

## EDUCATING AND TRAINING FOR QUALITY IN NEW ZEALAND

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Quality Assurance in New Zealand has undergone a rapid development over the past three decades. Much of this development has focused around the provision of education and training.

This paper traces the development of Quality Assurance Education in New Zealand and describes current courses.

### **Introduction**

In the early 1960s most quality practitioners in New Zealand were involved in inspection based quality control and apart from their technical backgrounds in engineering or science had little or no formal training in the quality disciplines. What knowledge they did have had usually been obtained informally through experience or by reading overseas publications. A few were fortunate enough to have worked in Europe or North America where they had acquired some formal training in quality, usually in Statistical Quality Control.

### **A Voice in the Wilderness: 1960 - 1975**

Before 1960, there was no specific education for quality in New Zealand.

The two engineering schools at what were then Auckland University College and Canterbury University College did include, within other subjects, some teaching in metrology, inspection and control techniques that might conceivably have formed part of a curriculum in Quality Control, but the focus of these courses was elsewhere and they could not reasonably be considered courses in Quality Control.

Similarly, the Technical Institutes covered measurement and inspection related topics in some technical courses but again it could not be said that Quality was accorded recognition in its own right.

There was no professional body to promote Quality Assurance and existing professional bodies such as IPENZ and NZIM who might reasonably have been expected to take an interest in the discipline showed no inclination to do so.

In 1960 Massey Agricultural College (now Massey University) introduced a new four year degree: the Bachelor of Food Technology under the direction of Professor J.K. (Kelvin) Scott. Over the next 33 years the faculty developed into the now Faculty of Technology with ten

degree options covering the whole spectrum of New Zealand industry.

From the beginning, Quality was given a higher prominence than it had ever previously been accorded in New Zealand education. The quality teaching was expanded as changes in New Zealand export markets created a need for diversification and higher standards of quality.

Rather than follow these market developments, Massey tried to lead them, expanding its curriculum before manufacturers had fully grasped the need.

Currently Massey degrees in Technology still offer the most comprehensive training in the Quality disciplines found in any university in New Zealand.

In all, over 2500 students have graduated in the various Bachelor of Technology options since 1960 offering their employers technical and leadership skills in Quality Assurance previously unavailable in New Zealand.

#### **Gathering the Disciples: 1975 - 1979**

In 1974, Professor Scott, who was then Chairman of the Manufacturing and Processing Committee of the National Research Advisory Council (NRAC) attempted to interest government to promoting quality on a wider front.

Some progress was made with the creation within the Auckland Industries Development Division (AIDD of DSIR of a position for an officer to advise industry on quality related matters. In January 1975, Mr A R (Tony) Stephenson was appointed to this position.

At its February 1975 meeting, Professor

Scott's committee set up a working party on Quality Control. In reporting back this working party found a "...lack of training in Quality Control either 'in house' or on formal courses" and suggested as an objective, "The provision of education and training opportunities for management and supervision in the concept and practice of quality control...". Unfortunately, while the report gained strong support from the then Minister of Science and Technology, he was unable to persuade Cabinet to act on it.

Attention then shifted to the establishment of a professional body to promote quality. In 1974 Mr Martin Devlin, a lecturer in Professor Scott's department had tried unsuccessfully to interest IPENZ in fostering such an organisation. In 1975 Professor Scott suggested to his staff that their 1976 annual conference for industry should include a meeting to discuss the establishment of a professional quality body.

Hence on 26, May 1976, this meeting set up a Steering Committee chaired by Mr Tony Stephenson to investigate the need for a professional body and ascertain the form it might take. Secretarial support was provided by Massey University. The Steering Committee reported back to the 1977 Massey Conference and on the 23, May 1977, the New Zealand Organisation for Quality Assurance was founded with Tony Stephenson as its first president.

From the beginning there was plenty of evidence of a strong demand for education in Quality. A travelling seminar called "Profit from Quality" was run during 1976 and 1977. At the first presentation in May 1976 just a few days before the founding of NZOQA, a survey of seminar participants showed

overwhelming support for the programme.

Hence from its very beginnings NZOQA was committed to making Quality Education the central plank of its activities.

A second survey of manufacturers conducted in June 1976 identified the predominant need for training as:

- 1) Inspection techniques especially in relation to engineering measurement, reading of drawings and interpretation of specifications.
- 2) Purchasing specification and inwards goods inspection.
- 3) Statistical quality control.

Other topics requested were Quality Costs, Management and Organisation of Quality, Quality of Design, Analysis of field Service Data and Motivation. These two surveys influenced the content of the many short courses and seminars that appeared from 1976 to 1978. However, course organisers recognised that despite a lack of request for it, Quality Assurance Systems and Management would need to be injected into these seminars if real progress was to be made.

Ways were sought to spread the Quality Assurance message to all members especially those who did not live in the three main population centres where most divisional meetings were held. Two obvious ways to achieve this were a regular publication and an annual conference.

Early in 1978 an ambitious, glossy quarterly Journal called "Quality

Assurance" was launched and six issues were produced before it became too costly to support in mid-1979. The current biannual journal "Quality Assurance New Zealand" was launched in November 1981 with substantial financial and technical assistance from the Science and Information Division of DSIR and eventually taken over completely by NZOQA in May 1986.

In May 1979 a joint conference "Quo Vadis '79" was held in Auckland by NZOQ and the New Zealand Institute of Food Science and Technology (NZIFST) an organisation which also has the distinction of having been founded and nurtured by Professor Scott and Massey University.

As well as the local divisional efforts at quality training, usually by way of invited speakers, short workshops and factory visits a number of other quality seminars were run by various organisations.

The Productivity Centre of the Department of Trade and Industry was actively promoting Quality Assurance. With sponsorship from Alex Harvey Industries Ltd they produced an audio-visual presentation on Quality Control and later published a small booklet dealing with the Basic Concepts of Quality.

Auckland Technical Institute was also active in offering short courses in Quality Assurance.

In 1978, NZIFST approached Mr Malcolm Reeves of the Food Technology Department at Massey University with the proposal that they assist in funding him to travel to North America with the objective of investigating university level training in Quality Assurance. This was to be

preparatory work towards Massey developing a post graduate, post experience, extramural qualification in Food Quality Assurance. This resulted in the launching of the Diploma in Food Quality Assurance in 1980.

### **Spreading the Gospel: 1980 - 1991**

By 1980 there was a strong realisation that a much more orderly and structured approach to education and training was required.

Following the success of the joint conference with NZIFST in 1979, NZOQA held its first stand-alone conference in Christchurch in 1980. Since then it has held an annual conference every May and in March 1991, hosted New Zealand's first International Quality conference, the third Asia Pacific Quality Control Organisation Conference in Auckland.

At the 1979 conference two papers which focused on the education needs of the Quality Profession resulted in some new initiatives in quality education.

Mr Gordon Smith, then at Christchurch Polytechnic examined the need for sub-university level courses using as examples the American Society for Quality Control (ASQC) programmes for Certified Quality Engineer (CQE) and Certified Quality Technician (CQT). He suggested that NZOQA should work with the polytechnics to develop such courses and that negotiations should be entered into with ASQC to offer the CQT examination in New Zealand.

Mr Malcolm Reeves described the new Diploma in Food Quality Assurance and closed with the remark that "It might be possible in the future to develop a more general Diploma in Quality Assurance for manufacturing industries along the

lines followed in the development of the Diploma in Food Quality Assurance".

NZOQA was quick to take up the challenge and initiated discussions with Massey University. At the National Council Meeting of 11, September 1980, resolutions were passed to support the Diploma in Food Quality Assurance and request the IME Department at Massey to jointly develop a Diploma in Q.A.

Proposals for a course to be developed by Christchurch Polytechnic were also approved but this development was abandoned when Gordon Smith left Christchurch Polytechnic to take up an appointment at Massey.

Meanwhile, within the Polytechnic rapid developments were taking place led by NZOQA's Education Committee.

By 1981, Auckland Technical Institute had developed a two-hour per week, ten week evening class in basic Quality Assurance with help from local NZOQA members. This was repeated in 1982. That year was Petone Technical Institute offer two separate evening courses of similar duration with course design and tutoring from local NZOQA members Derek Wheeler (Introduction to Quality Assurance) and Tim Ball (Introduction to Statistics for Quality Assurance).

The demand for both the ATI and PTI classes was so strong that in November 1982, National Council resolved that the courses should form the basis of a national course as preparation towards the CQT examination, as by this stage NZOQA had entered into an affiliation agreement with ASQC that enabled the CQT examination to be offered.

During 1983 the Introduction to Quality Assurance course was run in various forms at Auckland Technical Institute, Petone Technical Institute and Christchurch Polytechnic.

PTI also continued to run the Introduction to Statistics course and ATI developed a new course Metrology and Drawing Interpretation.

1984 saw a more uniform version of Introduction to Quality Assurance expanded further to include Waikato Technical Institute and Manawatu Polytechnic. In addition new courses were being trialed to cater for those who had completed earlier courses. These included:

Drawing Interpretation for quality assurance (PTI).

Introduction to Quality Circles (PTI).

The Introduction to Statistics for Quality Assurance course was again run at PTI and in revamped measurement course was offered at ATI.

At the end of 1984, nine students sat the ASQC CQT examination with six obtaining a pass. Unfortunately, this start to formal qualifications was marred by appalling communications with ASQC.

The proliferation of new higher level courses in different institutions was both a cause of satisfaction and alarm. In order to bring some uniformity to it, NZOQA resolved to set up a uniform course structure for polytechnic courses. This resulted in a complete rewrite of all courses to create a revamped Introduction to Quality Assurance and three higher level courses:

- 101 Quality Concepts and Reliability.
- 102 Statistics for Quality Assurance.
- 103 Measurement and Calibration.

These courses were offered in Auckland, Wellington, Christchurch and Hamilton, while the Introduction to Quality Assurance course was also offered in Palmerston North.

Due to the difficulties experienced with the CQT examination it was decided to implement a New Zealand based Quality Technicians Certificate examination at the end of 1985. Despite the short lead time, an examination of targeted at a slightly higher level than CQT was sat by 40 students of whom 36 received passing grades. Hence the Certificate in Quality Assurance was born.

In 1989 a major rewrite of the CQA notes was carried out. Since then there have been several minor updates and a complete rewrite is planned for 1994.

To date, over 1000 candidates have successfully completed the course making it the most widely held quality qualification in New Zealand.

Currently the CQA course is offered through nine polytechnics and in 1991 a correspondence version was launched.

### Auditor Training

Another development was launched in late 1983. TELARC had extended its scope to include accreditation of Quality Systems. Both NZOQA and TELARC

had worked hard with others to develop an appropriate mechanism to accredit such systems.

Both organisations recognised that there was a need to train auditors and company staff who would develop the systems if the programme was to go forward. Working under a joint Memorandum of Understanding, NZOQA and TELARC commissioned Tony Stephenson of International Quality Consultants, to develop an appropriate course. The first course was offered in December 1983 and in response to a strong demand it travelled around the main centres during 1984 and 1985 and in August 1985 it was domiciled at Massey University. In May 1986 the course was extended from three to four days and through IQC became recognised by IQA.

In 1989 NZOQA launched its own Quality Systems and Auditing Principles Certification and Auditor Registration Scheme. It was intended that this scheme would be registered under JASANZ. The scheme involved an examination and quality assurance experience requirement resulting in the Certificate in Quality Systems and Auditing Principles followed by auditing experience and peer review requirements leading to registration as a Registered Quality Systems Auditor.

In 1991 the Auditor Training Course was again revised and extended to five days.

In 1992 JAS-ANZ decided there should be only one auditor registration scheme in Australasia and opted for a proposal from the Quality Society of Australasia. This was supported by NZOQA who negotiated transitional arrangements to merge its scheme into the QSA one. Hence the auditor registration was

transferred to the QSA but the CQSAP examination was retained as an entry qualification for auditor registration with the new scheme.

### **The Quality Management Campaign**

During 1983 and early 1984 National Council became increasingly concerned that its efforts to spread the Quality Message throughout New Zealand industry were not progressing at a rate that it would like.

It had become obvious that if top management and a wider spectrum of industry (especially the service sector) was to be reached a much higher profile, nation wide approach would be needed.

A long term, carefully targeted plan was developed by NZOQA and TELARC through consultation with a wide spectrum of organisations.

A consultative document, "A New Zealand Plan for Quality" was widely circulated and in December 1984 a meeting of all interested parties appointed a steering committee comprising representatives from NZOQA TELARC and nine other interested parties to advance the plan.

Unfortunately the committee only met once (in March 1985). Despite considerable goodwill it became evident that all parties did not have sufficient discretionary time to allow them to progress the work. By October it was obvious that all momentum had been lost and the project was foundering.

In November 1985 Mr Malcolm Bell of TELARC proposed to NZOQA that the two organisations should formulate a joint approach to Hon David Caygill,

Minister of Trade and Industry, requesting that his department take on the role of co-ordinating the campaign.

By late 1986 the minister had, decided to support a campaign which was developed and launched in 1987.

The main features of the campaign were:

- Publication of Case Studies of New Zealand Companies
- A Quality Information Referral Service
- Production of a Video on Quality Management Practice in New Zealand
- Quality Management Workshops for C.E.Os
- Quality Management Workshops for Middle Managers.

The video featuring New Zealand success stories was available for purchase at a nominal price, as well as being a major component of the Quality Management Workshop programme.

The half day Quality Management Workshops for C.E.Os were designed to expose company C.E.Os to Quality Management ideas in a small workshop with their peers.

Approximately 70 workshops were conducted. With between 10 and 20 C.E.Os at each workshop, this represents approximately 1000 C.E.Os.

The undoubted success of the Quality Management Campaign has resulted in the Ministry of Commerce continuing to actively promote quality management concepts to industry.

### **The Quality Advancement Program**

In 1992, the New Zealand Trade

Development Board (TRADENZ) launched a joint programme with the Food and Beverage Exporters Council (FBEC) to promote the Adoption of ISO 9002 and TQM with the food and beverage export sector. The programme followed closely the Quality Management Campaign model but in addition a complementary series to two day workshops "Putting ISO 9000 in Place" was presented by NZOQ to provide training in the fundamentals of ISO 90002 for this industry.

### **ATI Diploma**

In October 1992, Auckland Institute of Technology launched a Graduate Diploma in Quality Management under licence from the Royal Melbourne Technical Institute. This is a two year part time course involving on average three hours per week tuition. Tutors are drawn from Australia, ATI and local industry.

### **Other Developments**

TELARC had for some years provided training courses on various aspects of laboratory management as an adjunct to its Laboratory Registration Programme. In 1989 it formed an alliance with Brooks Royston International Quality Consultants and Temple Associates called The Quality College to formalise and considerably expand its Quality Assurance education and training programme. Much of the emphasis of the courses offered centres around the three themes of laboratory management, documenting quality systems, and internal auditing although more recently it has begun to become involved in the total quality management area and to widen the scope of its auditor training.

During the 1980s, the Department of

Production Technology moved its industrial extension activities away from a large annual conference to block courses. Four day courses in Statistical Quality Control and in Developing Quality Systems have been developed to augment the Auditor Training Course. These courses have proved so popular that they were run a total of 12 times in 1990.

NZOO has also experienced an ever-increasing demand for one day seminars on selected quality related topics often run in conjunction with other kindred organisations such as the Manufacturer's Association, Institute of Food Science and Technology, IPENZ.

Some professional groups such as the New Zealand Institute of Architects have begun offering quality management seminars for their members.

The late 1980s has seen the inclusion of quality related material in courses outside the traditional science, engineering and technology fields. For example at Massey University there has for several years been a strong theme of quality assurance being taught within the Nursing Studies Department and more recently in Business Studies especially in Management Accounting. Since its inception in 1989, the Massey Executive M.B.A. programme has included a module on Quality Management and the University of Canterbury M.B.A. has an elective TQM.

This broadening awareness of quality is permeating courses in other Universities and Polytechnics. Particularly in Engineering Science and Commerce Departments.

## Future Developments

Past experience has shown that the teaching of statistical and quality management principles is not successful in producing change. We therefore expect that the teaching of quality topics will become more integrated within a framework of organisational strategy and change.

The rise and demise of the W Edwards Institute in the mid 1980s and the growth of its successor the Total Quality Management Institute suggest that the focus of quality education in the 1990's might shift from its current emphasis on quality systems and accreditation to ISO 9000 towards the broader vision of the Total Quality Management movement.

Already the importation of by the Ministry of Commerce of the Australian Government developed NIES TQM and World Class Manufacturing programmes has resulted in the training of over 20 consultants to deliver these programmes.

We expect that involvement in the Total Quality Management philosophy will generate an increased demand for training in Statistical Process Control, a topic that has experienced considerable resistance up until now, probably because it has been seen as too difficult to implement.

We also expect that the inclusion of quality studies within other disciplines will continue to increase. Certainly we believe that the education of non-quality specialists in the basic quality management principles is prerequisite to maturity of the quality function within an organisation.

Only when there is a basis of general understanding of the quality disciplines



within an organisation, can it hope to achieve the cultural change necessary for quality to become part of the fabric of the operation.

## **EDUCATION PROGRAMMES**

### **INTRODUCTION TO QUALITY ASSURANCE**

This course is directed at those wishing to obtain a first introduction to the basic ideas and techniques of Quality Assurance. It comprises 12 weeks (two hours per week) of evening classes taught at local Polytechnics wherever sufficient numbers and suitable tutors are available. A comprehensive set of course notes is provided.

### **CERTIFICATE IN QUALITY ASSURANCE**

This course is directed at those members of the work force who have a clearly identifiable role associated with quality.

The course comprises 36 weeks of evening classes (two hours per week), taught through the Polytechnic wherever there are sufficient numbers and suitable tutors available. In some locations the course has been provided inhouse.

The programme gives a broad view of the quality area and provides an understanding of the basic philosophies, techniques and systems that are involved in quality assurance and quality improvement. It caters for the needs of Q.A. personnel at all levels, as well as those with a more general interest in quality.

Comprehensive course notes are provided and it is possible for students

who do not live within reasonable distance of a Polytechnic offering the course, to study the course by correspondence.

A four-hour examination based upon the course is offered each December and successful candidates are awarded a Certificate in Quality Assurance once they have completed two years work experience.

It is not necessary to take the course in order to sit the examination. Any individual who wishes to sit the examination may do so. Conversely students who attend the Polytechnic courses are not automatically enrolled in the examination. If they wish to sit the examination they must enrol separately.

Holders of the Certificate in Quality Assurance may use the letters C.Q.A. after their name.

### **QUALITY SYSTEMS ASSESSMENT COURSE**

This is a four-day block course developed by NZOQA and run on its behalf by the Department of Production Technology at Massey University. It provides practical and comprehensive training in the auditing of quality systems and is intended for individuals who already have a sound background in the principles of quality assurance. The course provides an in-depth study of Quality Systems Standards and training for Quality Systems Lead Auditors. The course is extremely intensive and involves extensive attendee participation in workshops and case studies.

Comprehensive notes as well as pre-course and post-course readings are provided.

When sufficient students on the course are interested arrangements are made to provide the Certificate in Quality Systems and Auditing Principles examination at the conclusion of the course.

For organisations with the need to train large numbers of auditors, arrangements can be made to present this course in-house.

A similar course approved by the IQA and JAS-ANZ is offered by International Quality Consultants. Both courses have the same parentage.

### **CERTIFICATE IN QUALITY SYSTEMS AND AUDITING PRINCIPLES**

This is a three-hour examination for quality practitioners with at least five years' experience in quality assurance and quality management. No candidate is refused admission to the examination but they may be required to obtain further relevant experience before certification is granted.

There is no specified course leading to the examination but a syllabus on which the examination is based is published and several courses are available in New Zealand which provide tuition in the topics covered by the syllabus. One such course is the Quality Systems Assessment course outlined above. Other suitable courses are also provided by Massey University and International Quality Consultants (Auckland). While being a stand-alone qualification itself, the CQSAP in combination with an approved training course meets the academic requirements for the registration of auditors under the QSA scheme (see below).

Holders of the Certificate in Quality Systems and Auditing Principles may use the letters CQSAP after their name.

### **REGISTERED QUALITY SYSTEMS AUDITORS**

QSA operates a scheme for the registration of Quality Systems Auditors within Australia and New Zealand.

All applicants for registration must have attended a JAS-ANZ approved training course and completed the CQSAP (see above) or an alternative examination.

In addition, applicants must provide evidence of having completed at least 15 days of quality systems auditors for internal auditor registration, 20 days for auditor registration and 25 days for lead auditor registration. Before obtaining registration applicants, must also undertake to comply with the code of conduct for auditors.

Registration must be renewed every two years.

### **DIPLOMA IN FOOD QUALITY ASSURANCE, DIPLOMA IN QUALITY ASSURANCE**

These two qualifications are six-paper post-graduate/post-experience Diplomas offered by the Technology Faculty at Massey University. While they are strictly University qualifications, they are supported by NZOQA and members are encouraged when appropriate to pursue these diplomas.

Both courses are run extramurally by Massey University, and require attendance at short courses during May or August vacations.

### **ATI GRADUATE DIPLOMA IN QUALITY MANAGEMENT**

A two year part-time post-graduate diploma provided by Auckland Institute of Technology under licence from Royal Melbourne Institute of Technology. Taught internally, it requires an average of three hours per week classroom attendance and is constructed on a modular basis.

### **MEMBERS NIGHTS**

Many of the members' evenings held by NZOQA Divisions and Branches provide an opportunity for informal education, with local and visiting speakers offering their experience and knowledge.

### **SEMINARS**

From time to time, NZOQA organises formal seminars with local or overseas speakers. These are usually one or two day events arranged by NZOQA either alone or jointly with other organisations.

As a non-partisan organisation, NZOQA does not endorse any particular approach to Quality to the exclusion of any other. However, NZOQA tries to provide its members with as many opportunities as possible to hear eminent thinkers in the Quality and Productivity arena, and also to hear of the practical experiences of members and member companies in New Zealand.

Some of the eminent speakers that NZOQA has sponsored or supported in the past are: General Walter Hurd, Rear

Admiral D.G. Spickernell, Dr Walter Masing, Dr H. James Harrington, Dr W. Edwards Deming, Mr Max McRobb, Mr Allan Sayle, Prof Miflora Gatchalian, Mr Herb Schwartz, Dr Herb Rogers, Mr Masaaki Imai, Mr Taichi Ohno, Mr Y. Iwata, Dr Blanton Godfrey and Mr Daniel Kwok.

### **ANNUAL CONFERENCE**

Every year NZOQA organises a three-day conference where quality professionals from New Zealand and overseas meet to present their ideas and exchange experiences. In May 1994 the conference will be held in Auckland.

### **FURTHER ENQUIRIES**

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