

Trends in the Quality Assurance of Maritime Education, A Case Study from the Australian Maritime College

Gareth T. COOPER, Barrie LEWARN and Neil J. OTWAY

Australian Maritime College

PO Box 986, Launceston, Tasmania, 7250, Australia.

G.Cooper@amc.edu.au

ABSTRACT

Quality assurance of higher education in Australia, and particularly the conduct of quality audits, is presently undergoing a paradigm shift. Whilst the international maritime industry is largely entrenched in process or compliance-dominated quality audit systems such as ISO and ISM, the higher education sector in Australia and New Zealand is moving towards a less-prescriptive audit system based on quality outcomes as opposed to processes. Similar systems are presently in-place or being considered by Sweden, Hong Kong, Thailand and the USA.

This change in Australia is largely driven by government reforms in the higher education sector and the recognition that prescriptive quality audits may not be consistent with the goals of a “*learning organisation*” such as a university.

The emphasis of outcome-based quality audits is the linkage between the stated strategic objectives of an institution and the way in which the institution deploys resources to achieve these objectives. As a consequence, the need for rigid paper-based processes and workflows can be somewhat negated where the institution can demonstrate a coherent system that produces the desired outcomes in-line with the strategic plan. Critical to outcome-based quality systems is the use of both quantitative and qualitative data, particularly benchmarking, with regards to measuring progress towards targets and establishing best-practice improvement initiatives.

AMC recognises the value of outcome-based quality audits in assuring higher education standards. However AMC also recognises the need to comply with both national and international maritime quality requirements such as ISM code implementation for training vessels. In this regard, AMC is re-designing its quality system to reflect the changing and varied needs of all stakeholders.

With the growing competitiveness of international maritime higher education, it is likely that many IAMU members may soon experience a similar crossroad in quality assurance with a need to re-think approaches to quality to satisfy all stakeholders. To facilitate this eventuality, AMC advocates the establishment of a network of IAMU benchmarking and planning working parties, with the aim to promote international benchmarking and best-practice in quality assurance. AMC is in a unique position to share its learnings and contribute to such a process.

1. Introduction

The Australian Maritime College (AMC) is the only institution in Australia which specialises in maritime and marine-related studies, offering Vocational Education and Training (VET) as well as Higher Education (HE) courses including postgraduate courses at masters and doctoral level. This dual aspect of AMC's operation places a unique emphasis on AMC's quality and improvement systems in that there is a need to tailor improvement initiatives to meet the requirements of both VET and HE stakeholders.

In 2000, AMC began to develop a strategy to grow the organisation's HE component to maintain international competitiveness in an environment of aggressive marketing of maritime education. Consequently, the goals and objectives of the AMC Strategic Plan now reflect a major change in emphasis towards the development of a "university" culture, whilst maintaining its highly regarded vocational training component. Intrinsic to this strategy is the need for AMC to further foster values found in other universities, namely:-

- ◆ The development of a "*learning organisation*" which encourages collaboration and scholarship
- ◆ The encouragement of a "research culture" with a world-leading reputation
- ◆ The pursuit of excellence in teaching and learning
- ◆ A willingness to undertake new challenges and develop international opportunities
- ◆ The encouragement of scholarly debate and community interaction
- ◆ The need to be innovative and to develop meaningful links with private industry

In 1999 the Australian Government established the Australian Universities Quality Agency (AUQA) as part of its reforms to the HE sector. AUQA utilises an "outcome-based" audit system to assess all tertiary education institutions in Australia with the results being published in the national press and on the internet. This system is based on that implemented by the New Zealand government, which in turn is based on the original system implemented in the United Kingdom some 15 years ago. The advent of AUQA, and its high public profile, has had a profound effect on university quality systems throughout Australia. Many universities are either developing or re-developing their quality systems in accord with the expectations of AUQA and it would be true to say that many institutions are experiencing a rapid quality revolution driven by these expectations. Strategically, AMC needs to both compete with other universities as well as conform with the expectations of AUQA.

In October 2002, AMC was one of the first institutions in Australia to be subject to an audit by AUQA. Apart from a number of excellent results, the audit process highlighted a number of issues with the existing AMC quality system, namely; how can a dual sector institution (both vocational and higher education) develop a single “whole-of-institution” quality system which meets the needs of both “outcome-based” auditing and “compliance” auditing?. AMC has subsequently embarked on the development of a new and unique quality system which will address this issue.

2. Outcome Versus Compliance Based Quality Systems

Most industries, including maritime industries, have traditionally relied on compliance-based quality systems such as ISO and ISM. This is to be expected given the process dependence of these industries as well as the safety implications associated with non-compliance. However, compliance to procedural systems may not necessarily result in a quality outcome.

AMC’s quality improvement strategies have previously been focused on the need to comply with external auditors. Many of AMC’s courses have practical applications which lend themselves to procedural quality systems as used by many external approving bodies such as the Australian Maritime Safety Authority (AMSA). Consequently, until recently, AMC has pursued a quality system based on compliance-oriented auditing such as ISO 9000:1994. These systems, in one form or another, are commonly found in industrial environments where they ideally suit the processes of large commodity manufacturers and where the output is “widgets per hour”. Although significantly modified under ISO 9000:2000, compliance-based quality systems are largely designed to identify “process failures” more than assessing whether or not the final outcome is consistent with the strategic goals of the organisation.

There are parts of AMC for which such formulaic quality systems are beneficial (eg. ISM implementation for training vessels and student record keeping etc). However, on a broader scale, it is now widely recognised that such approaches are also highly prescriptive and inappropriate for a “*learning organisation*” where the outputs are less tangible products such as “student attributes” and “learning experience”. Both compliance and outcome-based quality systems have many operational characteristics which are similar, but they are distinctly different in approach (Table 1).

In contrast, the outcome-based approach of AUQA avoids auditing the fine-detail of processes, as found in the ISO models, and concentrates more on the outcomes. Central to the AUQA model is the need for “self-review” and the auditing of quality approaches with respect to their alignment with the organisation’s strategic aims (Anderson et al., 2000).

Table 1: Some characteristics of process-oriented versus outcome-oriented quality systems

| Compliance-oriented quality system Eg. ISO 9000:1994 | Outcome-oriented quality system Eg. the AUQA approach |
|---|--|
| Formalised and procedural (checklist) | Generally low formality |
| Compliance-based (looks for process failures) | Self-Review (looks at outcomes) |
| Structured responsibilities | Devolved responsibilities |
| Use of PDCA Cycle (Plan, Do, Act, Check) | Use of ADRI Cycle (Approach, Deployment, Results, Improvement) |
| Focus on quality of procedure (procedural consistency) | Focus on methods of improvement |
| Use of KPI's to identify process failures | Use of KPI's to demonstrate outcomes and plan for the future |
| KPI's measure present-day processes | KPI's linked to strategic approach (objectives) |

3. International Trends in Higher Education – The Growth of Outcome Based Quality Systems in Education

Higher education (HE) has experienced a number of trends in recent years (Table 2). Of greatest significance to the maritime sector is the growing globalisation of education. This is reflected in the fact that many maritime education institutions, including AMC, actively compete for students and staff beyond their national borders. This may be achieved in a number of ways including recruiting students and staff to the home campus, by establishing international campuses or forming strategic teaching alliances with international partners. The net effect of this trend is that maritime students are increasingly more mobile in what has always been a very mobile industry.

A consequence of increased globalisation is the recognised need to assure the quality of education beyond national borders, or the mutual recognition of quality standards. How can a Swedish shipping company be assured that an AMC graduate in transport logistics has had the same standard of education as a local graduate?

Table 2: Trends in Higher Education (HE)

| Trend | Description |
|-----------------|---|
| Massification | increasing numbers of students from varied backgrounds and locations |
| Privatisation | the growth of private HE providers and the decline of public funding for HE |
| Diversification | growth of HE offerings beyond the traditional realms of universities |
| Globalisation | growth of HE beyond national borders and the increased mobility of students and graduates. This is of importance with regards to the development of international standards and the assurance of education quality beyond borders |
| Development | growing recognition of the importance of education in both personal and national development |
| Commodification | Increasing trend to consider education, and its component parts, as a commodity which can be traded. |
| Quality | growing recognition of the need for effective quality assurance |

Most nations now have some form of External Quality Agency (EQA), usually established by the national government for the purpose of assuring the quality of education. AUQA is the EQA established by the Australian government in 1999. AUQA utilises an outcome-oriented audit system based on that used in New Zealand. Likewise the New Zealand system was based on that used in the UK. Each EQA utilises different audit techniques but there is now a growing trend towards international mutual recognition of EQAs (Woodhouse, 2003).

UNESCO has done some work in the mutual recognition of qualifications such as architecture, but the greatest amount of work has been done by the International Network for Quality Assurance Agencies in Higher Education (INQAAHE). This body established a number of working groups in 2000 to develop mutual recognition of EQA's and in 2003 endorsed a set of "Principles of Good Practice for EQAs". INQAAHE, in conjunction with the International Association of University Presidents (IAUP) has also been assessing the need for a global system for the accreditation of EQAs. However, it is more likely that individual EQAs will instead commit themselves to the INQAAHE Principles and opt to have themselves independently reviewed against these Principles (Woodhouse, 2003).

The net outcome from this activity is likely to be greater international standardisation in auditing techniques used by EQAs and, most probably, the international growth of outcome-based auditing in higher education as opposed to compliance based auditing. The consequence of this for IAMU members is that they may find themselves at the same quality cross-road that AMC presently faces. As providers of both higher and vocational education in the maritime sector, IAMU members will need to satisfy the quality requirements of both industry stakeholders and their respective EQAs.

4. The Planning-Quality-Information Nexus

Outcome-based quality systems are dependent on the degree of alignment between quality improvement initiatives and the strategic direction of the organisation, as stated in its strategic plan. In Australia, AUQA audits an educational institution by assessing whether or not its outcomes are consistent with its strategic plan and whether or not the outcome was planned. Consequently, the strategic plan, the planning process and how activities support the plan are critical components for all Australian universities.

All quality initiatives undertaken at AMC must be consistent with the strategic direction of the organisation. Likewise the nature of the quality system itself should be such that it enables the organisation to meet its goals. The establishment of a strategic direction is dependent upon the information (data) available for decision making and these same data will be used to monitor and validate the effectiveness of the quality system. Consequently, quality, planning and information (data) are intrinsically linked (Fig. 1).

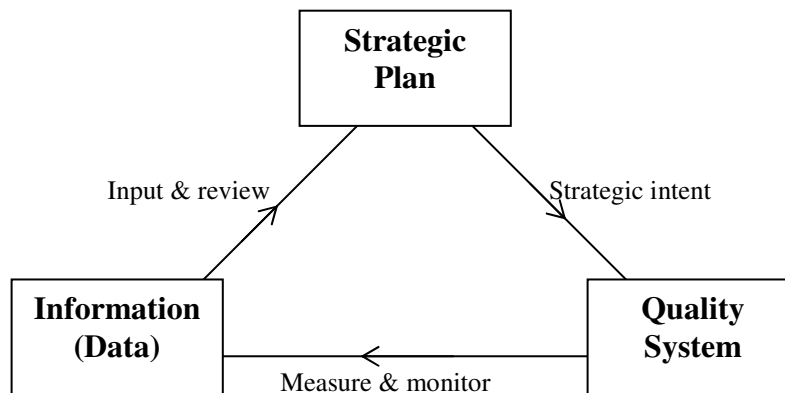


Figure 1: The AMC planning-quality-information nexus.

In line with the present redevelopment of the quality system, AMC embarked on the generation of a new Strategic Plan in 2003. The new AMC Strategic Plan is presently being developed after a series of detailed internal and external reviews, audits, stakeholder surveys and staff consultations in which over 40% of all AMC staff contributed. The new AMC Strategic Plan will set the direction of the organisation from January 2004 and will guide all subsidiary strategic and operational plans. The strategic planning process has covered the following areas and it is anticipated that these areas will be further defined by subsidiary strategic plans:-

- ◆ Teaching and Learning
- ◆ Research
- ◆ Finance and Administration
- ◆ Community and International Development.

The assessment of a plan's effectiveness will be based on the routine monitoring and auditing of Key Performance Indicators (KPIs) and other measures to ascertain progress towards targets. Information will be routinely reported to the Senior Management Team (SMT) as well as the governing body of AMC (the AMC Council). In this way, the use of information (data) and the benchmarking of data will be crucial to the attainment of strategic goals.

5. Approaches to quality and improvement at AMC

5.1 Introduction to the New AMC Quality System

Traditionally, quality systems have concentrated on quality control or assurance, that is ensuring that the final product meets specifications. AMC recognises that assurance is important but also recognises the need to exceed expectations and to seek improvement beyond requirements. AMC is therefore building a system that promotes planned continuous improvement enacted by small teams throughout the organisation.

Associated with the use of continuous improvement techniques is the need to demonstrate that improvement has occurred. In the conduct of an audit, AUQA will expect a university to demonstrate that a) improvement has occurred and b) improvement is the result of a planned activity or deliberate strategy and not simply a matter of good fortune. Consequently, AMC has established a set of KPIs and other internal and external measures and will link these with both strategic goals and continuous improvement projects to demonstrate that improvement has occurred. Critical to this concept is the practice of benchmarking (Lewarn, 2000).

5.2 Self-Review

In June 2002, AMC conducted an institutional self-review in preparation for the AUQA Audit. A self-review, like a medical examination, is an excellent tool for an organisation to frankly assess its strengths and weaknesses. The AUQA methodology advocates the use of self-review prior to audit and this is now well accepted as a valuable quality process (Thune, 1996). AMC has subsequently developed an internal self-review template with the expectation that all internal audits will be based on an assessment or validation of the preceding self-review.

5.3 The Continuous Improvement Cycle (ADRI)

AMC advocates the use of the ADRI Cycle in quality improvement initiatives and planning. The cyclical nature of continuous improvement, more commonly referred to as the "Quality Cycle", is well established and dominates most quality systems. Compliance-oriented quality systems more frequently refer to this as the Plan-Do-Check-Act cycle (Deming, 1986) as is utilised in ISO 9000:2000.

The ADRI cycle concentrates on improvement initiatives as well as the links between the specific stages of the ADRI cycle. This is particularly useful for educational institutions where it is important to align the “Approach” or objectives, with the improvement outcome. The ADRI cycle should prompt users to ask the following basic questions:

- ◆ What are the objectives of the organisation, what is the organisation trying to achieve ?
- ◆ What is the best way in which to achieve this objective?
- ◆ What are the results for the stated objective?
- ◆ How is the organisation going to improve based on these results?

The “Approach” addresses how goals are to be achieved. It ensures that objectives are linked to appropriate key performance indicators and benchmarks. These goals should also be communicated through the organisation. The “Deployment” addresses how the approach is to be put into action. It ensures that processes are managed and staff are trained and resources are available to fulfill the approach.

The “Results” stage assess how well the deployment is being achieved. Typically this may take the form of reviewing KPIs and undertaking benchmarking exercises with regards to the stated objectives. Finally, the “Improvement” stage identifies strategies and mechanisms put in place to implement improvements based on the previous ADRI stages. This also includes systems for measuring and monitoring process measures to ensure that improvements are occurring.

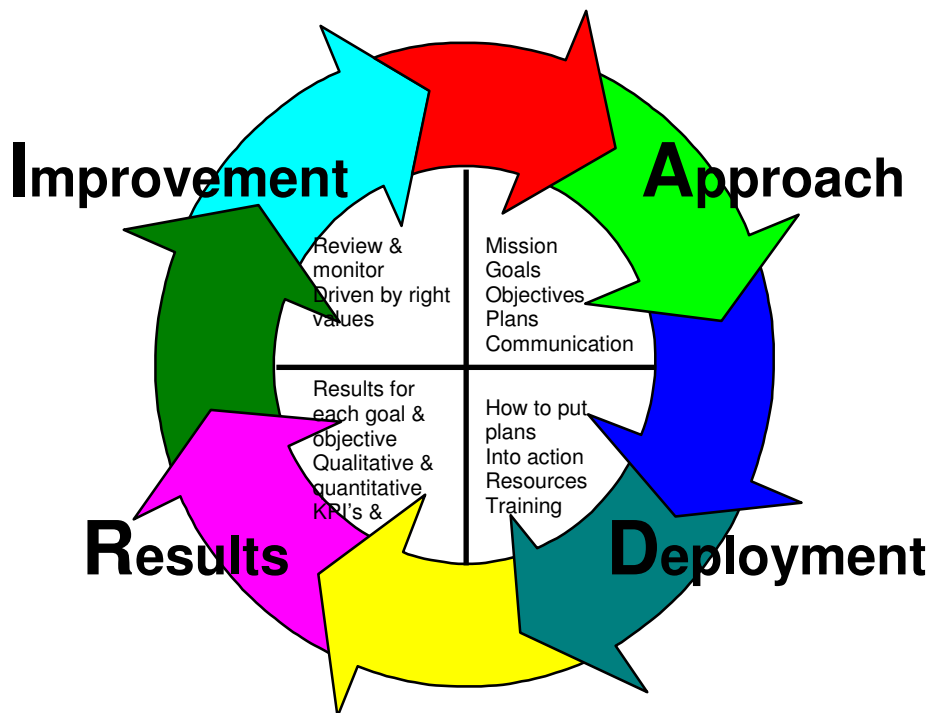


Figure 2: The ADRI Cycle

5.4 Data-Based Decision Making (Measurement Systems)

Quality improvement must be demonstrable. The corner-stone of outcome-based quality systems is the ability of an institution to demonstrate it has achieved quality outcomes and that these outcomes are linked to a deliberate approach using a continuous improvement cycle (Woodhouse, 2002).

AMC uses both quantitative and qualitative data to allow improvement initiatives to be devised, monitored and delivered. The ADRI cycle, like most quality cycles, is dependent upon the use of data to both define quality issues and to measure the resultant improvement from any implemented initiatives. Data are crucial in defining a “base-line” from which improvement can be measured. These data will commonly be in the form of established KPIs, although AMC encourages the application of a wide variety of data which may be relevant to the organisation’s objectives.

Data should be plotted along time-dependent axes to show temporal changes. Likewise the use of multiple measures or “scorecarding” is also encouraged to provide a cross-reference to ensure that “success” is being correctly measured. Of interest is the fact that the use of education sector data in this way has many similarities with Statistical Process Control (SPC) methods that may be found in a typical manufacturing environment (eg. Rath and Strong, 2000).

However, it should be remembered that many simple improvement initiatives do not require detailed data, or may rely on basic qualitative data. This may include the use of customer (student) feedback, focus groups or simple survey forms. These initiatives are often very effective and can have a significant impact on the quality of outcomes.

5.5 Benchmarking

Related to the use of measurable data is the external comparison of these data with like institutions (benchmarking). Externality, or the use of external reference points, is an important component of any outcome-based quality system. Benchmarking enables participating institutions to identify “good practice” and thereby learn, by comparison, new ways to improve their operations.

The key considerations in benchmarking are:-

- 1) Benchmark data must be derived from a universal or like source or agreed methodology. This is to avoid inappropriate comparisons; that is, “comparing apples with pears”.
- 2) Benchmark data should be compared for like institutions; that is, institutions which are similar in student/staff size, offerings, research interests, infrastructure or culture.

AMC places great value on the benchmarking of KPIs and other measures. However given the unique nature and size of AMC, it is often difficult to find suitable benchmarking partners in Australia. AMC presently benchmarks itself against Australian universities which are either small, dual-sector or new. To this end, data published annually by the Federal Department of Education, Science and Training (DEST) is now used by many universities throughout Australia for the purpose of benchmarking studies. AMC presently benchmarks itself, using DEST data, with Ballarat University, Swinburne University, Victoria University of Technology, University of Southern Queensland and the Northern Territory University.

The Australian Federal Government through the Graduate Careers Council of Australia (GCCA) conducts a number of student surveys for all institutions every year to ascertain the value of student learning experience. An example of this is the Course Experience Questionnaire (CEQ) which is used to derive benchmark data for measures such as “Good Teaching Standards” and “Overall Satisfaction” with learning experiences. These surveys are conducted independently of the institution and use common questions so that the resultant data are useful for benchmarking. An example is shown in figure 3 using data from the CEQ.

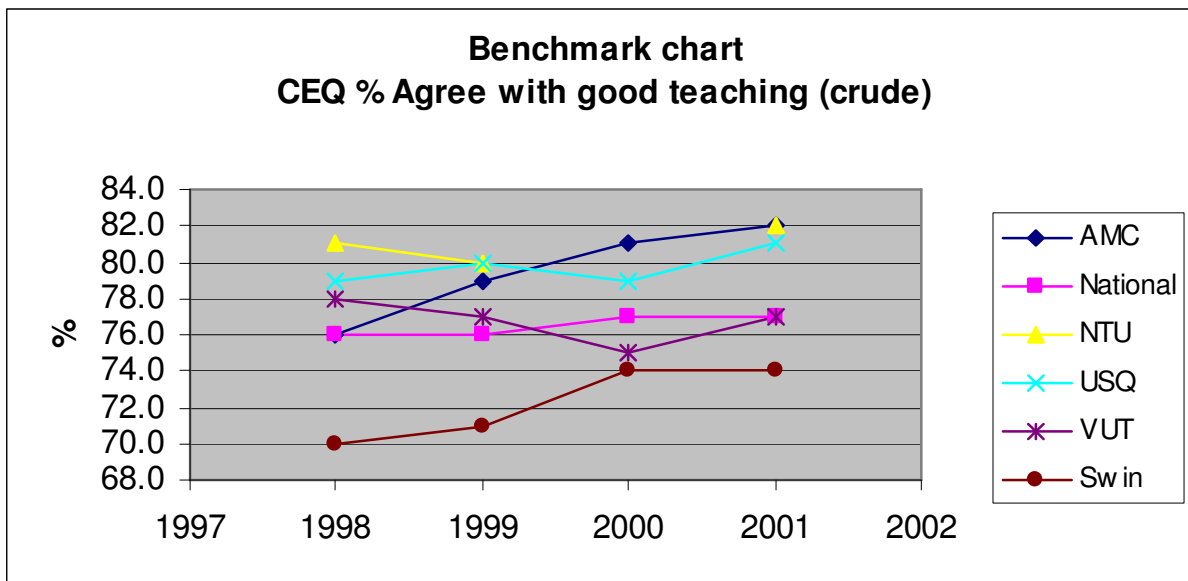


Figure 3: Data from the national Course Experience Questionnaire (CEQ) representing responses for the percentage of students whom agree that teaching practices are good. Note that these data are plotted against time and show a trend of gradual improvement for AMC. The data are also benchmarked against other institutions and show that AMC has performed well in comparison.

6. Auditing for Outcome and Compliance-Based Requirements

6.1 Dual-Sector Education, the Need for Quality Integration

Where quality systems are viewed as a spectrum, AMC has traditionally been entrenched at the compliance end of the spectrum with an emphasis on ISO systems (Fig. 4). In the HE sector, the success of compliance-based systems has been limited and the suitability of these systems to AMC's changing needs is doubtful. It is clear that, in their present form, compliance-based systems are incongruous with many scholarship, teaching and research aspects found in a "learning organisation". This has also been noted in the New Zealand experience (Meade, 1995) and has been described in the case of Victoria University of Technology (Barkley and Jeffries, 2003).

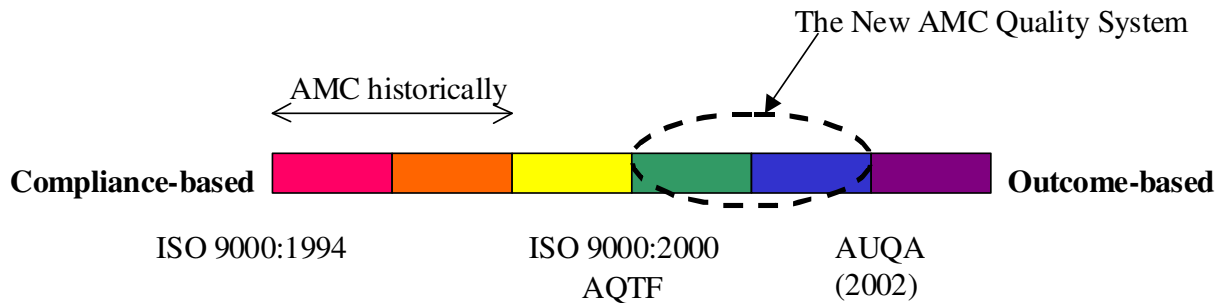


Figure 4: The quality system spectrum showing AMC's traditional links with compliance based systems and the strategic need to move towards the outcome-based end of the spectrum.

In 1995 the Australian National Training Authority established the Australian Quality Training Framework (AQTF). The AQTF comprises 12 nationally recognised audit standards which all VET sector providers must satisfy every year. AMC has modified these standards for auditing purposes and a description of the areas encompassed by the standards can be found in Table 3. AMC was subject to an external audit against the AQTF standards in April 2003 and passed the audit without any non-conformances. The AQTF standards are somewhat more flexible than the highly process-oriented methods of ISO 9000:1994 but they are also a more rigorous formula than the AUQA approach. AMC considers the 12 AQTF Standards to be highly attractive as a universal system of auditing as they are:-

- 1) Nationally recognised in Australia
- 2) Compliance oriented to suit vocational sector requirements
- 3) Easily modified to encompass outcome-based auditing (HE sector requirements)

Table 3: The AMC Audit Standards as modified from the AQTF Standards

| AMC Audit Standard No (Standards 1-12 AQTF based) | AMC Audit Standard Name |
|--|--|
| AMC Audit Standard 1 | Systems for quality training & assessment (Vocational) and teaching & learning (Higher Education). |
| AMC Audit Standard 2 | Compliance with Federal and State legislation and regulatory requirements. |
| AMC Audit Standard 3 | Effective financial management procedures. |
| AMC Audit Standard 4 | Effective administrative and records management procedures. |
| AMC Audit Standard 5 | Recognition of qualifications issued by other Universities. |
| AMC Audit Standard 6 | Access and equity and client service. |
| AMC Audit Standard 7 | The competence of staff |
| AMC Audit Standard 8 | Assessments & examination. |
| AMC Audit Standard 9 | Teaching, learning, assessment & flexible delivery |
| AMC Audit Standard 10 | Issuing of qualifications and statements of attainment |
| AMC Audit Standard 11 | Use of National and State logos |
| AMC Audit Standard 12 | Ethical marketing and advertising |
| AMC Audit Standard 13 | Governance, planning & benchmarking. |
| AMC Audit Standard 14 | Research, ethics, scholarship & community |

AMC recognises the value of its vocational sector and the need to satisfy the requirements of vocational stakeholders. In this regard, AMC sees compliance with the 12 AQTF standards as an excellent approach to assuring quality in this area. AMC also recognises many similarities between the AQTF standards and the principles of outcome-oriented systems such as that used by AUQA for the HE sector. Consequently, AMC is developing a system that will internally audit all areas of the organisation using a suitably adapted template which combines the need to quality assure both HE and vocational sector interests. However regardless of the different requirements for the HE and vocational sectors, it is essential that AMC's approach to quality is aligned with the goals stated in the AMC Strategic Plan.

6.2 The AMC Audit System

The integrated approach to auditing developed by AMC is designed to cater for both outcome-based stakeholders such as AUQA and compliance based stakeholders who recognise the AQTF standards. To facilitate this, AMC has developed an audit template based on both the 12 AQTF Standards and the AUQA Audit Manual (Table 4). Auditing by trained in-house AMC auditors will mainly assess the outcomes of the department being audited in the same way that AUQA conducts its audits.

Whilst processes are important and may also be audited, the auditors will also look beyond simple compliance and seek to establish if the department can demonstrate the quality of its outcomes. Typically this may be in the form of questions related to establishing a greater understanding of quality issues or seeking benchmarked measures used by the department (Table 4). In this way, both the need for compliance against AQTF standards is addressed for the VET sector plus the need for the demonstration of quality outcomes is also addressed for VET and HE sectors. Compliance-based systems are often criticised for encouraging a simplistic “tick-in-the-box” attitude without seeking to validate the quality of the outcome or the strategic understanding of the process. The AMC audit system is designed to achieve the “tick-in-the-box” and then to seek a deeper understanding of quality issues. Auditors will seek to establish:-

- a) The level of understanding displayed by department members of general policies and procedures.
- b) The degree of application of general policies and procedures
- c) Data demonstrating the quality of outcomes.

Table 4 – Example of questions used for both HE and VET sector audits

| Std No. | AMC Audit Standard | Possible questions or evidence sought during audit |
|----------------|--|---|
| 2.1 | AMC must identify and comply with relevant State or Territory laws including Commonwealth or State/Territory legislation on: i) occupational health and safety; ii) workplace harassment, victimisation and bullying | <ol style="list-style-type: none"> 1. What is your understanding of AMC’s policies on OH&S and workplace harassment? 2. Where would you find a copy of these policies? 3. The audit panel may seek evidence relating to how widely known these policies are amongst staff in the unit. 4. The audit panel may seek evidence from a recent OH&S case within the unit to ensure that the policy was correctly administered. |
| 13.2 | AMC must have a strategic plan which clearly demonstrates linkages between goals, strategies, performance measures and accountabilities. | <ol style="list-style-type: none"> 1. What is AMC’s Mission and Vision as stated in the AMC Strategic Plan? 2. How is your unit fulfilling the goals of the AMC Strategic Plan? 3. The audit panel may ask to see KPI’s and other performance measures about the unit which are relevant to the AMC Strategic Plan. |

7. Discussion – a Network for International Benchmarking in Maritime Education

Global quality assurance in education will become increasingly dependent on the mutual recognition of “good practice”. International benchmarking is therefore the key to identifying good practices that will allow IAMU member to substantially enhance their own quality systems. AMC proposes the establishment of a working party, to define the requirements for, and establishment of, an International Network for Maritime Education Benchmarking (INMEB). Such a proposal may follow the draft procedure described in figure five.

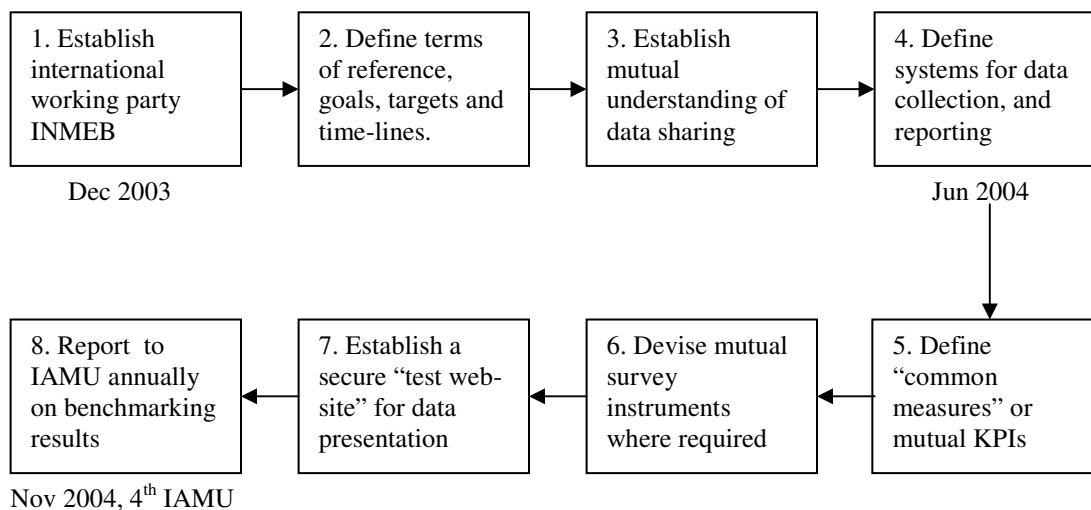


Figure 5: Simplified draft procedure for the establishment of an International Network for Maritime Education Benchmarking (INMEB).

Interested IAMU members are encouraged to participate in the proposed INMEB which will ultimately be a forum for the international exchange of ideas on quality assurance in maritime education. The working group will be required to establish a system of “common measures” or standardised KPIs that can be readily compared amongst participating institutions. Such measures would be mutually agreed, defined and understood so as to avoid issues associated with “commercial-in-confidence” data.

The working group will also need to define systems for data collection (eg. survey instruments) as well as reporting of collated data. This may ultimately be achieved via a secured web site which will allow participating institutions to both post data for common measures and monitor the progress of their institution. The working party will be required to meet on a regular basis to establish these systems and ultimately to discuss areas or good-practice identified from the benchmarking process. It is anticipated that a progress report for the working party should be available for the 4th Annual IAMU Conference to be hosted by AMC in Australia in November 2004.

However, the ability of the working party to effectively establish a framework for international benchmarking, will be dependent on resources. To this end, AMC advocates that the IAMU gives consideration to providing funding and support to this undertaking. AMC considers that the proposed INMEB will be a valuable learning experience for all IAMU members. Given AMC's recent experiences in benchmarking and outcome-based auditing, AMC is in a unique position to offer advice and guidance in this process.

8. Conclusions

Globalisation of education and the international nature of the maritime industry will ultimately result in the need for maritime universities across the world to address the issue of effective quality assurance beyond national boundaries and the need for mutual recognition of quality standards. This will be strongly influenced by both the need to comply with the standards of industry stakeholders and the requirements of each nation's EQA. The growing mutual recognition of EQAs, especially driven by the INQAAHE Principles, and the growing use of outcome-oriented quality systems for HE, suggests that many IAMU members may soon experience the same quality paradigm shift currently facing AMC.

AMC believes it is possible to cater for the varied requirements of its VET sector stakeholders and HE stakeholders through a single whole-of-institution outcome-oriented quality system based on the AQTF Standards. This system must be strongly aligned to the organisation's strategic plan and use data as a means to demonstrate quality improvement.

A critical component of outcome-oriented quality systems is the need to benchmark data, particularly with international institutions. As a means of establishing good practice in maritime education, AMC advocates the establishment of IAMU working parties on benchmarking. These working parties should address benchmarking issues such as the establishment and definition of KPIs and other measures, the design and implementation of common survey instruments and requirements for plotting and presenting benchmark data. AMC believes that significant gains in quality can be achieved by those institutions which choose to participate in such a collaborative venture.

REFERENCES

- 1- Anderson, D.J., Johnson, R, Milligan, B. (2000). Quality assurance and accreditation in Australian Higher Education: An assessment of Australian and International practice. Centre for Continuing Education, The Australian National University.
- 2- Barkley, M. and Jeffries, A. (2003): Working with, across and beyond the divide: quality in dual sector universities. *Proceedings of the Second Annual Australian Universities Quality Forum*, Melbourne.
- 3- Deming, W. (1986). *Out of Crisis*. Cambridge, MA: MIT Press.
- 4- Lewarn, B. (2000). Benchmarking – its applicability to MET. *IAMU Journal* 1(1), 28-33.
- 5- Meade, P. H. (1995). Utilising the University as a Learning Organisation to Facilitate quality improvement. *Quality in Higher Education* 1(2), 111-121.
- 6- Rath and Strong (2000) *Six Sigma*. Rath & Strong Management Consultants, Massachusetts, USA, pp191.
- 7- Thune, C. (1996). The Alliance of Accountability and Improvement: the Danish experience. *Quality in Higher Education* 2(1), 21-32.
- 8- Woodhouse, D. (2002): Quality: where's the evidence? *Australian Association of Institutional Research Proceedings*. Perth: AAIR.
- 9- Woodhouse, D. (2003): Mutual Recognition of Quality Assurance Agencies. *Proceedings of the Second Annual Australian Universities Quality Forum*, Melbourne.