in many areas, including internal communications and perceptions of DERA as a place to work. It also revealed that compensation needs to remain competitive and career development assistance must be maintained. However, little change in staff views of management styles was observed, despite considerable effort in this area.

Recommendations

- Build on existing human resource plans by attaining commitment to existing Performance Plan Review, committing to free resources to be able to engage in staff exchanges.
- Conduct an employee training needs and satisfaction survey to investigate potential areas for improvement.
- Institute a formal system where each of the groups develops an improvement plan that considers training, skills, promotion, etc.
- Implement organizational-wide mentoring, human resource advisory, and training programs.

2.6 Communications

Effective performance in any organization is critically dependent on effective communications. There are several essential components of any communications strategy. The first is who is being communicated with (e.g. employees, existing and potential customers, and partners). The second is the medium in which it is communicated, including through: personal contact, web sites, links with Internet directories and other sites, conferences, meetings, press releases, publications, newsletters. A third element is what is communicated (i.e. project overviews, client lists, etc.). The nature of the communication (i.e. disseminating versus acquiring information) is also an important consideration in the communications strategy. Finally, the presence of an individual who is both responsible and

accountable for maintaining effective communications is demonstrative of the commitment to effective communication systems.

Institute for Aerospace Research

The management team at the IAR meets every three weeks to review activities. The IAR communicates with its customers and research partners on an ongoing basis, in an informal way. The IAR also disseminates information to employees and customers through published information, the web site, and a newsletter. These provide an overview of the activities of the institute, discussions of specific projects and lists of, and links to the various partners. The web site also offers visitors the opportunity to pose questions of the marketing director, and enquires about some basic information from the visitor.

Benchmark Organizations

Both DERA and AEDC have an extensive coverage of descriptions of their activities and specific projects, annual report, mission, vision, history, strategic objectives, performance targets, human resource strategy, partners and a host of other factors.

AEDC maintains formalised regular contact with stakeholders by hosting quarterly strategic management meetings.

The AEDC publishes the award winners from their Award Fee Review Process in the newspaper.

Recommendations

- Expand the information set on the Internet to include how the IAR does its business (e.g. include mission, vision, human resource development strategy, etc.).
- Communicate strategic plans to all employees and stakeholders, and seek out feedback on an ongoing basis.
- Increase use of formalised information collection and dissemination (i.e. customer and employee surveys and reports thereof) systems, to enhance communications with customers and employees.

2.7 Marketing

Marketing is a key component of any organization, for attracting customers, partners, employees, and public support. Describing the activities that the organization engages in is an important element of this. Marketing also generally extends beyond describing products and services; it involves “selling the organization” and “selling the competencies of the organization”. This involves marketing not just what the organization has done, but what it could do for customers. In order to do the latter, it is important to relay stories of situations in which the organization created real value for its customer beyond just providing the standard product or service. It is also worthwhile to describe the make-up, aspirations and behaviour of the organization. Descriptions of these activities enable potential customers, employees, partners and the public to judge for themselves how credible they feel the organization is.

Institute for Aerospace Research

The IAR presents an overview of the facilities and activities on the web site. In addition, it publishes a newsletter periodically to highlight specific stories of projects. These stories are devised so as to communicate very specific messages—for example employee enthusiasm, added-value to a customer or to illustrate forward-thinking behaviour—to customers and employees. Similarly, the IAR publishes papers and attends conferences, demonstrating its leading role in research and development.

Benchmark Organizations

Each of the other organizations describe their facilities and activities on their web site, publish, and attend conferences.

Some organizations have also implemented effective means of highlighting how they add value to their customers. For example, the AEDC states that: alliances with Pratt & Whitney have led to a reduction of AEDC's engine installation cycle by a factor of 7, shortened Pratt & Whitney's engine certification program by 50 percent. They specifically quantify the value that they add, thus justifying their activity. AEDC also publishes the names of contract award winners in the newspapers. This illustrates the performance of both the contractor and the organization as a whole.

DERA does an excellent job of demonstrating the competencies of the organization. Customers here are given the impression that if they bring their business to DERA, DERA will strive to offer the highest quality, in the best time and price range.

Recommendations

- Continue increasing efforts towards describing specific projects for the purposes of highlighting positive features.
- Enhance activities-based information content on the Internet with information on the competencies of the organization (as evidenced by management practices and human resource practices).

ANNEX A

ANALYSIS OF BENCHMARKING ORGANIZATIONS

Strategic Management Practices Fact Sheet
Arnold Engineering Development Center (AEDC) -- Tennessee, USA

Mission

- To provide the world's most effective and affordable aerospace ground test products and services to customers
- To ensure ground test facilities, technologies, and knowledge are viable for today's and tomorrow's customers

Vision

- The test center of choice
- The workplace of choice
- A model of environmental excellence

Challenges

- Declining budget
- Work force effectiveness
- Aging infrastructure
- Environmental standards
- Restrictive Policies

AEDC's Strategic Planning Process

- Who are we?
- Where are we today?
- Where are we going?
- Our strategic goals?
- How will we get there?

Strategic Objectives

- Satisfy internal and external customers and stakeholders
- Reduce the unit cost of products and services each year
- Increase overall external customer business
- Improve productivity each year
- Nurture a high-performance work force

Profile

- Work force: 2,973 (30% engineers/scientists; 5% managers/supervisors; 15% technical staff; 14% admin staff; 36% craft)
- $6 billion investment
- High performance organization
- 58 test cells (27 unique in North America; 14 unique in the World)
- Business areas and expertise
  - ✓ turbine engines (engine performance and operability; engine/inlet integration; environmental/climatic)
  - ✓ aerodynamics – flight dynamics (high performance flight simulation; store separation simulations; engineering approximations)
  - ✓ space and missiles (rockets; space; hypersonics/reentry)
- Clients (customer dollars: % of $US 320million – FY98)
  - ✓ DoD/Government (63%)
  - ✓ NASA (2%)
  - ✓ Commercial (12%)
  - ✓ Other (3%)
- Strategic management processes
  - ✓ Respond to national security needs
  - ✓ Dictated by military application of technology

- ✓ Operate with a customer focus

Remarks: AEDC's Effective Management Practices

- What AEDC is doing to improve:
  Developing an integrated strategic management process which includes:
  - ✓ Quality journey (quality systems, outstanding performers, best practices)
  - ✓ Alliances and partnerships (benefits, feedback, investment plans)
  - ✓ Reengineering projects (business management, training, support systems, cost reduction, customer services, information systems and technical data management)
  - ✓ Infrastructure improvement and modernization (equipment/facilities)

- Formal outsourcing model with following features:
  - ✓ Command model (DoD)
    (Manage; schedule; set priorities; fund; set business strategies.)
  - ✓ Contract model (support contractors)
    (Operate; maintain; support.)

- Customer focus
  - ✓ Strategic management; linking strategy to task through corporate processes
  - ✓ Contract administration
  - ✓ Managing and operating the center
  - ✓ Strategic management: the rhythm of center decision-making

- Award fee scheme
  - ✓ Structured approach; continuous process; feedback to contractors; feedback from contractors.
  - ✓ Award fee review board; performance evaluators.
  - ✓ Series of awards (e.g., Commander's Unit Quality Award, AF Organization Excellence Award, etc.)

- Performance and area plans at organizational and program levels

Remarks: AEDC's Performance Indicators

- *Measuring performance against strategic objectives:*

  - ✓ Satisfy internal and external customers and stakeholders
    - Strive for a satisfaction index of at least 5.5 out of a possible 6.0

  - ✓ Reduce the unit cost of products and services each year
    - Reduce costs per unit by about 5% per year and achieve a yearly cost reduction

  - ✓ Increase overall external customer business
    - Increase customer revenue by 5% per year, but not by raising prices. Pass along a share of cost reductions to customers.

  - ✓ Improve productivity each year
    - Seek to improve productivity of facilities and processes by about 5% per year. Satisfy customers with fewer people, less infrastructure, and in less time.

  - ✓ Nurture a high-performance work force
    - Develop a highly skilled, motivated work force. Track improvement with a Center Human Resources Index and strive for sustained improvement each year.

- *Other performance measures:*
  - ✓ Adopt applicable International Organization for Standardization (ISO) 14000 environmental program criteria to improve prevention and restoration, and to reduce compliance findings by 50 percent per year.
  - ✓ Improve the effectiveness, job satisfaction, and the environment of our people by 40 percent over four years as measured by the Standardized Quality Air Force Human Resources Development and Management metrics.
  - ✓ Increase domestic aerodynamic, propulsion, and space and missile business by 25 percent and international business by 50 percent in five years without reducing the remainder of our business base.

Additional Remarks

- All members of "Team AEDC" are expected to use Arnold's strategic overview as a context for decisions in their daily work.
- AEDC's Strategic Plan is set within a 5 to 10+ year horizon – 5 years for objectives accomplishment and 10+ years for strategic intent.
- In 1997 Arnold developed a Year 2025 Scenario: AEDC's leaders and supporters created this scenario after considering current trends that may influence AEDC in the era between 1997 and 2025.
- Resources devoted to strategic planning: two Strategic Management Group workshops employing 80 people per workshop per annum; 12 Corporate Board meetings per annum. Estimate of $80,000 for SMG workshops and $9,000 for Corporate Board meetings.

Questionnaire Highlights

- There is more participation now from lower-level managers and professional staff in strategic planning, than in the past.
- The management system emphasizes control more than before.
- In Arnold's integrated strategic management system, strategic planning, strategic marketing, performance and business planning are all subsets of strategic management.
- Strategic management process emphasizes group-based strategic decisions.
- Arnold uses a Corporate Board to reach decisions. A Strategic Management Group provides inputs to the Corporate Board.
- Strategic management process emphasizes involvement of clients/customers.
- Strategic management process emphasizes involvement of business/partners.
- There is an increase in attention to stakeholders/clients in the planning process.
- Arnold uses strategic alliances to understand the needs of their commercial customers and to gain political support for their needs.
- Arnold uses quarterly reviews to track achievement of goals for their services/projects/programs; and monthly measurement of key performance indicators.
- Arnold has incorporated quality management into their culture. As such, they have subsumed continuous improvement into their organizational structure. It is a focus for AEDC and a part of their daily work.
- Marketing strategy is multidimensional including published information on projects, programs, and organization's capabilities and services, website, information center.
- A customer feedback system gathers, analyzes, and communicates customer/client satisfaction.
- Customer feedback is tracked for every project and is a strategic objective.
- Performance is measured regularly and is directly linked to achievement of strategic objectives.
- Arnold's strategic management process specifically includes project evaluation.
- Tendency to rely on outside consultants for strategic planning is down.

Strategic Management Practices Fact Sheet
National Aerospace Laboratory (NLR) – Amsterdam, Netherlands

Mission
- To provide expert contributions to activities in aerospace and related fields.
- To render services to government departments and international agencies, aerospace industries and aircraft and spacecraft operators.

Vision
- Intent is to achieve added-value for the Dutch economy.
- NLR is focussed on research, development and testing.
- Its activities have shifted from national to international support, due to the disappearance of Fokker, the former Dutch Airplane manufacturer.

Challenges
- Survival of industry in Netherlands after the bankruptcy of Fokker Aircraft.
- Participation in European Airbus programmes.
- Budget freeze to level of 1997.
- Giving aerospace technological support to the Netherlands knowledge infrastructure.
- Support of Royal Netherlands Air Force and Navy and expectation to grow share of space technology activities in the Netherlands.

NLR's Strategic Planning Process
- Virtually all organizations in the Netherlands with an interest in aerospace developments are represented on the Board of Directors of the laboratory, and as such participate in the strategic planning process.
- NLR develops a five-year strategic outlook. Individual customers ask for more value-for-money and a shorter planning horizon for projects.
- Shorter-term market opportunities for NLR are looked for and created.
- The strategic planning process requires the involvement of top management and staff in the organization.
- The current Strategic Plan of NLR (still in draft form) has been developed with the involvement of management and staff.
- The process involved top-down and bottom-up activities. The bottom-up activities involved a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) undertaken by every department.
- The results of the SWOT analysis were fed back to the customers and stakeholders, and evaluated by an external consultant (Van den Muisenberg).

Strategic Objectives
Strategic objectives are defined specifically for each of NLR's divisions:
- Fluid dynamics division
- Flight division
- Structures and materials division
- Space division
- Informatics division
- Electronics and instrumentation division
- Engineering and technical services

Profile
- Work force: approximately 900 staff, of whom 400 are university graduates. About 60 percent of the staff are posted in Amsterdam, and 40 percent in the Noordoostpolder.
- In 1997, NLR's turnover was 143 million guilders ($CDN 105 million).
- NLR carries out research and development activities covering a wide range of technological areas, to meet present and future requirements of customers.
- NLR is active in civil and military aeronautics and spaceflight.

- In 1997, civil and military activities amounted to 65 percent and 35 percent respectively of NLR's work. About 30 percent of the work under contract was carried out for foreign customers.
- Business areas and expertise
  - ✓ Aircraft development
  - ✓ Aircraft operations
  - ✓ Air traffic management
  - ✓ Policy concerning air transport
  - ✓ Spacecraft system development
  - ✓ Spacecraft utilization
  - ✓ Remote sensing
  - ✓ Non-aerospace
- Clients
  - ✓ National customers include the Netherlands Agency for Aerospace Programmes; the Royal Netherlands Air Force, Army and Navy; KLM Royal Dutch Airlines; the Netherlands Department of Civil Aviation, Air Traffic Control; the Netherlands and Amsterdam Airport.
  - ✓ Major international customers include the European Space Agency, the European Union, Eurocontrol and several other European aerospace organizations.
- About 70 percent of NLR's activities consists of research and development under contract. For its basic research program and for the development of specialized research equipment, NLR receives government subsidies.
- Strategic management processes
  - ✓ Respond to customer needs
  - ✓ Are dictated by national interests

Remarks: Management Practices

- NLR has implemented a quality system based on the ISO 9001 standards. KEMA Registered Quality has granted NLR three quality assurance certificates: the Fluid Dynamics, Space and Informatics Divisions hold ISO 9001 quality certificates.
- In addition, the Dutch Council for Accreditation has granted NLR four Accreditation Certificates: for calibration, for forces and for electronic quantities, and a test certificate for EMC measurement.
- Project work is carried out by project groups, composed of specialists in various technological disciplines. Work procedures are documented according to quality system requirements (e.g., ISO 9001, and AQAP-110).
- The Strategic Planning horizon is 5 years at NLR, but fundamental research is looked at within a 20 year horizon. For instance, a supersonic airplane is not expected to fly until ten years after the first ideas have been examined.
- Installations for testing (e.g., wind tunnel) have an economic life of 30 years. Therefore, a separate *technology vision document* is made which has a 10-year outlook.
- NLR undertakes frequent reviews to verify whether activities comply with plans (monthly).
- Bi-weekly reviews of progress are undertaken to verify that activities are on schedule.
- Frequent communication of status on achievement of goals is provided to customers (more than quarterly).
- Resources devoted to strategic planning: the current Strategic Plan has taken 2 man years to make (mainly 2 intensive months for 5 people and 1 intensive month for 12 people), and some NLG 150k (CDN$110k) in consultant fees. It took 3 Board meetings and 5 Directors' Meetings. For previous Plans this was just 1.5 man months.

Remarks: Performance Indicators

- Project evaluation is done individually and does not influence the Strategic Plan – each Manager evaluates projects on a per-customer basis.
- A customer feedback system gathers, analyzes, and communicates customer/client satisfaction.
- Management practices provide for sharing of information with customers/clients.
- Individual project reports identify product or service problems.

Questionnaire Highlights

- There is a high level of participation from lower-level managers and professional staff in NLR's strategic planning process.
- Group-based decision making is very much part of the process at NLR.
- Involvement of professional and technical staff, and customers/clients, are very much part of the strategic planning process.
- Involvement of government departments is very much part of the strategic planning process.
- Emphasis on strategic planning has increased over the past three years at NLR.
- Involvement of the board of directors has increased in strategic planning.
- Attention to stakeholders/clients needs in the planning process has increased over the past three years.
- Account managers
- NLR has a tendency to rely on outside professional consultants for strategic planning.

Strategic Management Practices Fact Sheet
Defence Evaluation Research Agency (DERA) – United Kingdom

Mission

- To provide independent, high quality, efficient and cost-effective scientific and technical services to its customers. It exists primarily to serve its Ministry of Defence (MOD) customers, but the exploitation of the wealth-creation potential of programmes of work and facilities required for defence purposes is a legitimate parallel objective.
- To harness Science and Technology to UK defence needs

Vision

- To be recognized as the world's foremost Defence Science and Technical Organization and thus be a source of pride to our owners, customers and staff.

Challenges

- To pursue every opportunity to drive down costs by rationalizing activities particularly in the support area.
- To explore more flexible and innovative ways in which to meet the technical challenges posed by customers' future needs.
- Achieve annual and 3 year targets:

Strategic objectives

1998/99 Targets

- To achieve a return on capital employed of 6.0%
- To keep the annual rise in standard manpower rates below the annual rise in the RPI
- To increase non-MOD income to £122 million
- To increase the number of DERA staff elected as Fellows to profesional bodies by 10%
- To achieve 90% of MOD customer milestones on time
- To achieve an improvement of 5% in the score for project management in the Customer Satisfaction Survey and to maintain overall satisfaction as measured by the core questions
- To increase the value of jointly funded projects with industry by 10% 3 year targets
- Over a period of 3 years to achieve a 20% increase in peer reviewed publications per professional
- Over a period of 3 years, to increase by 50% the number of scientific teams assessed as world class in the technical assessment exercise

Profile

- Work force: 12,000 (8,000 scientists and engineers, as well as 460 seconded military staff)
- Largest research organization in Europe
- £ 1 billion turnover
- High performance organization
- Business Area and Expertise
  - Defence Research Agency (DRA)
  - Defence Test & Evaluation Organization (DTEO)
  - Centre for Defence Analysis (CDA)
  - Protection and Life Sciences Division (PLSD)

The four divisions were themselves organized into sectors. In April 1997, the structure of DERA was simplified further and the four divisions were removed. DERA now comprises of fifteen business sectors:

- Air systems
- Land systems
- Sea systems
- Weapons systems
- Command & information systems

- Electronics
- Sensors and processing
- Structural Materials Centre
- Centre for Defence Analysis
- Centre for Human Sciences
- Biological & chemical defence
- Chemical and electronic systems
- Test and evaluation: ranges
- Test and evaluation: facilities
- Aircraft test and evaluation

- Clients
  - ✓ DERA actively seeks to collaborate with other organizations.
  - ✓ Scientific and technical services to other government departments
  - ✓ Technical and scientific services to meet the requirements of other customers (national and international)
  - ✓ Strong international component.

- Strategic management processes
  - ✓ Respond to national security needs
  - ✓ Dictated by military application of technology
  - ✓ Operate with a customer focus.

Remarks: Effective Management Practices

- What DERA is doing to improve:
  - ✓ Look closely at the lessons that can be learned from benchmarking as a guide to best practice.
  - ✓ Take every opportunity to break away from bureaucratic working practices and hierarchical structures that inhibit innovation, and to encourage scientific and technical excellence.
  - ✓ Urge staff to acquire professional accreditation in addition to their formal qualifications and to be active in developing their careers, taking opportunities to broaden their horizons and improve their skills. DERA's internal job opportunities market (2,000 were advertised last year) provides a good starting point and details of job opportunities in MOD generally are also circulated. Staff can transfer easily into and out of DERA and interchange with MOD and industry is encouraged (78 staff are currently seconded to other parts of MOD). For their most eminent scientists and engineers they are introducing a new title of DERA Fellow and are looking at new ways of stimulating original thought and the development of fresh ideas. More generally, while it is not possible to eliminate workplace pressures entirely, DERA is looking at ways of making their policies more family-friendly, for example, through improved provision for childcare, and by improving internal communications.)

- Customer focus
  - ✓ Conduct customer satisfaction surveys
  - ✓ Target customer service levels

- Award fee scheme

  DERA broke away from traditional Civil Service pay system and offers new arrangement: rewarding people according to the value they bring to the business.

  - ✓ A number of other changes are currently being implemented. Principal among these is a new system of employee titles which is due to be introduced in September to supersede the grading structure. By linking each individual's title to skills and achievements, and separating professional standing from advancement on the pay or jobs ladders, we

encourage the full development of potential and will enhance employability, an important consideration since in future we expect that more people will want to join us for a period to gain experience in a high quality technology environment rather than for a full career.

- ✓ DERA's people are primarily responsible for their own career development but DERA recognises that, if this is to be successful, it has to be done in partnership with the organization. A new system of resource management has been created for this purpose and DERA is working hard to ensure it is effective.
- ✓ DERA is also putting in place an integrated career development strategy, including training, career route maps and mentoring, to help staff acquire the knowledge and skills they need at each stage of their careers and DERA is reviewing their competence framework to ensure it fully reflects what is required.
- ✓ Finally DERA is looking again at their recruitment strategy so that they can continue to attract the people they need in a more competitive market. In line with the White Paper on Training and Development in the Civil Service DERA is aiming to have achieved IiP accreditation by 2000.

Remarks: Performance Indicators

- *Measuring performance against strategic objectives:*
  - Achieve 6% return on Capital over 3 years
  - Achieve a 3% increase in customer satisfaction (as measured by an external survey and to develop with customers a methodology for measuring overall value for money
  - Achieve a 5% increase in av. Score for technical capability
  - Increase non-MOD income by Pounds 113million
  - Measure number of key capabilities that are dependent on more than 50% of their income
  - Overall improvement of 3% as measured by internal survey
  - Improve technology transfer practices by 10%
  - To measure business excellence and improve by 15%

Additional remarks

- Launched as a trading fund in 1995, meaning it competes for business on a quasi-commercial basis, DERA, owned by the Secretary of State, is required to operate in a commercial manner. It has predetermined performance targets, and is financed by income earned from its customers.
  - It pursues every opportunity to drive down costs by rationalizing activities particularly in the support area.
  - It explores more flexible and innovative ways in which to meet the technical challenges posed by customers' future needs.
- In the next few years, DERA will give priority to the delivery of its world class science and technology base.

Strategic Management Practices Fact Sheet
Defence Science and Technology Organization (DSTO) -- Australia

Mission
- To help industry become better able to support the capabilities needed to defend Australia.
- To contribute through industry to national wealth creation.

Vision
- Perform activities directly in support of Defence requirements.
- Complete commercial contracts for the provisions of goods and services on commercial terms to industry.
- Ensure collaborative arrangements between Defence and industry or other R & D organizations.

Challenges
- To raise awareness about DSTO's work on the force-in-being. Specifically, to show the pay-off in terms of money saved.
- To make high technology the key to the nation's defence.

DSTO's Strategic Planning Process
- Planning process involves major stakeholders
  - improving the capacity of local resources
  - supports the strengthening of links with industry
- Connected to overall Defence goals.
  - Inputs from the 1994 Defence White Paper, *Defending Australia,* are central to the strategic planning process.

Strategic objectives
- Assist in the achievement of Australia's defence through technology.
- Assist in the development of a strong industry base to meet the priorities of Defence self-reliance.
- Deliver substantial returns on the ADF's investment in platforms.
- Provide impartial and informed advice on science and technology best suited to Australia's defence and security needs.

Profile
- DSTO is part of the Department of Defence.
- The industry focus is key to DSTO. This strong link is interesting considering its overall focus on supporting Australia's defence objectives.
- Operates two R & D laboratories
  - The Aeronautical and Maritime Research Laboratory (AMRL)
  - Electronics and Surveillance
- There are eleven R & D divisions
  - The Aeronautical and Maritime Research Laboratory (AMRL) contains the following divisions: Airframes and Engines, Air Operations, Maritime Operations, Maritime Platforms, Weapons Systems.
  - Electronics and Surveillance contains the following divisions: Takari (a major command, control and communications and intelligence and information operations (IO) R & D program), Communications, Electronic Warfare, Information Technology, Land Operations, Surveillance Systems.

Remarks: Effective Management Practices

- DSTO Science Industry and External Relations Branch
  - Assists in the development of industry interaction
  - Develops policy
  - Monitors the strategic direction and support implementation of industry interaction.

ANNEX B

INTERVIEW QUESTIONS AND BENCHMARKING CHECKLIST

Institute for Aerospace Research (IAR) – Benchmarking Study Checklist and Questions for Benchmark Organizations

1. MANAGING STRATEGIC CHANGE

1. What is the objective of your organization? In other words, what is your organization hoping to achieve?

Comments:

2. I am going to read to you a list of statements related to strategic management practices in your organization. *Please indicate for each statement whether you (1) strongly agree, (2) agree, (3) have no opinion, (4) disagree or (5) strongly disagree.*

☐ Our plans today reflect implementation concerns.
☐ We have improved the sophistication of our strategic planning systems.
☐ Our previous approaches to strategic planning are not appropriate today.
☐ Today's systems emphasize creativity among managers more than our previous systems did.
☐ Our strategic planning systems today are more consistent with our organization's culture.
☐ We are more concerned about the evaluation of our strategic planning systems today.

The next few points pertain to who or what is involved in strategic management

☐ There is more participation from lower-level managers and professional staff in our strategic planning.
☐ Our tendency to rely on outside consultants for strategic planning has been on the decrease.
☐ Our systems emphasize control more than before.

The last two points pertain to the importance of strategic management practices

☐ Long-term planning in our organization is generally viewed as a luxury today.
☐ Reducing emphasis on strategic planning will be detrimental to our long-term performance.

Comments:

3. Which of the following characterize the strategic management process in your organization? *Indicate whether each of the following are (1) very much part of the process in your organization, (2) somewhat part of the process, (3) not part of the process.*

☐ Group-based strategic decisions
☐ Involvement of technical staff in process
☐ Involvement of professional staff in process
☐ Involvement of clients/customers
☐ Involvement of business partners
☐ Involvement of government departments

Comments:

4. A number of benefits are usually attributed to a strategic management process. *Indicate whether each of the following benefits result from the strategic management process in your organization: (1) strongly agree, (2) agree, (3) neutral, (4) disagree, (5) strongly disagree.*

- ☐ Goal achievement is more likely
- ☐ Change is facilitated where necessary (resistance to change reduced)
- ☐ Improved revenue generation
- ☐ Better (more appropriate) targeting of programs and projects
- ☐ Enhanced ability to prevent problems
- ☐ Gaps and overlaps are reduced/prevented
- ☐ Other (please state)

Comments:

5. Please indicate which of the following *(1) have increased during the past three-years in your organization, (2) have not changed, (3) have decreased.*

- ☐ Overall emphasis on strategic planning systems.
- ☐ Involvement of program and project managers in strategic planning activities.
- ☐ Involvement of the chief executive in strategic planning.
- ☐ Acceptance of the outputs of the strategic planning exercise by top management.
- ☐ Involvement of the board of directors (or equivalent) in strategic planning.
- ☐ Resources provided for strategic planning.
- ☐ Consistency between strategic plans and budgets.
- ☐ Attention to stakeholders/clients in the planning process.
- ☐ The planning horizon (that is, the number of years considered in the strategic plan.

Comments:

6. In your view is the involvement of each of the following stakeholders in the strategic planning process *(1) very high, (2) high, (3) medium, (4) low, or (5) very low*?

Inside stakeholders:

- ☐ Board of directors (or equivalent, e.g., the Council as in IAR)
- ☐ Executive officers (e.g., Director General level, Lab Directors)
- ☐ Managers (e.g., marketing managers, project managers, financial managers)
- ☐ Staff (professional and technical)
- ☐ Military personnel
- ☐ Other government personnel

Outside stakeholders

☐ Clients/customers in private sector (e.g., aerospace manufacturers, commercial airlines)
☐ Government departments (e.g., department of defence, regulators)
☐ Other outside stakeholders (Who are they?)

Comments:

7. How long is your planning horizon (e.g. 3 years, 5 years, 10 years)?

1. Could you please give me an estimate of the resources devoted to planning? (e.g. amount of personnel time devoted to planning, number of board meetings, contracting of consulting services)

2. What is the link between project evaluation and strategic planning? (e.g. Is the strategic plan revised according to project evaluation?, Does the strategic plan specifically include project evaluation?)

2. MANAGING PROCESS IMPROVEMENT

1. Approximately what share (%) of your clients are:

☐ Government sector (state internal or external)
☐ Private sector/industry (state industry sector)
☐ Not-for-profit organization (state type)

2. Is your client list available through:

☐ Your website
☐ Mail/fax
☐ Other
☐ Or is this list proprietary

3. I am going to read to you a list of statements about how your organization addresses customer/client relationships. Please indicate whether each of the following statements *(1) characterizes your organization very well, (2) characterizes your organization a little bit, or (3) does not really characterize your organization.*

- ☐ A customer feedback system gathers, analyzes, and communicates customer/client satisfaction.
- ☐ Management practices provide for sharing of information with your customers/clients.
- ☐ An easily accessible information sharing system (e.g., electronic databases, product test result reports).
- ☐ Reports identify product or service problems.
- ☐ Reports are directed to the person(s) who are responsible for coordinating the investigation and preparing the response.

Comments:

4. Does your organization participate in partnerships/alliances with industry organizations?
   - ☐ Yes
   - ☐ No

   What is the nature of these relationships? For example:

   - ☐ Financial
   - ☐ In-kind contributions
   - ☐ Sharing of expertise
   - ☐ Sharing of facilities (e.g., labs, testing facilities)
   - ☐ Others (please state)

Comments:

5. What kind of quality management mechanisms do you have in place? I am going to read a list please indicate whether each of the following is *(1) very central to your organization's management structure, (2) a part of your organization's management structure, or (3) not in your organization.*

   - ☐ Quality Manager in charge of quality
   - ☐ Quality manuals with written procedures for services provided
   - ☐ ISO 9000 quality management system--a popular method of providing assurance of product quality
   - ☐ ISO/IEC Guide 25 compliance–e.g., to ensure recognition of calibration and test data
   - ☐ Another quality management program/system (please specify)

Comments:

6. Your organization offers a number of services/projects/programs. Could you provide us (e.g., fax, mail, hand out) with a description or list of these services/projects/ programs?

Comments:

7. I am going to list a number of procedures that you may or may not use to track the achievement of goals for your services/projects/programs. Please indicate whether each of the following are *(1) very central to your organization's management structure, (2) a part of your organization's management structure, or (3) not in your organization.*

☐ Frequent reviews to verify whether activities comply with plans.
☐ Frequent reviews of progress to verify that activities are on schedule.
☐ Frequent communication of status on achievement of goals.
☐ Transparent performance feedback mechanisms to staff.

Comments:

8. I would now like to ask you about mechanisms in place to address human resources issues. Again, I am going to read you a list, please indicate whether each of the following are *(1) very central to your organization's management structure, (2) a part of your organization's management structure, or (3) not in your organization*

General human resource development

☐ In-house training
☐ External training
☐ Training on the job
☐ Defined job descriptions for each individual
☐ Defined path for promotion
☐ On-going performance review
☐ Annual or semi-annual performance review
☐ Performance based rewards
☐ Mentoring programs
☐ Human resource advisors
☐ Exchange programs with other similar organizations.

Professional development
☐ Professional libraries
☐ Conferences
☐ Information centres
☐ Other factors

9. I would like to ask you about your marketing strategy. Again, I am going to read you a list, please indicate whether each of the following are *(1) very central to your organization's marketing strategy, (2) a part of your organization's marketing strategy, or (3) not part of your organization's marketing strategy.*

☐ Published information about the organization.
☐ Published information about specific projects/programs.
☐ Published information about your organization's strategic vision.
☐ Website information about the organization.
☐ Website information about specific projects/programs.
☐ Website information about your organization's strategic vision.
☐ Information/Public Affairs office.
☐ Other. Please specify _____
_____

10. I would like to ask about your financial management. Again, I am going to read you a list, please indicate whether each of the following are *(1) very central to your organization's financial planning, (2) a part of your organization's financial planning, or (3) not part of your organization's financial planning.*

☐ Cost monitoring systems
☐ Program/Project budget guidelines.
☐ Program/Project cost reporting system.
☐ Financial officer.
☐ Financial officer assigned to each major project/program.

3. ADDITIONAL INFORMATION

In addition (if not already provided), could you provide the following information to help us better understand your organization's objectives:

☐ Mission, including goals and philosophy of your organization
☐ Long-term objectives
☐ Annual objectives
☐ Functional objectives (e.g., human resources training, significant new equipment purchases, quality management system improvements).
☐ Annual report of org.
☐ Strategic plan report
☐ Organization Chart
☐ Employee statistics (number of staff in organization: professional staff, technical staff, administrative staff, educational attainment of staff)