In Search of Quality

The Hong Kong Institution of Engineers - Electrical Division
The Thirteenth Annual Symposium, 1995

THE HONG KONG INSTITUTION OF ENGINEERS

ELECTRICAL DIVISION

The Thirteenth Annual Symposium

Tuesday

24th October 1995

IN SEARCH OF QUALITY

at

Silver Ballroom

Sheraton Hotel

Nathan Road

Kowloon

Hong Kong

SYMPOSIUM PROGRAMME

08.30 **Registration and Coffee**

09.00 **Welcome Address**
- Ir. K.W. Tong
  Chairman, Electrical Division, The HKIE

09.05 **Opening Address**
- Ir. Edmund Leung
  President, The HKIE

09.10 **Keynote Speech**
- Ir. Prof. Y.C. Cheng
  Vice-Chancellor,
  City University of Hong Kong

1. ISO9000

09.40 **Quality Assurance for Housing Projects**
- Mr. Raymond Bates
  Senior Assistant Director/
  Maintenance and Construction Services,
  Housing Department
  Hong Kong Government

10.00 **Implementation, Operation & Maintenance of a Quality Management System Satisfying the Requirements of ISO 9001**
- Mr. Bill Ross
  Quality Assurance/Health & Safety Manager,
  RUST Asia Pacific Ltd.

10.20 **Discussion**

10.40 **Coffee Break**

2. Total Quality Management

11.10 **Management of Change at Castle Peak Power Station**
- Mr. David Powell, Station Manager, &
  Ir. S. K. Wan, Maintenance Manager,
  Castle Peak Power Station,
  China Light & Power Co., Ltd.

11.30 **Re-engineering Project Experience in the Distribution and Customer Services Group**
- Ir. C.H. Cheung, District Manager,
  Ir. Leslie Y.S. Au, District Manager, &
  Mr. Langston L. T. Yung, Accountant,
  China Light & Power Co., Ltd.

11.50 **Business Re-engineering: The Dramatic Search for Quality**
- Dr. K.K. Tse
  Managing Director,
  K.K. Tse & Associates

12.10 **Discussion**

12.30 **Lunch**

3. Service Culture

14.30 **Change of Service Culture on the KCR**
- A Quest for Excellence
- Mr. Martin Brown
  Head of Operations,
  Kowloon - Canton Railway Corporation

14.50 **HEC's Vision and Strategy of Customer Service**
- Ir. W.M. Choi
  Senior Customer Supplies Engineer,
  The Hongkong Electric Co., Ltd.

15.10 **Discussion**

15.30 **Coffee Break**

4. Electrical Product Safety

16.00 Proposed Electrical Products (Safety) Regulation

- Ir. T.P. Uy, Chief E&M Engineer, &
  Ir. W.H. Sit, Senior E&M Engineer,
  Electrical & Mechanical Services Department
  Hong Kong Government

16.30 Discussion

17.00 Summing Up

- Symposium Chairman,
  Ir. David Yuen
  Distribution Manager-East,
  China Light & Power Co., Ltd.

17.15 Closing Address

- Mr. Gordon K.C. Siu, JP
  Secretary for Economic Services,
  Hong Kong Government

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Paper No. 1
(Keynote Speech)

IN SEARCH OF QUALITY

Speaker : Y.C. Cheng
Vice-Chancellor,
City University of Hong Kong

IN SEARCH OF QUALITY
(Keynote Speech)

Y.C. Cheng
Vice-Chancellor,
City University of Hong Kong

May I first of all thank the Chairman and organizers of this Symposium for inviting me to speak today. I should confess that I am a little hesitant to offer this audience a "keynote address". After all, what can a university official offer to hard-headed men and women who must attend daily to the bottom-line?

What I hope will be useful to you is to show you how some of the distinctive features of the work of universities has influenced their "search for quality". I want to go on to argue that because these distinctive features are, in a less extreme form, features of many other organizations, what we have learned in universities has a wider application.

Any good idea, once it gets out into the world, drifts away from the precepts laid down by its originators. "Quality Management" is no exception. By the time universities caught on to the quality revolution, what exactly Deming and Juran had to say about quality management was long forgotten. Despite this, two core ideas associated with the quality movement have found resonance in universities around the world. Firstly, there is the notion of serving customer needs through "continuous improvement". Secondly, there is the stress on devolving responsibility for quality and building up a "quality culture".

These broad principles are valuable to any business. They are valuable to universities, in part, because universities are like businesses. We are in a very dynamic growth industry — the learning/information branch of the service sector. Serving customers with a quality product and involving staff at all levels in this effort, makes as much sense to us as it does to the other organizations in our industry.

However, as I indicated, certain distinctive features of the work of universities has influenced the way in which these principles have been applied. The first of these features is the extraordinary difficulty of measuring our "value added". In many businesses, value added is simply the difference between the cost of inputs and the market-value of the output. We have problems at both ends. We have very imprecise measures of the value of our raw material and similarly imprecise measures of the value of our finished product. Nor can we be certain to what extent we have been responsible for any observed increment in value. Our students grow up whatever we do. Because value added is difficult to measure, we are forced to pay attention explicitly to achieving "fitness for purpose" in our output — as Juran advises. Because outcomes are difficult to assess, we must pay special attention to the quality of the process for achieving them — as Deming suggests.

Universities are certainly not the only organizations that have problems measuring value added. Perhaps we could advance the general hypothesis that quality management becomes more critical to the extent that exact measures of accomplishment become more elusive. In the longer run therefore, the quality revolution may have more impact on non-profit organizations, and firms producing services — hospitals, government offices, consultancy firms and so on, than on the manufacturing businesses where the ideas were first worked out.

A second distinctive feature of universities is their system of governance. Nothing can be done in a university until a committee has sat on it and everyone has been consulted. This style reflects jealously-guarded traditions of institutional autonomy and professional freedom. The quality movement's emphasis on a collective responsibility for quality has fitted in well with these traditions. Indeed in many cases, the shift from top-down systems enforcing standards and stressing accountability toward the devolved management of quality has revitalised and refocussed university governance. At a university, a quality culture can be developed that captures much of the spirit of professional responsibility and self-regulation.

Again universities are not unique. There are other organizations with assertive professional staff. As time goes by, knowledge-based businesses are becoming more and more important. Like universities, these businesses will have to find a workable compromise between the "leave-me-alone-to-do-my-job" instincts of their staff and the need for results and accountability. The effort of universities to develop their own version of the quality culture concept may be a helpful precedent.

Despite the "good fit" between the concepts of quality management and the situation of universities, our experience with the quality revolution has not been without its stresses. I would like to refer to two problems: the need to combine a quality culture that emphasises self-regulation with the legitimate demand for external accountability; and the need to balance the benefits of increased quality with the costs incurred to achieve these increases.

The size of the public subsidy to universities and greater demands on governments to provide value for money have led to the increasing scrutiny of university operations. This can set up an unfortunate tension between a bottom-up approach to quality improvement and top-down pressure to show results. At its worst, staff can become confused and demobilised by the mixed signals, incentives become distorted and attention can become focused on providing the appearance of quality, but not the staff-level commitment that really counts.

Fortunately, a solution to the problem is emerging. Governments are being urged to base external scrutiny on a formal "self-assessment" by the unit being evaluated. Self-assessments set out the objectives of the unit, provide a critical appraisal of the extent to which those objectives are being met, and indicate how the unit intends to reinforce the good and remedy the bad points in its operation. Thus the self-assessment document enables the professionals responsible for the work, the people who are the only real experts, to establish the agenda for assessment.

The task of the external assessor is to measure and comment on the gap between what the unit says it is doing and what it is actually doing. With the right mix of internal honesty, a desire to improve and balanced, well-informed, external judgements, this kind of assessment can be very constructive. At my own university, we have made this approach the model for our internal quality management, our so-called quality audit. Each faculty in turn will be asked to provide a critical appraisal of its quality management. This appraisal will provide the basis for an audit of the faculty's system by colleagues from other faculties.

Perhaps this is a way forward for other organizations dealing with similar tensions between bottom-up and top-down strategies to deliver a quality product or service.

The last important issue I want to look at is the problem of balancing costs and benefits. This is a matter that has been discussed at some length in the quality management literature. Some theorists have called for out-and-out efforts at quality improvement, apparently neglecting costs. Others have constructed schemes for optimising costly efforts to improve quality, but have therefore downplayed "continuous improvement". How does this debate look from the perspective of a university?

There are two kinds of benefit from higher quality, those that flow from a reduction in defects, and those that flow from greater customer satisfaction. One benefit of getting the product right the first time is that it is costly to check for, and to remedy, defects later. Universities do not provide warranties on their graduates, or their research. Perhaps they should. If our graduates lack the promised skills, why shouldn't we be liable to remedy the problem free of charge! The other benefit of a low level of defects is that this protects our reputation. Since a university survives on its reputation, the call for "zero-defects" is at least as relevant to us as it is to an auto manufacturer.

In a more general sense, a higher quality product is a product that more closely conforms to customer preferences, including a preference for fewer defects. Universities have never been good enough at serving their clients. In part, this is because the product we deliver is complex and subject to continual changes in specification. But it is also the result of generous public subsidies. If we delivered to a market, the product price would provide the required information about the mix of attributes most highly valued by graduates and by their employers.

In this regard, the quality movement's stress on client satisfaction has been a very timely reminder to universities. There is nothing inevitable about the continued existence of the classic university. We

would not be the first institution with an ancient pedigree to come to the end of the line. Lacking commercial data, we are trying to make better use of other indicators of client needs — surveys of students, graduates and employers, getting out and meeting people in industry and so on.

To a university, therefore, the benefits of higher quality output are very substantial. So much so, that the slogan "continuous improvement" might be worth retaining. But I do not see any way that a university could neglect the costs of quality management. We are multi-product firms. When resources are devoted to improvement in teaching and learning the resources available for advancing knowledge are reduced. To make the best use of what we have, we must find a proper balance between the cost of increased quality and the benefits.

The costs are certainly very large. The design and redesign of high quality courses, checking and maintaining standards, evaluating and enhancing teaching, optimising the conditions for student learning, keeping staff abreast of new teaching methodologies and technologies, the committee work necessary to balance bottom-up and top-down quality strategies call on staff time and staff energy at every level.

I would like to make two points about these costs, points that may strike a cord with others struggling with similar problems. Firstly, I don't believe any university administrator could give you an estimate of the actual costs being incurred. While we expect staff to participate in our quality culture, we cannot assume that this does not drain resources from other activities. Good management of quality is possible only if we know what we are paying for it. As things stand. I don't believe we do know the price tag.

Secondly, any consideration of costs leads to a consideration of productivity. If we want to find the resources necessary to search for quality, one way forward is to seek higher productivity in other areas of the operation. In this regard, we have been working to "reengineer" a number of important processes at the University. We have begun with processes located in our central administrative services.

As we build up expertise and confidence, perhaps we can begin to think about reengineering teaching and learning. For universities, the opportunities and threats posed by the information revolution make the question of productivity in teaching and learning newly complex and uncertain. What is the future of the university once textbooks are transformed into multimedia "courseware" offered on "the net"?

This is a final lesson from our experience that I can leave with you. An emphasise on quality has taken us quite far in the right direction. As an antidote to complacency, continuous improvement has had much to recommend it. Universities have reoriented themselves to client service and quality outcomes. But right now, I believe universities, along with many other agencies in the "knowledge business", face quite new demands. It is already obvious that our quality revolution is only an aspect of a larger technology-driven revolution about to radically alter our way of doing business.

This paper with contributions from Dr. David Mole, Secretary of the Quality Assurance Committee, City University of Hong Kong.

Paper No. 2

QUALITY ASSURANCE FOR HOUSING PROJECTS

Speaker : Raymond Bates
Senior Assistant Director/
Maintenance and Construction Services,
Housing Department
Hong Kong Government

QUALITY ASSURANCE FOR HOUSING PROJECTS

Raymond Bates
Senior Assistant Director/
Maintenance and Construction Services,
Housing Department
Hong Kong Government

ABSTRACT

In the wake of concerns over the condition of buildings constructed in the 1960's, and the increasing aspirations of tenants, the Housing Department decided to change the attitude of an industry. The paper examines the way this was achieved through quality control, performance audits and quality assurance. It looks at the way a customer service culture is starting to change the way the Housing Department thinks and operates. The impact of these initiatives on quality and safety is discussed, as well as the findings on whether or not staff in the Department really think that Quality Assurance works.

1. INTRODUCTION

Construction and property contribute over 23.5% of our gross domestic product. This is a similar contribution to that made by our wholesale, retail, import/export, restaurant and hotel industry. Last year, the value of our property stock was estimated by the Department of Surveying, Hong Kong University to be HK3,300 billion excluding government buildings. A substantial portion of this is Public Housing. 35% of government expenditure is on property. It is crucial that we protect this investment [1].

Hong Kong is now embarking on the most ambitious infrastructure development in its history. Hong Kong is developing as the hub for providing high calibre professional and construction services to the Asia pacific region. It is vital that the legacy we leave to future generations is remembered with pride, a pride that is built on the assurance of quality.

2. THE CLIENT DRIVE

Paper No. 2

It is our clients that are driving the process of perfection. It is they who are insistent upon zero defects. In 1990, the Governor launched the Hong Kong Quality Awareness Campaign, in the same year the Hong Kong Quality Assurance Agency was established. It was the year that the Housing Authority decided to change the shape of the construction industry in Hong Kong forever.

The 1960's had left a bitter legacy of poorly constructed slopes, and buildings constructed with sub-standard concrete. While many of these fundamental problems have been addressed, we can take no satisfaction that a first time flat buyer is still often upset to find that the flat he has bought is smaller than that indicated on the brochure, that the windows and drains leak or that the electrical supplies are overloaded within one or two years.

The last decade has seen Hong Kong propelled into being one of the world's ten wealthiest countries. More people than ever own their own homes. Political evolution has provided a voice for discontent to be aired, it provides a platform to challenge shoddy services. With this evolution has come an increasingly sophisticated customer with higher expectations. What was accepted in the past is not good enough for the present, and will not be good enough for the future.

The Housing Authority houses half the population of Hong Kong and manages an extensive portfolio of shopping centres, factories, schools, recreational and community service facilities. It has not been immune from poor design and construction, nor from the increasing aspirations of the people of Hong Kong.

3. THE ATTITUDES OF AN INDUSTRY

Much of Hong Kong's construction and maintenance culture is driven by the developer's policy of buying from the lowest bidder, driving professionals or contractors into competition by price rather than quality. Tenders are priced with the sole purpose of securing a contract at a price that reflects what they believe they can get away with. It was with some discomfort when the Housing Authority started to understand its own role in pushing quality down through its procurement policies.

This is not to imply that cost is not a key factor, but that cost should not be at the expense of an attitude of, "I know the customer has not got what he wants, but what does he expect at that price".

The construction industry has for some time experienced difficulty in attracting young people to the profession. Construction sites are often remote, dirty, wet and hot. A poor safety record has done little to improve a bad image.

What was needed was a fundamental change in the way an industry operated, and in the relationship between the Housing Authority and contractors. There was a need to change both basic attitudes and culture. This had to be started with the Housing Department itself, and extened to contractors and consultants. The keystone and starting point was the ISO 9000 standard and procurement methods. The vision was to change the way an industry operated. It is a vision that the Authority is determined to push forward. You can opt in or opt out, but remember if you choose the latter, it can be very cold out there.

There was a clear need for the Housing Department's Works Group to get its act in order. There always appeared insufficient time to complete contract documentation before tender. There was inconsistency between decisions taken by different project teams, the relationship with contractors was often adversarial. Some design details were difficult to construct, but then that was the contractor's problem, or was it!

A strategy evolved that applied pressure from both ends, Quality Assurance and Quality Control. Certification to ISO 9000 would be a mandatory requirement for contractors who wished to work for the Housing Authority. Quality control would be used to measure contractors' performance, and tendering opportunities would be related to performance. The Works Group of the Housing Department would be certified to ISO 9001.

In 1989 the Housing Authority stepped up measures to improve quality. It was decided that the Works Group of the Authority would develop a management system complying with ISO 9000 by mid 1993. At the same time, a Housing Authority list of contractors was established with a requirement that contractors should achieve registration to ISO 9002 by 31 March 1993. This was to extend to Building Services Contractors in 1994 and 1995, and by April 1996 to consultants.

From a platform, a foundation of Quality Control and Quality Assurance longer term objectives of Total Quality Management was feasible.

4. WHAT IS QUALITY ASSURANCE ?

What is quality assurance? Let us started by saying what it is not. It is not about setting standards. It is the client that sets the standard. Quality Assurance is about providing assurance that client's requirements are met, first time and every time.

5. PUBLIC HOUSING

The Housing Authority houses half the population of Hong Kong. It constructs some 40,000 flats each year with 110-120,000 under construction at any point in time. This will increase to over 60,000 per annum with 200,000 under construction at any one time by the end of the decade. The Authority manages

and maintains a stock of over 800,000 flats together with 1.6 million m^2 of commercial property.

Standards of public housing have been increasing steadily over several decades. The space standards, finishes, facilities, layout and environment have all seen improvement. However, this has not always been matched by improvements in quality.

6. PRICE VERSUS QUALITY

In 1989 the Housing Authority decided to set up its own list of building contractors. This created opportunities to develop a closer relationship with contractors, and to control listing conditions. One condition that is having a profound impact on the construction industry is that contractors are required to achieve registration to ISO 9000, if they wish to work for the Authority.

Contractors on the Housing Authority's lists do not have an automatic right to tender for projects. It has always been the practice to debar contractors with poor performance. However, the problem has been that those just scraping by were treated in exactly the same ways as those producing high quality work. Since September 1991, tendering opportunities have been based on performance. Good performers are invited to tender for all contracts, those just scraping by are only given limited tendering opportunities.

While contracts are still let on the basis of price, the message is clear, only contractors who are able to compete on quality will continue working for the Authority.

The construction industry has a large number of levels of subcontracting; it has a large number of suppliers. The decision to go the quality assurance route will have a rippling effect well beyond the Housing Authority list of building contractors as main contractors impose quality assurance down the line.

7. PASS

The Performance Assessment Scoring System (PASS) was introduced to provide an objective measurement of quality. It has been developed and refined to provide a monthly assessment for each project throughout each contract period. Random sample checks are carried out for compliance with the contract. The checks either PASS or FAIL. There are no good, average or poor subjective decisions. Full compliance gives a total of 100 points.

In this way, it is possible to compare contractor with contractor, site with site. It is possible to explain where non-compliances are occurring and whether there has been improvement over time. Contractors tendering opportunities are dependent upon their PASS score and the system provides a powerful incentive to improve.

8. IMAGE

The Housing Authority demands a 'Quality Industry'. It is not just a question of image, but a need to make construction sites safer, cleaner places to work. As a major developer, the Authority is in a position to influence this through contract conditions and other initiatives. Changes have included banning work on Sundays, specifying the levels of toilet, washroom and canteen facilities required, tightening up on site safety and initiating research into safety.

9. HOUSING DEPARTMENT

The Housing Department Works Group provides **professional services** for the **planning, design, project management and contract administration for the construction, maintenance and improvement of Public Housing developments.** The Group employs 3,700 staff including 700 professionals from eleven different professions. The Group is probably

the largest professional design practice in the world to achieve ISO 9001 certification. Can the standard apply to a professional practice? My response is an emphatic yes.

10. THE COMMITMENT

The most crucial factor in implementing Quality Assurance is commitment. Lack of commitment by senior management in implementing a Quality Assurance System will lead to failure. Change is a painful process, and quality assurance will reveal hidden conflicts. Quality Assurance requires resourcing, it results in organization and procedure changes, and it should also lead to a culture change. This process can only be driven from the top.

Management must be prepared to roll up their sleeves and work. In our case, all Divisional Heads and above were all personally involved throughout the development period. This included the critical examination of the objectives, responsibilities and the way the organization operated. Senior staff members were directly involved in reviewing and documenting key procedures, as often they were the ones who were most familiar with these procedures. They were responsible for overseeing implementation.

The emphasis should be on involving as many staff members as possible. Surveys indicated 26% of our staff had been involved in developing the system. Over 3,000 staff members were involved in our training programmes.

11. VISION NOT VOLUME

"Old men dream dreams, young men have visions". It is vision that leads to a mission, and a mission that leads to business and action plans. Plans lead to results. Procedures and records are the means of achieving the vision-plans and service standards, they are not an end in themselves. If documentation or procedures are excessive or complex, then why? Is this not the fault of management?

The starting point in Quality Assurance is to be quite clear on the services that you provide, and how they align with your objectives. It is crucial that business (management) reviews, audit feedback and preventive action are then used as a continuous mechanism to drive the improvement process.

In the early development stages, there is a tendency to overlay new requirements imposed by the standard onto existing systems operating within a company. Typically these could include document control, quality plans and records, audit and calibration. It is important that the opportunity is taken to rethink how the organization operates. While it may be difficult during the development of a Quality Assurance system integrating quality assurance into the day-to-day management of a firm, continuing improvement must be interwoven into the fabric of a company. ISO 9000 is the start but not the end.

12. THE EVOLUTION OF A SYSTEM

Quality Assurance is a life-long quest. The first step of achieving ISO 9000 certification will take 9-36 months depending upon the size and complexity of the organization, and how well developed the existing systems are. In our case, the evolution of a Quality Assurance System has required three stages :

- **Development**
- **Implementation**
- **Improvement**

In the **development stage,** a consultancy study identified weaknesses in the existing management system when compared to the ISO 9001 standard. The strategy developed was a road map. There was a clear objective, but a number of ways it could be achieved. A sound understanding was needed of exactly what services were being provided, to whom, and who was responsible for providing the services. From this starting point, improved procedures were developed and documented.

Training and awareness programmes involved everyone.

The **implementation stage** tested the new systems through audit, this included a pre assessment audit by the HKQAA. New and old procedures were tested. Some were found wanting and improved. This stage was to form an essential part of the learning curve where problems could be ironed out and new systems made to work. This stage created most pressure on the organization but it culminated in a successful certification audit.

The **improvement stage** is ongoing, it is anchored around regular management or business reviews. In our case, there is a planned period of consolidation, which includes a number of quality improvement projects. This will give way to total quality management as the culture of the organization starts to change.

There is a clear peak in **costs** during the development phase. Many of the costs are related to improving management systems. In most organisations, these costs would be incurred irrespective of a decision to implement a formal quality system. In terms of direct staff costs required for the management of quality assurance, training and auditing, our costs varied between 1% - 3% of total staff costs during the development and implementation stages, and 0.9% in the post certification improvement stage.

13. QUALITY FACT OR FICTION

Is Quality Assurance really worth the cost?

In June 1972, a landslide hit a temporary housing area. Over ninety people were killed. Four years later, just 300 meters away a slope failure at the Sau Mau Ping estate left seventeen people dead.

In 1980, a ceiling collapsed in Kwai Fong Estate. The estate was just eight years old. Structural investigations published in 1986 indicated that half of the public housing blocks constructed before 1981 had mean concrete strengths below the specified standards. The results contributed to a decision to redevelop almost all public housing constructed prior to 1972. Over 500 buildings are being reconstructed, the cost is some $35 billion at 1995 prices.

Water pipes have rusted within eight years, some trident blocks had electrical supplies reinforced after two years, windows have leaked. Inadequate control of drawings has led to a building services design being based on an obsolete architectural drawing. In another case, the electrical design standard was incorrect because a personal photostat copy had been used that was out of date.

The catalogue of cost is almost endless. Quality Assurance has underpinned dramatic improvement. It is, however, difficult to isolate the contribution of any particular factor, for example the contribution of 'buildability' of designs to quality. What is certain is that Quality Assurance provides part of a management framework, and that quality has improved.

Since the push for Quality Assurance by the Housing Authority in 1990, compliance with contract as measured by PASS has improved from an average 65% compliance to 89%. In addition, the differential between the best and worst performers has narrowed.

The accident rate on Housing Authority sites has fallen by 74% over this period, and is one third of the construction accident rate for Hong Kong as a whole. Safety requires sound management practices that are followed, as well as good practice in the storage of materials. Both are driven by the ISO 9000 standard.

In talking to some Japanese industrialists, government officials and trade unions earlier this year, they considered improvements to productivity, quality and safety to be a single inter-related issue. The objective was to improve quality, productivity and safety for their own sake. Cost savings followed as a natural consequence.

14. PERCEPTIONS

"Give me the child to the age of seven and I will give you the man". ISO 9000 certification can be achieved in one or two years. Changes in the perceptions and corporate culture can take a decade in established organisations. It is, however, this change in attitude that is fundamental to underpinning and sustaining improvement. Organisations will stagnate if Management Review and Audit are not used effectively and with a will.

A number of surveys of attitudes of Works Group staff towards Quality Assurance have been carried out over the past three years [2][3]. In summary :

Improvements

- Quality Awareness, need and consciousness
- Better coordination
- Better communication
- Increased effectiveness
- Services to the public

No Improvement

- Efficiency
- Moral

The perceptions indicate the need to move on to the continuous improvement process, and to strengthen Human Resource Management. These are current targets.

The ISO 9000 standard provides a firm platform, it helps management in the way organizes its operations, it starts a customer focus. It provides a measurable milestone. Beyond that milestone, it is the organization itself that sets no limits to perfection.

15. HOW IS QUALITY ASSURANCE HELPING

The Housing Department Works Group runs thousands of projects; its staff operate out of over 30 offices and 100 site offices. Quality Assurance ensures consistency, and a management system that facilitates change.

Management Reviews

Used properly the management reviews provide the driving force for improvement. It is this systematic process that reviews the ability to meet objectives. It results in development of responsibilities and procedures to meet objectives, and it documents how this is achieved.

Although all our key procedures were reviewed, they are now being re-visited. Areas of inefficiency or risk are being eliminated. We have changed the way we manage and resource projects, but most of all we are changing the way we listen to our customers.

Audit

This is the way to listen to your own heartbeat, your own organization's state of health. It is important that staff perceive audits as a way that they can help management improve the system, and not a criticism of their work. It is a way that staff are able to feedback ideas or problems. Listen, most problems are because the system is wrong, not the people.

Communications

Most of our documents used to be obsolete in one way or another. There is now a clarity of information that is current and reliable across all our offices. Changes are not by word of mouth, they are documented. If someone leaves, the status of his work or how he did it does not leave with him. There is consistency in the way we operate.

16. CONCLUSIONS

The ISO 9000 is a stepping stone to a change in attitude. It can apply to professional services. It provides an essential toolbox to make the transition. It provides a systematic approach

for management to provide a quality focus. Implementation creates pressure and tension, but once through this barrier continuous improvement becomes the next goal.

"If better is possible, good is not enough".

17. REFERENCES

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(2) WONG Bay, "An Empirical Study of the Quality Drive in the Construction Branch of Housing Department", unpublished thesis. 1993

(3) WONG Chun-kwai, "The Quest for Quality Public Housing", unpublished thesis. 1995.

Paper No. 3

IMPLEMENTATION, OPERATION & MAINTENANCE OF A QUALITY MANAGEMENT SYSTEM SATISFYING THE REQUIREMENTS OF ISO 9001

Speaker : Bill Ross
Quality Assurance/Health & Safety Manager,
Rust Asia Pacific Limited

IMPLEMENTATION, OPERATION & MAINTENANCE OF A QUALITY MANAGEMENT SYSTEM SATISFYING THE REQUIREMENTS OF ISO 9001

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Quality Assurance/Health & Safety Manager,
Rust Asia Pacific Limited

ABSTACT

This paper will describe to you why a Consultancy Company, normally deemed to be part of the Service Industries, and whose prime business is the provision of Electrical & Mechanical Building Services Design, for installation by others, took the decision to implement, operate and maintain a Quality System satisfying the requirements of the International Standard ISO 9001, and also decided to have the system audited by a recognised Accredited body, in this case the Hong Kong Quality Assurance Agency, thereby achieving Certification of the Quality Management System.

1. QUALITY STANDARD(s) EVOLUTION

It is not completely certain when the concept of detailed Quality Standards was first put on the table, or by whom. However, it is largely accepted that Quality Control and Inspection, an essential element of Quality Management and Systems, was introduced, albeit on an uncontrolled, haphazard basis during World War 1, however, the benefits were not totally recognised by the various industries until after World War 2.

The USA Department of Defense were the first, in 1959, to produce a National Standard, MIL Q 9858A, which detailed various Quality programmes. This was followed in 1968 by the introduction of NATO's Allied Quality Assurance Publications(AQAP). However, these Standards were still geared towards the Military requirements, what was noticably missing were Quality and Product Standards which the private sectors of industry could endure, yet still market products that would be safe and reliable.

In 1972, the British Standards Institution (BSI), an independent body, established to regulate and assist the production of such standards, published BS 4891, 'A guide to Quality Assurance'. Finally, in 1979, BSI issued BS 5750, a Quality Standard in three main parts which addressed contractual elements,and others, as they related to differing types of industry product, each part designed to complement the level of Quality desired by each section of industry.

Following the 1984 revision to BS 5750, BSI put it to the International Organization for Standardisation (ISO). It was time to attempt a global harmonisation of Standards. ISO agreed and after many discussions with a total of 26 countries, the ISO 9000 series was launched in 1987.

Approximately 15 years ago, much later unfortunately than the manufacturing industries, the Construction Design industries senior management and trade associations of the UK, Europe, North America and Australasia began to realise that some form of standardisation was required to regulate performance and ensure not only a consistency of the end result, but a safe one. This need has now been extended to many other countries in the world, not less the Asia/Pacific region.

2. INTRODUCTION

Why should Consultants adopt a Quality System?

This really can only be answered by a further question, why should Consultants not apply the same standards to themselves that they expect from the installers and equipment manufacturers?

In the late 1960s', early 1970s' Consultant Engineering firms, of all disciplines, within the Construction Industry in Hong Kong, and elsewhere, recognised that their product/ service may not have, in all cases, satisified their customer requirements or even local and/ or national legislation. These shortcomings were especially noted by Building Services Design Consultants, who realised the way to overcome the above shortcomings would be the adoption, implementation and continual operation of a Certified Quality Management System which would enhance the Quality Control measures already employed. Not just a case of 'doing things right', more of 'doing the right things'.

In the absence of a suitable National Quality Standard in Hong Kong it was determined that the most applicable way to proceed was to implement a Quality System based on the requirements of ISO 9001. It was recognised that a Quality System, which documented all individual Company operations as outlined by ISO 9001, would greatly improve the Company's capability to comply with the customers' requirements at each stage of the contract, and at less cost, time, effort and be more friendly to the environment in terms of a reduction in materials wasted. The Consultantcy Industry in general, and Companies in particular, then had to consider how this could be achieved with the least disruption to daily activities and introduction to the staff.

3. MANAGEMENT DECISION & COMMITMENT

Obviously, the decision and commitment has to be made by the top Management. However, what are the points they have to consider? The following are not, by any means, all the points for consideration at the initial and later stages, but are merely highlighting the most important ones.

- What will be the extent, and impact, of the commitment?

  In reverse order, the commitment has to be endorsed by all top Management through a Policy Statement. Impact is the consideration of how much change to the current system of operations may be required. Extent identifies the areas where change, for the better, is required.

- How will the scope of services provided be described?

  This is relatively easy, since the scope defines, in a short concise sentence, what the particular Consultancy actually provides e.g., Electrical & Mechanical Building Services Design, or more if that is the case. The trap here is to fall into too much definition and forget about exclusion of some activities which may not always be relevant.

- How should the System be introduced?

  This is entirely at the discretion of the Management. They are fully aware of the Company workforce capability to absorb some changes to the previous procedures which, of course, will not meet with approval from all quarters. A 'Hearts and Minds' programme has then to be set out to convince everyone that the adoption, implementation and continual maintenance of a Certified Quality System will be beneficial, not only to the Company, but also to them in that, it would reduce duplicity of effort because something was overlooked the first time, less time would be required on each new Project, due to the fact of having

previously produced a similar documented design, and most of all, alleviating a large proportion of stress. All the above, of course, will require early staff involvement at all levels.

4. EARLY STAFF INVOLVEMENT

As stated above, this is essential to the successful introduction, implementation and maintenance of the Quality System. Everyone within the Company Organisation has a certain level of responsibility for implementation, operation and maintenance of the System. In Design Consultancies of any Construction Discipline, this is not an easy message to convey. To overcome this degree of what should be minimal change, is a stage by stage approach to the various parts of the System affecting each level through training in the Company Quality System and an awareness of the ISO Standard requirements.

5. IMPLEMENTATION

As previously stated, the implementation of a Quality Management System will meet a certain amount of resistance, even though it has been introduced gradually. This is not easily overcome and may even continue throughout the Operation and Maintenance of the system.

Implementation is accomplished by the issue of a Quality Manual which contains the Directors Policy Statement, objectives, procedures and forms to be utilised by all staff, at whichever level, to ensure a harmonisation of effort in every area of the Company. It also involves a series of internal audits to assist in the correct application of the System according to the procedures. Although the System should not change any of the Company operations, it will describe various activities in more detail. This is one area where a certain amount of resistance will be eperienced, a case of "if it works, why fix it?" However, as understanding of the System gradually progresses, the sceptics will come to realise the benefits, as will everyone else.

Once all these hurdles have been overcome and the wrinkles ironed out, the process of Certification is far from being the 'monster' many people fear.

Bearing in mind, however, the implementation, operation and maintenance of the System is designed primarily to demonstrate to your clients that the product they will receive has been produced in a controlled environment and that they can rely on it. Secondly, the System is documented in such a way as to describe fully, the Company operations and activities without imposing procedures that are not really viable.

Certification of the System reinforces the above to the extent that, not only does it comply with the ISO Quality Standard, it also complements the Company operations and activities effectively.

6. OPERATION & MAINTENANCE (O&M)

This is where the 'meat really gets put on the bone!' Although the System has been in operation for a period prior to Certification, it is by no means the end of the road; in fact, **'IT IS THE REAL START.'** Experience has shown that the Construction Industry in general, and Consultants in particular, tend towards the attitude 'we have achieved Certification, therefore the System will take care of itself.' A serious trap by which many Companies are ensnared until they realise the O&M of the System has to be constantly monitored.

The daily O&M of the System actually starts with the initial Inquiry, which is usually through a Director of the Company. He/She then would conduct negotiations with the interested Client to establish the scope and extent of the Project, Client requirements, schedule and, of course, the fee. Records of these negotiations are the beginning of the Project Quality Records. Once the Director and Client have agreed terms and conditions,

the Director appoints a suitable Project Manager who, in turn, selects the Project Team required to produce the end result in accordance with the Client's requirements. At this stage, a Contract Review is convened to ensure all aspects of the Project have been addressed, and resources are adequate to satisfactorily complete the Project. This Review should consist of the Project Director, Project Manager and a representative from each of the Support groups e.g. QA, Human Resources and Finance. Following this Review, the Project is allocated a sequential number which remains unique to that Project until final completion. (Final completion means when all documentation has been signed off and all accounts have been settled). A record of this Review is held in the Project and QA files.

The Project Manager now becomes the focal point for all Quality requirements with prime responsibility for the daily O&M of the System, as well as ensuring Project targets are met which satisfy the requirements of the Contract. This is not an easy task, therefore, selection is imperative. His/Her first duty following the Contract Review should be to produce a Project Quality Plan (PQP). This shall include a complete listing, by name and discipline, of the Project Team, identify personnel authorised to check documents, title and number of the Project, Client name, address and contact, scope, activities, start and finish target dates. It should also list Client employed Consultants and any Company Sub Consultants.

The Project Manager then has to ensure that all members of the Project Team understand their individual roles and responsibilities to the O&M of the Quality System. He/She is not entirely alone in this respect as the QA personnel are always available to assist and guide anyone through difficulties. However, the Project Manager shall always be the first contact for any matters, or communications, related to the Project, since he/she has to be aware, and control, all aspects of the Project. The other members of the Project Team, in whichever discipline or at whatever level, have to be fully supportive and know each amount of individual responsibility to the Quality System.

The Project Design Engineers are obviously the core element of the Project since they have the task of producing the drawings and other documents required to complete the Project. It is, however, sometimes overlooked that there is another key person on the Project i.e. the Project Secretary. The secretary performs many functions which are not always visible, but are indispensible to both the Project Manager and the Quality System e.g. receipt and registering of incoming communications, which then go direct to the Project Manager, irrespective of to whom they are addressed, registering and/or distribution of out going communications, filing of documents in accordance with the Quality Procedures in order that they can be easily retrieved.

The engineers also have a responsibility to ensure that the document/drawing they are currently working on is the latest version and that any superceded versions have been suitably destroyed, or marked and stored for contractual reasons.

The main point here is that everyone, at whatever level, has a responsibility to the Quality System.

Individual Consultancies have to determine how the System will be monitored, outside of that performed by the Project Manager. Depending on the size of the Company, it may be necessary to have a full time Quality Assurance staff. All over the world, anyone with a QA title is perceived as a 'spy' and they are out to get you! That could not be further from the truth. QA personnel, in any organisation, are there to advise, assist and listen on all aspects of the System. Yes, they conduct audits on a regular basis, however, it should be fully understood they are not there to find fault, the main purpose is to record conformity with the documented **System**, System being the operative word and **NOT PEOPLE!**

7. SUMMARY

There is no doubt whatsoever that I could further describe the daily O&M and monitoring of a Quality System as it applies to a Design Consultancy, however, that would probably run to book form.

Suffice to say, the adoption, implementation, operation and maintenance of a Quality Management System, Certified and satisfying the requirements of ISO 9001, will instill confidence in Clients, past, present and future, that your product is the best they can get, and also inspire workforce morale because they will have realised, due to the Quality System, effort has not been so intense.

Please note : Any opinions or inaccuracies expressed above are those of the author and are not attributable to Rust Asia Pacific Limited.

Paper No. 4

MANAGEMENT OF CHANGE AT CASTLE PEAK POWER STATION

Speakers : D. Powell, Station Manager, &
S.K. Wan, Maintenance Manager,
Castle Peak Power Station,
China Light & Power Co., Ltd.

MANAGEMENT OF CHANGE AT CASTLE PEAK POWER STATION

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ABSTRACT

In this paper, the management of changes at Castle Peak Power Station is presented and the background, change initiatives and achievements so far are described. Management of change is not an easy task, it requires a facilitator, a change agent and the involvement of people throughout the organisation.

BACKGROUND

In recent years, the standard of living of the people in the world has improved as technology advanced. The customers expect more for the money they spend. In order to survive in the market, entrepreneurs need to improve the performance of their companies to meet the requirements of their customers. In the past decades, most governments set up public utilities such as power stations to provide a stable and consistent services to their citizens. But nowadays, people want not only good services but value for money. Therefore, public utilities need to change according to this universal trend. Power stations are no exception.

In many parts of the world, public utilities are undergoing privatization and are changing their culture from being focused solely on providing a service, to being a profitable business providing a service to meet the needs of the customers.

Since 1979, the Government of the UK has transferred many public utilities into private ownership. Formerly, they may have viewed competition from a narrow perspective, considering tariffs and services as their objectives, but after being privatized, they could no longer receive support from the government and had to change their former operations and management systems to fulfill the challenges of being competitive. This involved minimising costs and maximising profit so as to satisfy their customers and their shareholders. In what ways the changes could be carried out, how improvements could be achieved and how to maintain the morale of the workers were but a few of the challenges of the process.

Another popular change which has been undertaken by many public utilities, especially in the United States, is that of Deregulation. So far, the momentum for utility deregulation has been from the Federal Government, to introduce deregulation of bulk power generation. The programme basically includes :-

1. Adopting procedures to minimize the cost of production and changes and hence to lessen the burden on the customer.
2. Putting the returns to shareholders and customers as equal requirements.

From the foregoing changes in the UK & US, it is apparent that management changes in the quest for continuous improvement, is the major aim of the power generation industry and other utilities worldwide.

In Hong Kong, as 1997 is getting closer, political uncertainties about the future have created a wave of emigration that is draining the labour market of talented resources. Entrepreneurs have started moving their factories into Mainland China to reduce production and labour costs. Today, because of its geographical position and advanced communication facilities, Hong Kong has become an international business and financial centre. The emphasis on quick turnover and increase in customers' expectations makes the business environment in Hong Kong more competitive. This challenge of competition is an issue which China Light & Power Co., Ltd. (CLP) is addressing.

The electricity in Hong Kong is generated, transmitted

and distributed by two public utilities. CLP is an Electricity Supply Utility providing power to the Kowloon Peninsula and the New Territories of Hong Kong and the Guangdong Province of the People's Republic of China. In Kowloon and New Territories alone, there are over 1,600,000 consumers in a densely loaded service area of 1,000 square kilometres.

CLP has currently a total installed capacity of about 6,500 MW, comprising 4,108 MW of coal fired steam plant, 1,520 MW of oil fired steam plant and 810 MW of industrial gas turbines. A gas-fired power station is now under construction and will have eight units with a total capacity of 2,500 MW. In addition, 70% of output from the Nuclear Plant at Daya Bay is supplying the CLP system.

Since 1963, the financial operations of the Company and its associated generating companies has been subject to a Scheme of Control monitored and controlled by the HK Government.

There was a rapid growth in electricity demand over the last decade and this justified the building of new power generating facilities. However, since 1993 the demand pattern has changed and the growth rate has slowed down. Manufacturing sales are declining due to the continued migration of factories to the People's Republic of China.

Also, the domestic sector records only moderate increases in electricity demand. The only area which maintains the high growth in electricity consumption is the commercial sector.

Following the commissioning of additional generating facilities at the Nuclear Power Plant at Daya Bay, the availability of hydro generation in Guangdong Province and China's economy overheating, sales to China have declined. Because of this change in electricity demand, the generation output of the power plant is affected, and this includes Castle Peak Power Station.

Castle Peak Power Station is the largest single coal/oil fired Power Station in the world. It possesses a generating capacity of 4,500 megaWatts with approximately 950 employees.

To meet the environmental changes, customers' and shareholders' requirements and to address the foregoing challenges, a change programme is being implemented at Castle Peak Power Station.

MANAGEMENT OF CHANGE AT CASTLE PEAK POWER STATION (CPPS)

CLP and CPPS like many other industries in Hong Kong and Southern China are continually striving to become more competitive by reducing costs, both labour and materials, and by improving productivity. The need for change is obvious from the foregoing but the following are a number of key factors :-

(i) A reduction in the rate of increase of electricity sales within Hong Kong,

(ii) Increasing competition in electricity supply from Southern China due to the installation of new generating plant in the PRC.

(iii) Reduction in sales to China for economic reasons within the PRC.

(iv) The continual introduction of new technology e.g. the Combined Cycle Gas Turbine (CCGT) coming on stream at Black Point Power Station.

(v) 1997 & its implications

(vi) Political reasons

This can all be summed up by one word, COMPETITION.

In introducing our Change Programme we are restructuring, empowering our staff, increasing business awareness, widening our people skills base, investing in information technology, rewarding improved performance, ensuring continuous improvement through bench marking, team working activity groups and zero base analysis.

Innovation, determination and flexibility are important factors in achieving this and sound strategies and techniques are needed to make progress. There is a need for the organisation to adopt a flexible approach which blends a necessary amount of dynamism with a pragmatic recognition of some inertia within the organisation.

Fundamental to the formulation of an effective

strategy is a clear understanding of the objectives and working culture of our business unit; e.g. safety, technical complexity, cost, man management, and the environment.

In order to consolidate all the change initiatives and to ensure the changes are implemented to programme and meet our objectives, a Change Action Team has been formed with representatives from various internal business groups within CPPS.

To date, a number of Management Changes have been implemented and these initiatives are described in the following pages.

PROFIT CENTRE

Staff at CPPS have moved away from a Cost Centre concept of just managing budgets, to Profit Centre management. At the core of this is a Trading Account (somewhat similar to a Profit and Loss Account) and this is shared with the staff so they understand the objectives of the business. The trading account classifies financial data by defining income and areas of cost so that managers and staff can manage costs under their control. It is a useful tool for making sound business decisions and driving down costs particularly in the areas of operation and maintenance. The Trading Account identifies the income from sales of electricity and itemises costs, e.g. fuel, salaries, core operation, maintenance, consumption of commodities, and administrative costs and finally shows the bottom line achievement for the period i.e. the profit, something everybody understands.

RE-ORGANISATION / RESTRUCTURING

Flattened Structure

There are, in fact, two power stations at Castle Peak Site, namely Castle Peak 'A' and Castle Peak 'B'. However, a re-organisation took place in October, 1993 and the two power stations merged to form one station. Before re-organisation, each Power Station had an independent management, manpower and material resources allocation, with a traditional hierarchical organisational structure. It ranged from the manager down to the lowest level through ten layers, these being the Station Manager, Superintendents, Senior Engineers, First Engineers, Second Engineers, Third Engineers, General Assistant Engineers, Technicians, Foremen, Secretaries, Clerical staff and Industrial staff who included Chargehands, Senior Fitters, Fitters and Apprentices. Each position carried an unique job specification and the role and function of each post in the organisation were well defined.

However, the world is ever-changing and so to are the customers' expectations in Hong Kong. Management decided that organisational changes were essential and reorganisation and cultural changes commenced in October, 1993. The first task was to merge the two Power Stations into a single management unit by combining the management teams, (the management posts were reduced by half). Also, the traditional hierarchical structure was replaced by a flattened structure of four levels. It composes of First and Second Tier Managers, Third Tier Team Leaders and Fourth Tier Team Members.

Team Building and Business Units

The team concept has been introduced and widely accepted. Team leaders are selected based on 'the right man to do the right job'. The traditional practice in employing First Engineers to head the Parish areas has been discouraged. Instead, team leaders are appointed based on the team responsibilities and work nature. Employees at a less senior level can be selected as team leaders so that their contribution can be recognised and they can be given a wider exposure which is beneficial to their career development. Under the team concept, team members are of the same level in the structure, being the fourth tier, and consist of engineers, supervisors and industrial staff. Each are encouraged to contribute their ideas and opinions freely to develop a team spirit and to make decisions in problem solving. Thus, the job satisfaction is enhanced and this improves morale.

In the past, each Power Station was set up with various branches, namely the Operations, Maintenance, Resources Planning, Technical Services and Development, Training and Administration. In each branch, it was further sub-divided into sections. Thus the Maintenance Branch was separated into three main sections namely Electrical, Mechanical and Control and Instrumentation. Each maintenance section was responsible for the maintenance of the plant and

equipment installed throughout the Power Station under their respective disciplines.

Following re-organisation, each section became a business unit, formed by process rather than of by discipline. The operational management of the Station is now under four main processes, these being Materials Handling, Steam Generation, Mechanical Power Generation and Electrical Power Generation. On the maintenance side, each business unit is now operating in a multi-discipline environment. For example, the Electrical Power Generation Unit, which is principally electrical maintenance has mechanical and instrument support staff attached to create a self-contained business unit. The main reason for this is to eliminate the 'waiting time for personnel of other trades to arrive' to repair an item of plant.

On the other hand, shift maintenance staff are now working within the Production Unit whose main duty involves both operation of the plant and first line maintenance. This practice has streamlined the production process and improved productivity and flexibility.

DEVOLUTION / EMPOWERMENT

The staff members have been empowered to make decisions and have the formal authority to execute their work. The waiting time for approval from the manager or supervisor and the distortion in communication can be minimized. As a result, the work process time can be shortened with higher accuracy. By delegating authority to lower levels to tackle or shoulder more important issues makes staff feel that working in the organisation is more rewarding and meaningful. The staff begin to demonstrate new qualities of responsibility, commitment and motivation. They become bigger people with wider horizons and this exposure is beneficial to both the Company and career development of the employee.

Currently, team leaders are further empowered to prepare and monitor their budgets and control the expenditure for their own teams. They are also authorized to approve leave applications, control holidays, attendance and other administrative issues.

RELIABILITY CENTERED MAINTENANCE (RCM)

The Background and History

Over the past two decades, maintenance philosophy has changed due to a huge increase in the number and variety of physical assets with more complex designs. Maintenance has also had to respond to changing expectations. These include a rapidly growing awareness of the extent to which equipment failure affects safety, productivity, production cost and the environment. An enhanced awareness now exists of the connection between maintenance and product quality, and the need to achieve high plant availability and reduce costs.

In 1981, Castle Peak Power Station maintenance departments adopted a traditional approach and introduced large scale preventive maintenance schemes. The initial setting up of this scheme was based on manufacturer's recommended maintenance schedules and the experience gained through power station practice from our engineers.

Maintenance personnel were dedicated to identifying a realistic and effective maintenance schedule by undergoing a constant review of the maintenance cycle. This was supported by our station's maintenance information system which contained historical data. All these efforts were for the establishment of a maintenance strategy aiming to maintain a high degree of plant availability and plant security without due regard for maintenance cost.

The maintenance strategy of simply reviewing the cycle frequency and work specification is not the best approach in meeting the Station's maintenance objective. The Station requires a structured format in its maintenance philosophy which addresses the safety, reliability and environmental issues without overlooking the operational security, performance and costs. Such a philosophy and strategy can be achieved by introducing techniques known as Reliability Centered Maintenance (RCM).

We recognised this need at Castle Peak and introduced the RCM concept in 1992. The concept is embodied in all of our Station's maintenance requirements and in all disciplines.

Implementing RCM at CPPS

In early 1992, courses were set up for Station staff to increase general awareness and to train facilitators.

In 1993 it was decided to take up RCM for all Station major plant systems. This was a very wide and intensive work programme for the RCM facilitators. Since then, more facilitators and staff have been trained to undertake this major project. Team members are selected for projects, based on their experience in the plant systems. Members of the project are usually from different disciplines and are able to contribute their experience and know how to the project. To date 56 of a total of 63 projects have been completed and updated maintenance schedules implemented. Implementation is ongoing and indications are that out of 9 systems completed there are cost savings approaching 50% with no deterioration in availability or performance.

MULTISKILLING

Multiskilling Concept at CPPS

At CPPS efforts are being made to reduce labour costs by, for example, reducing overtime working, eliminating labour supply contractors, eliminating unnecessary work, implementing RCM and operating a zero base policy for both manpower and budgets. Our major intention is to drive labour costs down even further but this can only be achieved by a fundamental change in the method of working. This requires a major commitment to in two areas - the first being to encourage staff to change the way they work and react to each other; and secondly to undertake significant and coordinated training programmes for many employees to allow them to acquire additional skills, and to work more flexibly on a wider skills base.

It is our intention to move to even greater multiskilled craft status with extensive training and/or recruitment of staff with multiple skills.

We do not see flexibility as a process of turning craftsmen or technicians into a 'person who can do all trades' (or everything) it is rather allowing and encouraging the employee to carry out specific additional tasks, to develop new skills and to work as part of a team with a single goal while maintaining the necessary standards. It means that the employee widens his horizon and expands his skills base. He must accept the possibilities of changes in his role and function.

In order to bring about these changes it is essential that good, two-way, communication is developed within the organisation. In addition, management have introduced the move to multiskilling by full explanation of the benefits, problems and possible job restructuring. If the workforce were not convinced that the proposed multiskilling initiative was not in their long-term best interests then the whole venture would probably fail.

All staff who are to be affected by the multiskilling move are individually counselled to determine personal ambitions, hopes and fears prior to the training or reorganisation before multiskilled operations start.

Scope of Multiskilling

Production and maintenance functions have traditionally been protective of 'their own domains' with production management only calling on maintenance staff when there is a plant problem. We are moving to "merge" production and maintenance tasks allowing, for example, production personnel to carry out some routine preventive maintenance tasks, and maintenance staff to become involved with production staff in joint efforts to improve production quality.

Traditionally, there are boundaries between the long established single-disciplined technology and staff who trained on a specific trade initially wish only to perform duties in that area.

Multiskilling initiatives have to be introduced gradually to ease away these barriers so that separate disciplines of key technological areas such as mechanical and electrical engineering merge. This can vary across the full spectrum of possibilities, from basic awareness levels to fully trained 'double' qualified mechanical/ electronic engineer. The degree of 'overlap' between electrical, or electronic or C&I and mechanical is determined by the planned tasks which the maintenance staff have to perform. For example, a 'core skilled' mechanical fitter who has 'grafted' onto his mechanical knowledge basic electrical skills, could carry out first line maintenance

tasks, handing over the more advanced diagnostic electrical problems to a fully trained electrical technician for second line tasks. However, if the problems lie in their core skill area the mechanical fitter would carry out both first and second line activities himself.

PROGRESS IN APPLICATION OF MULTISKILLING AT CPPS

In developing the multiskilling concept and practices for our workforce, pilot multiskilled training has commenced. Basic courses in mechanical fitting, metal machining, welding, rigging, manual lifting etc are provided to the electrical fitter whereas other courses such as electrical fitting, cable jointing and instrumentation are organised for mechanical tradesmen. The training is delivered by means of classroom training, on-job training and refresher training. To date, 15 basic skill-training modules have been organised and two batches of candidates have already undertaken the courses. These trained workmen were given opportunities to perform multiskilling duties when they were released from their training. With encouragement from managers and team leaders they are enjoying their new assignment and have encountered no obvious difficulties. It is agreed by Management that this cultural change must be extended to include supervisors and engineers.

COMMUNICATION

Communication is the process of exchanging information in a way that achieves mutual understanding between two or more people about work-related issues. From an organisational viewpoint, it is what we do as members of organisations to articulate plans, organise efforts, coordinate activities, and control progress. Greater productivity can be achieved through effective communication within an organisation.

In order to enhance downward communication, CPPS has introduced internal Team Briefing. Through this channel of communication, messages and information from First and Second Tier Managers can be communicated to the teams on such issues as business performance, safety, environment, plant performance, objectives etc.

For improvement in upward communication, the Station has established the Suggestion Box Scheme which encourage staff from all levels to express their own view in all matters related to the Station and Company. Their ideas will be studied and evaluated by the Change Action Team and who will suggest methods to be implemented for continuous improvement.

To achieve effective horizontal communication, peer managers, team leaders and team members are encouraged to share information between each others in an open manner. Discussions and meetings are essential to ensure coordination of activities and to avoid misunderstanding among employees so as to achieve the common targets for the Station. A Local Area Network has been installed throughout the Station and includes electronic mailing.

MANAGEMENT STYLE

Following the re-organisation and management changes, CPPS has moved away from the traditional bureaucratic and directive management into an open, sharing and listening style. Now, managers lead their business units by coaching and appreciating their subordinates' initiatives and contributions. Staff views and suggestions are encouraged and have been obtained via surveys and implementation in line with Station objectives in an ongoing exercise.

ACTIVITY BASED MANAGEMENT (ABM)

Activity Based Management is a decision-oriented approach to improve competitiveness and profitability. It includes service costing, profitability analysis, resource management, performance measurement and process re-engineering. ABM meets current business needs by helping managers to become more responsive by setting market-driven performance improvement targets; to meet customer needs better by improving the work that really adds value; to streamline work processes; to reduce waste and unused capacity; and to create a culture in which

all employees are motivated and able to contribute towards improvement.

A pilot project in Material Handling at CPPS has been undertaken with the assistance from an outside consultant and recommendations implemented. This has resulted in optimising manning levels to match the work load.

SAFETY MANAGEMENT

Safety of personnel and plant is high on our agenda and has always been a major priority at CPPS. At present, the Station is, as are other departments within the Company, audited under the Five Star Health and Safety Management System by an external international organisation. As a result of a major safety campaign on site and the commitment of the staff, the Station has achieved "Five-Star" grading recently. This is a world-class standard.

We have recently introduced a safety incentive scheme to enhance the safety awareness of the staff by setting up prizes for achieving 100 days without a loss-time accident. With the contribution of all employees, CPPS has successfully achieved this record and the Station is now aiming at 200 days accident-free.

A safe workforce and workplace is all about attitude and culture. Safety starts at the top i.e. senior management.

RISK MANAGEMENT

Within CPPS there is an increased awareness of the need to manage safety and indeed risks of all kinds, to people, plant and equipment, environment and business, in an all-encompassing manner. The approach is proactive and widening out from being concerned mainly with risk assessment, and there is a general recognition of the importance of the whole risk management process. This, it is believed, will result in a more balanced approach to safety, giving greater robustness and at the same time a more cost-effective approach overall. As a result, overall business performance can be improved without jeopardising safety.

Hazard and operability (HAZOP) studies have been undertaken on systems with potential hazards and recommendations for modification to plant together with improvement in both operation instructions and maintenance procedures have been identified. Implementation on all HAZOP projects is being pursued vigorously

ENVIRONMENTAL MANAGEMENT

In recognition of the environmental effects due to Power Generation and the growing importance of managing them effectively, CLP has developed a Corporate Environmental Management System (EMS).

A CLP Company Environmental Statement was issued and accompanied by 10 Environmental Principles, which included: complying with all legislation, identifying and quantifying all emissions and pollutants, conserving raw materials and improving staff environmental awareness.

To meet the Corporate requirements CPPS has begun to formalise and co-ordinate its own Environmental Management System.

It is the policy of Castle Peak Power Station to manage the business and to implement and support activities consistent with the China Light and Power Company Ltd. Environmental Statement.

In line with Corporate requirements CPPS recognises that compliance with its Pollution Control Licences is a key management issue. Systems, procedures and an Environment and Audits Team have been developed to meet the requirements of the Air and Water Pollution Control Licences and Chemical Waste Code of Practice. They will continue to be enhanced to improve the Station's environmental performance aiming consistently achieve full compliance.

As part of the EMS, CPPS has identified its significant environmental effects in a register and will implement systems and procedures to manage them where they do not already exist. Also, as a means to improve the Station's performance, an Environmental Improvement Plan will be produced annually and environmental audits carried out.

Commitment, adaptability, innovation and accepting responsibility for environmental management are crucial for the EMS to succeed. CPPS is committed to improving the environmental awareness and understanding of its staff and will provide feedback on their environmental performance, encouraging them to uphold the best environmental practices.

OPERATIONS INTEGRITY MANAGEMENT SYSTEM (OIMS)

The requirement of OIMS is to ensure that management systems are in place to manage every kind of risk and provide a proactive response. OIMS is intended to be an integral part of the day-to-day business of the Power Station. It is a disciplined and systematic process which initially identifies the requirements for procedures and practices, establishes and implements and then improves by the process of continuous assessment. OIMS addresses all aspects of our operations, and aims at preventing incidents by reducing risks in all areas of safety, health and environment.

OIMS is based on elements which state broadly the key aspects of a safe and environmentally sound operation. Expectations within the elements define more specifically what is expected of an operation to avoid incidents. Within OIMS there are eleven elements and sixty expectations.

OIMS involves all personnel on site, including CPPS employees, contractors, all visitors (in whatever capacity) and the community members and customers outside of the Power Station. OIMS is a personal and organisation-wide commitment which is absolutely essential to maintaining CPPS in a safe, productive and environmentally sound state with full consideration given to the people and environment in the community at large.

Implementation of OIMS at CPPS is ongoing and well advanced.

INFORMATION TECHNOLOGY

Background

Development of Information Technology systems of CPPS is ongoing. An adequate system is essential if our change programme is going to succeed. Advances in computer and communication technologies which can simplify our information has become a matter of strategic importance.

Castle Peak Power Station recognised in 1992 that there should be an initiative to upgrade the ageing computer-based work management systems and to integrate the individual business unit and team Personal Computers (PC's) onto a common network to facilitate the free flow of information throughout to site.

Before attempting any implementation to achieve these aims, a series of studies were commissioned to thoroughly analyse existing work practices and flows. The resultant reports in addition advised on how to integrate disparate systems which had been developed over the preceding years, and to expand on the applications available to further promote information dissemination and better work flows so as contribute to improved business practices and a reduction in costs.

Present initiatives

A project has been implemented to provide a site-wide Local Area Network (LAN) onto which office automation has been applied to enhance communication between business units. 'B' Station plant data logger is connected to the LAN to give real time access to operational parameters. 'A' Station will be commissioning a new data logger shortly and this will also be connected to the network.

Various previously isolated computer-based systems are now accessible throughout the network. Two hundred personal computers are distributed throughout the site to service various business unit needs.

Two further major I.T. projects are now in progress. These are the provision of a modern Computerised Maintenance Management System (CMMS), and the electronic storage and management of all the 'key' station drawings and O&M documentation (DMS). These systems will be highly integrated together to enable seamless access between each.

The CMMS will provide enhanced features not presently available in the areas of accounting for job

manpower and spare parts costing and analysis, job scheduling, job/plant history. It will be integrated with the DMS and other systems to draw data from, and contribute to them.

The DMS will place all regularly used drawings and O&M procedures, instructions etc into electronic formats which will be accessible from any computer terminal on the network. This will overcome the problems of having many copies of documentation in circulation and possibly out of date. There will be one repository of definative information for the Power Station.

As part of the new systems, the Station is considering introducing Bar Coding of asset tracking and various other functions associated with work management. This can assist staff in the identification of plant and greatly improve defect maintenance, spares ordering, etc.

Also the use of a portable A4 electronic notebook is being studied with respect to their use on work management systems to enable work teams carry all O&M information and drawings related to their work schedule with them to the job site. They can also report back via the notebook computer, the work reporting for direct uplifting back into the CMMS with this technology.

Improved systems at CPPS, so far, has led to improvement in operational efficiency, better productivity and cost reductions.

On-line dynamic information accessibility and flow will facilitate timely and correct decisions being taken in the management of the business. The information provided will expedite the deployment of resources and assets and promote opportunities to refine cost control, budgeting and cost reductions.

PERFORMANCE MEASUREMENT SYSTEM

Performance Management is a process for improving organisational and individual effectiveness. To be effective means that everyone needs to understand business objectives, and how their activities contribute to achieving those objectives. It means that everyone must understand what is expected of them in terms of results to be achieved and specific behaviours to achieve them. And it means that everyone needs to receive feedback about how they are performing against what is expected.

In these times of extreme-economic competition, CLP has to adopt a customer-responsive approach in providing a reliable supply of electricity to the community at the most economical cost in line with quality services and safety standards both to the public and its employees as whole.

This new approach calls upon a new organisational structure at CPPS with a greater emphasis on teamwork which fosters greater fulfillment, responsibility and commitment, increased productivity and improvement in customer services.

To achieve these objectives, a continuous monitoring mechanism entitled, PERFORMANCE MANAGEMENT SYSTEM, has been introduced at CPPS to assist teams and team members to identify areas of improvement and determine targets to meet the customer needs. It emphasizes productivity, safety awareness and customer satisfaction. Continuous improvement which stems from teamwork will create the impetus to drive Castle Peak Power Station ahead of its competitors.

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Alongside with this measurement for team performance, we have just completed performance appraisals for individuals based on 12 Competencies. The Performance Management System will further develop to include setting targets and objectives for departments, business units, teams and individuals.

CONCLUSION

Castle Peak Power Station has spent considerable effort over the past two years in implementing management changes. Our achievement can be demonstrated with a variety of benefits already seen, such as improved productivity, increased business and environmental awareness and reduced operating costs while maintaining the required safety standards, plant availability and performance.

With the introduction of the profit centre and trading account concept, the Station staff have acquired the correct tools to manage their business and make sound

decisions. The flattening of the organisational structure and open style management is eliminating bureaucracy, improving communication and enhancing cooperation among the staff. Following team building and implementation of team work concept, staff at all levels are encouraged to make positive contribution towards achieving a common goal. The single-disciplined workforce has changed their traditional practice into a multi-skilled one. Empowerment of staff members has improved job satisfaction and increased overall productivity.

The maintenance strategy is enhanced by the RCM concept to eliminate unnecessary routines so as to reduce maintenance cost. Safety and environment awareness remain high priority on the agenda of Station activities. This is reinforced by implementing comprehensive systems on safety, risk, OIMS and environmental management around the Station.

Development of information technology can expedite the deployment of resources and achieve easy access to day-to-day information.

Management of change is not an easy task. It requires a facilitator, a change agent which is the Change Action Team at CPPS, and also proactive people for its implementation. Finally, it requires cooperation and commitment from all staff for its success and continuous improvement.

Paper No. 5

RE-ENGINEERING PROJECT EXPERIENCE IN THE DISTRIBUTION AND CUSTOMER SERVICES GROUP

Speakers : C.H. Cheung, District Manager,
Leslie Y.S. Au, District Manager, &
Langston L.T. Yung, Accountant,
China Light & Power Co., Ltd.

RE-ENGINEERING PROJECT EXPERIENCE IN THE DISTRIBUTION AND CUSTOMER SERVICES GROUP

C.H. Cheung, District Manager,
Leslie Y.S. Au, District Manager,
Langston. L.T.Yung, Accountant,
China Light & Power Co., Ltd.

ABSTRACT

The Distribution and Customer Services Business Group of China Light and Power Co. Ltd has started a dedicated journey of key business process re-engineering by radically redesigning selected processes to improve services to customers and to meet future challenges. The business processes selected for undergoing re-engineering include 'Electricity Supply Restoration', 'Electricity Supply Application' and 'Billing'. Each project brief will cover project benefits, key proposals, cost/benefit analysis and implementation plan. Apart from the end product, the experience of process re-engineering was shared covering the areas of quality management,team breakthrough, technology support, communication and use of the consultant.

1. INTRODUCTION

Against a background of rapid political, social, economical, technological and customer expectation changes, the Distribution and Customer Services Business Group of China Light and Power Co. Ltd has started a number of initiatives such as international benchmarking, peer utility appraisal, best practices, cultural change seminars, competency based management, local customer advisory committees, customer feedback cards and business process re-engineering etc. to improve services and to meet future challenges. The Distribution And Customer Services Business Group has adopted the vision to 'Deliver Absolute Customer Satisfaction' to the customers.

2. ORGANIZATION FOR RE-ENGINEERING

After the appointment of the consultant, training of department heads and the senior managers was conducted. The Steering Committee was set up to select three key processes and steer the projects. Three design teams were formed each with a process 'owner'. Training was given by the consultant for all team members. The teams were given challenging targets and were tasked to radically redesign the processes. They were steered by regular Steering Committee meetings. After refinement and acceptance of the re-design, implementation teams were formed to materialize the proposals. The organization processes selected and work programmes are as shown in diagrams 1,2, and 3.

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Currently, three implementation teams are overseeing the progress of the three redesigned processes which are:-

- Electricity Supply Restoration
- Electricity Supply Application
- Billing

3. RE-ENGINEERING THE EMERGENCY SERVICES PROCESS

3.1 Project benefits

We aim to delight customers by fast telephone response, fast arrival, and fast

supply restoration. We provide extra care to customers for the emergency services process from the moment the customers telephone us to satisfactory restoration of electricity supply. For instance, we aim to improve our arrival-on-site time and reduce the average electricity restoration time.

3.2 Major proposals

- Manpower resources are grouped and positioned strategically within the districts with respect to time and location to match fault patterns and shorten travelling distances.
- A central core team of engineers with strong technical and work site knowledge is posted in the Customer Telephone Services Centre to address customer needs, co-ordinate and mobilize resources across districts to the areas in need to monitor and improve services standards.
- In each shift, an engineer in the district emergency services team is empowered to make fast site decisions without hand-offs even for complicated faults at high voltages.
- A 'Trouble Call System' has been established to provide expert and real-time field data via wireless fascimile and handheld portable computers for fast response and decisions.
- Alternative methods to speed up restoration by reclosures, temporary connection (standard kits) and low-noise generators have been established.
- Contingency plans and support systems for field operations have been established for different fault scenarios for peak workload.
- Customer needs in the areas of information and fault isolation have been addressed so that extra care can be extended to them as far as permissible.

3.3 Cost and benefit analysis

The payback period is two years.

3.4 Implementation

An implementation team has been formed to oversee the project which is expected to be completed in 1996. (Please see programme)

4. RE-ENGINEERING THE ELECTRICITY SUPPLY APPLICATION PROCESS

4.1 Project benefits

We aim to delight customers by providing fast, accurate, minimum cost and convenient services across the spectrum of supply provision processes. The processes cover temporary supply, new supply, change of name, termination of accounts and requests for diversions.

4.2 Major breakthrough proposals

- By using electronic links between developers and the Company, the deposit payment, application for electricity supply for multi-storey flats, and refunds to developers are greatly simplified, mutually benefiting the customers, developers and the Company.
- By facilitating applications by telephone and enhancing our computer support system for all

customers, many hand-offs and much waiting time can be eliminated.

- Unless there is alteration of fixed electrical installations, change of load, house demolition or re-decoration, there will not be termination of electricity supply upon request of termination of account. With the elimination of the engineering process, this will only be an administrative and accounting process which can facilitate applications by telephone.

- The cycle time for engineering work can be drastically reduced by allowing developers to design their substations (subject to our approval), by proactive planning, programming and work execution, by multifunction and multiskilled engineers and workers, and using the team approach to projects.

4.3 Cost benefit analysis

The payback period is less than one year.

4.4 Implementation

An implementation team has been formed to oversee the project which is expected to be completed in 1996. (Please see programme)

5. RE-ENGINEERING THE BILLING PROCESS

5.1 Project benefits

We aim to delight customers by providing cost-effective, simple, convenient, speedy and caring services throughout the whole billing cycle. The cycle covers accepting deposits, sending bills, collecting payment and refund of deposits.

5.2 Major breakthrough proposals

- By accumulating the deposit interest instead of paying it back to the customers, this will eliminate the nuisance of asking for additional deposits or carrying out the associated disconnections.

- By real time automating of the work programme and adopting meter reading with projections, the operation will be much more cost-effective and efficient.

- By using programmable polyphase meters for bulk and large power tariff accounts, meter readers only need to capture the reading by a scanner. This will eliminate taking photos of the Maximium Demand Indicators for cross checking. Not only will errors be reduced, but double handling will also be eliminated thus expediting the delivery process.

- By proper empowerment of customer service personnel and information technology support, refunding of deposits and responding to back charge enquiries can be handled in a one-stop-shop manner on the spot.

- By extending our customer services functions in our cash offices, we can provide more outlets. More self-services terminals will be installed to provide round-the-clock services for payment, enquiries, service requests, etc.

- Mobile customer service teams using wireless self-service terminals and video programmes will be on the road to serve customers and promote our

facilities in various parts of our supply area, thus keeping a close contact.

5.3 Cost and benefit analysis

The payback period is less than one year.

5.4 Implementation

An implementation team using some design team members has, been formed to oversee the project and implement the recommendations in phases. The project is expected to be completed in 1997.

6. EXPERIENCE GAINED

6.1 Quality Management

The Company has embarked on total quality management. This has laid a firm foundation for re-engineering. Quality circles and re-engineering implementation teams worked hand in hand to push performance to higher levels. The Steering Committee poses challenging goals and questions to the teams to refine their proposals to avoid potential pitfalls. The selection of the right people also reduces the probability of failure.

6.2 Team breakthrough

We are able to achieve team breakthrough by proper team building and creating a good climate to facilitate teamwork with the following salient features:-

1) common goal
2) specific targets
3) right number
4) group accountability
5) right members
6) complementary team roles
7) emphasis on both task and maintenance behaviour

The teams operate with minimum interference and achieve both team breakthroughs in task performance and individual breakthroughs in personal development. The team members constantly challenge assumptions, conventional systems and each other's ideas. Peer visits also helped to generate more options and breakthroughs.

6.3 Technology

All teams found that information technology is a vital enabler for the projects. For implementation, the measurement of progress invariably requires data and analysis using the computer. Engineering support also is vital.

6.4 Communications

To breakdown resistance to change, the basic rule is to communicate, communicate and communicate.

6.5 Role of consultant

The use of a local and Chinese-speaking consultant facilitating without dominating is definitely an asset. Their contribution is particularly valuable in training, process review and strategic planning.

7. CONCLUSION

The Distribution and Customer Services Business Group of China Light and Power Co.,

Ltd. has started a dedicated journey of key business process re-engineering by radically redesigning selected processes to improve customer services. The business processes selected include 'Electricity Supply Restoration', 'Electricity Supply Application' and 'Billing'. By reviewing current practices and challenging existing assumptions, we have identified root causes for rework, hand-offs and delays etc affecting further improvements and we have radically redesign our processes to raise the quality, time and cost standards to new horizons.

Our experience in re-engineering so far convinces us that there is much potential for dramatic improvement in many of the business processes in the Company. We see a dual task in front of us: First, we want to make sure that the recommendations we have prepared for the three re-engineered processes will be implemented fully. Secondly, we want to embark on the next round of re-engineering projects to achieve further dramatic breakthroughs.

Diagram 1 - Organization

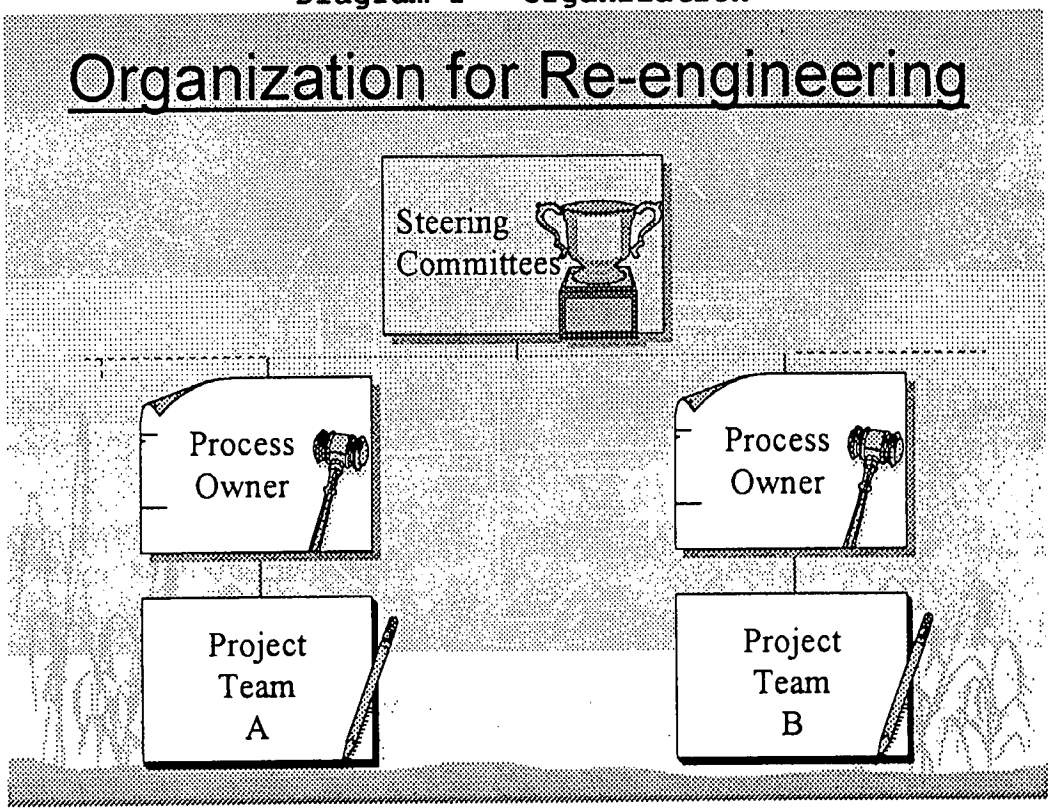


Diagram 2 - Processes

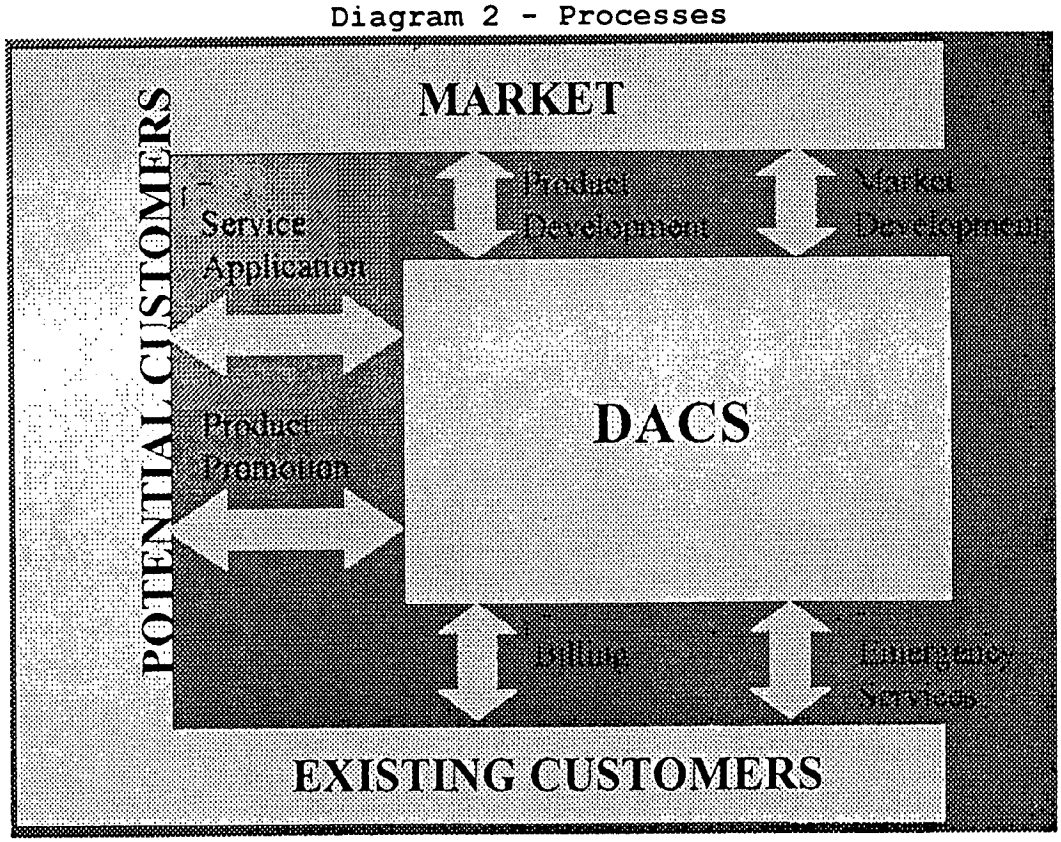
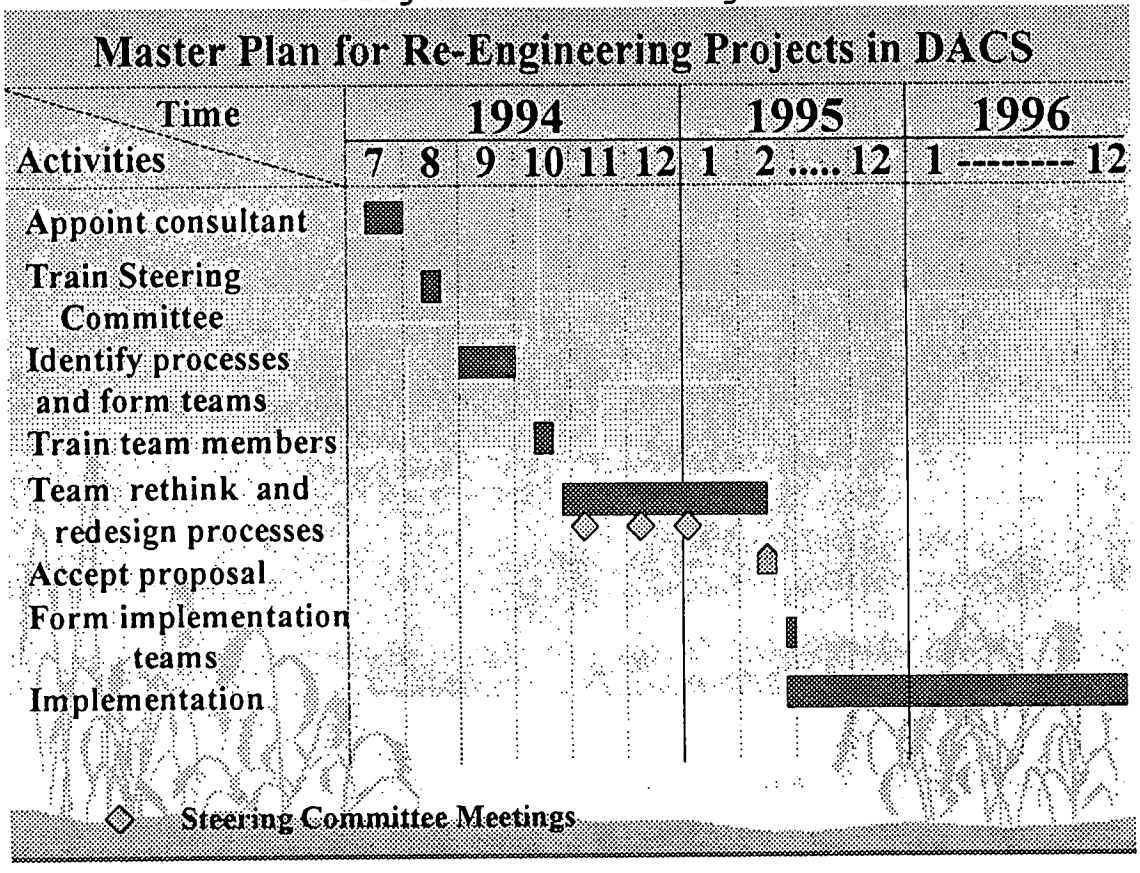


Diagram 3 - Work Programme



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Paper No. 6

BUSINESS RE-ENGINEERING: THE DRAMATIC SEARCH FOR QUALITY

Speaker : K K Tse
Managing Director,
K K Tse & Associates

BUSINESS RE-ENGINEERING: THE DRAMATIC SEARCH FOR QUALITY

K K Tse
Managing Director,
K K Tse & Associates

ABSTRACT

Business Re-engineering builds on and goes beyond Total Quality Management in effecting major transformation in business organizations. This paper captures the essence of business re-engineering and identifies the challenges for organizations embarking on business re-engineering. The paper also attempts to identify the major trends in Hong Kong with respect to the types of organizations that will be undertaking re-engineering and the key factors for success and failure. The paper ends with an exploration of the prospects of re-engineering success for joint-venture and state-owned enterprises inside China.

INTRODUCTION

The following quotes from leading experts provides the best introduction to the subject of re-engineering:

"Re-engineering is new, and it has to be done"

- Peter Drucker

"Re-engineering will be the compass and map for the 21st Century business world."

- John Sculley

"Business re-engineering does not sound revolutionary, but it is."

- Charles Handy

"While implementing re-engineering is not easy, there is no choice. The future will belong to companies that succeed at re-engineering."

- Michael Hammer

"Business Process Re-engineering isn't just another management fad; it's here today, tomorrow, and forever."

- John Byrue

'Fast-growing Asian and Latin American countries may make a better job of re-engineering than Europe."

- The Economist

BUSINESS RE-ENGINEERING: INTERNATIONAL PERSPECTIVE

According to a nine-month research project undertaken by CSC Index, a major management consulting firm specializing in re-engineering, the state of re-engineering in North America and Europe exhibits the following features:

- Re-engineering has spread like wildfire.
- Effective project management (by the re-engineering teams) and senior executive commitment are, by far, the two biggest success factors in re-engineering.
- Corporate cultures are often inhospitable but not necessarily fatal to re-engineering.
- High ambition in re-engineering reaps high rewards.
- Key re-engineering drivers are: customers, competitors, and costs.
- No more than 25% of re-engineering initiatives fail.
- Many re-engineering initiatives are in areas close to the customer.
- Deciding what to re-engineer is not difficult for most companies.
- Re-engineering is shaking up the workplace.
- The most difficult aspect of re-engineering: dealing with fear and anxiety throughout the organization.

The same report highlights the following as the most

common re-engineering goals among the companies surveyed:

1. Cost reduction
2. Productivity improvement
3. Cycle-time reduction
4. Customer satisfaction enhancement
5. Quality improvement
6. Increase in revenue
7. Increase in market share

The most likely changes in management systems and structures after re-engineering are:

1. Managers becoming more like coaches than supervisors.
2. Rewards for adding value, not rank or long service.
3. Continuous education for a changing environment.
4. Managers recruited for their ability to learn.
5. Fewer checks and control steps.
6. Less hierarchical organization structure.
7. Fewer functional departments.
8. Incentives for teams rather than for individuals.

BUSINESS RE-ENGINEERING: HONG KONG PERSPECTIVE

Total Quality Management is not new. Re-engineering is not new. What is new is the specific relationship between the two.

Newness is of course relative. They are relatively new in the West: TQM as a concept has become popular only in the last ten years or so, and re-engineering, about five years.

In Hong Kong, both concepts are new. But both are catching on very rapidly. Hong Kong is also benefiting from the so-called "late development effect", that is, learning from both the positive and negative experience of the early starters in the West.

TQM may be defined as **the integrated corporate effort to create and sustain a distinct competitive edge by focusing on the customer to meet and exceed their expectations better than the competition through harnessing the leadership potential, creativity and continuous improvement effort of all levels of staff in the organization.**

Re-engineering, on the other hand, refers to **the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical measures of performance such as: cost, quality, service and speed.**

In the West, some people are talking about re-engineering as a post-TQM focus. In Hong Kong, TQM has hardly taken root. It is more appropriate to see re-engineering as part of TQM in the Hong Kong context. Indeed, in all of our consultancy work with local companies, the two just go hand in hand.

Nevertheless, re-engineering requires a fundamental shift in paradigm for most organizations and individuals. To achieve this is precisely the challenge for all organizations embarking on this two-in-one strategy of TQM and Re-engineering.

KEY CONCEPTS OF TQM

Let us first of all recap the key concepts of total quality.

A good reference point is the U.S. Malcolm Baldrige National Quality Award. The following concepts form the bases of assessment for this prestigious award:

- Quality is defined by the customer.
- The senior leadership of businesses needs to create clear quality values and build the values into the way the company operates.
- Quality excellence derives from well-designed and well-executed systems and processes.
- Continuous improvement must be part of the management of all systems and processes.
- Companies need to develop goals as well as strategic and operational plans to achieve quality leadership.
- Shortening the response time of all operations and processes of the company needs to be part of the quality improvement effort.

- Operations and decisions of the company need to be based on facts and data.
- All employees must be suitably trained and developed and involved in quality activities.
- Enhanced design quality and defect prevention should be major elements of the quality systems.
- Companies need to communicate quality requirements to suppliers and work to improve supplier quality performance.

FROM TOTAL QUALITY TO BUSINESS RE-ENGINEERING

If the above summary is indicative of the challenge of implementing total quality, it may be legitimate to raise the following questions:

- How many organizations have successfully implemented total quality?
- Should organizations first of all transform themselves through total quality before contemplating re-engineering?
- To what extent is total quality a prerequisite for re-engineering?
- Should organizations consider re-engineering if they have failed in total quality or not started it as yet?
- Can total quality and re-engineering be implemented at the same time?

To the extent that the senior management team of many organizations are being puzzled by these questions, management consultants are also repeatedly being bombarded with these queries.

The answer is, paradoxically, rather simple.

Here is how we see the dynamic relationship between total quality and business re-engineering:

- Although not too many organizations in Hong Kong have gone through the total quality phase, they have now no choice but to do both at the same time. They cannot afford to wait for a few years just to build the total quality foundation. It is feasible to integrate re-engineering into total quality.
- On the other hand, re-engineering can be undertaken and be productive only within a total quality framework. Re-engineering is instrumental in bringing about breakthrough results to sustain the overall total quality effort.
- Re-engineering is not an one-off exercise; reengineered process requires continuous improvement after it has been installed. The benefits of re-engineering are best sustained within a total quality environment.

A PARADIGM SHIFT

Nevertheless, re-engineering represents a paradigm shift as compared to continuous improvement in the total quality approach as can be seen from the following comparison:

	Continuous Improvement	Business Re-engineering
Assumption	Sound process	Unsound process
Essence	Problem-solving	Reinventing
Approach	Incremental	Radical
Style	Analytical	Creative
Focus	Micro	Macro
Goal	Enhancement	Stretch
Change	Limited	Holistic
Impact	Modest to major	Great and dramatic
I/T Role	Secondary	Fundamental
Implementation	Bottom-up	Top-down

SOME SPECTACULAR RESULTS

By effecting a shift in paradigm and driven by top management, organizations managed to achieve dramatic improvements in key business processes. Below are some well known examples:

- IBM Credit reduced the time to prepare a quote for buying or leasing a computer from seven days to four hours, while increasing the number of quotes prepared a hundred-fold.

- Federal Mogul, a billion-dollar auto parts manufacturer, reduced the time to develop a new part prototype from twenty weeks to 18 days, thereby quadrupling the likelihood of customer acceptance.
- Mutual Benefit Life, a large insurance company, halved the costs associated with its policy underwriting and insurance process.
- The U.S. Internal Revenue Service, through successful process innovation, collected 33% more dollars from delinquent taxpayers with half of its former staff and a third fewer branch offices.

RE-ENGINEERING: THE ASIAN WAY

The so-called Asian way represents not so much some special oriental ways of doing re-engineering but more of a modified approach to re-engineering given the unique combination of circumstances in the Asian business environment.

It is possible to identify at least five major elements in this approach:

1. No apparent pressure to downsize

Unlike many U.S. firms, there is generally not much pressure to downsize for most organizations in Asia. For some U.S. companies, there would be a significant reduction of headcount regardless of re-engineering. But most Asian organizations (as distinct from multinationals in Asia) undertaking re-engineering do not have staff reduction as their goal in re-engineering.

2. Special appeal to market leaders

In the U.S., it is often said that there are three types of companies which would do re-enigneering: 1) companies in deep trouble; 2) companies not yet in trouble but see it coming in a couple of years; and 3) companies in great shape but wanting to create a bigger gap between them and the competitors.

Although no hard statistics can be obtained on the actual proportion, it is widely believed that it could be something like 70:20:10 respectively in the early 1990s and changed to 50:30:20 in the last couple of years.

In Asia, to our knowledge, the situation is quite different. Organizations doing re-engineering are usually market leaders in their fields. They are usually doing very well financially, progressive in outlook, innovative in management approach and are among, or aspiring to be, world-class organizations.

This is hardly surprising, if only because it is usually the more successful and enterprising organizations which are attracted to new management practice.

In Hong Kong, for example, a pioneer in re-engineering has been China Light & Power Co. Ltd. In a virtual monopolistic position, they have been one of the bluest of the blue chips in the stock market and have been voted by Far Eastern Economic Review as one of the 'most admired' companies in Hong Kong.

Another case in point is the Hospital Authority which is probably the most progressive and best managed public body in Hong Kong. They began re-enigneering a few years ago and have now achieved the highest proportion of middle managers/professionals who can independently initiate and implement re-engineering projects among all organizations in Hong Kong.

Last but not the least, the example of the City University of Hong Kong is also instructive. As a polytechnic-turned university, the City University is a young institution but it is probably the best among all tertiary institutions in terms of leadership and management. Their effort in re-engineering is exemplary.

3. The human touch

Re-engineering in the West has got a very bad press partly because of the ruthlessness some organizations have demonstrated in their re-engineering effort. Apart from mass layoffs done under the banner or pretext of re-engineering, some organizations have also aggravated the tension, mistrust, and conflict between labour and management during or after re-engineering. Dealing with fear and uncertainty throughout the organization remains the foremost concern for most organizations planning or implementing re-engineering.

By contrast, most Asian organizations undergoing re-engineering seem to be adopting a more humane approach. In the first place, the level of trust between management and the workforce is generally much higher in Asia than in the West; and when we take into account the preceding point about market leadership, re-engineering in these organizations is generally proceeding in a more receptive and accommodating environment. Most staff involved in or affected by the re-engineering initiative tend to take it as an additional opportunity for personal development. The amount of fear, uncertainty and unrest is much lower than in the West.

4. A more solid TQM foundation

Among the more progressive Asian organizations, there is a greater chance that there is a more solid TQM foundation. Most of these organizations have had in place for some time some form of total quality management, or are at least highly quality conscious.

When we consider the so-called Four Pillars of TQM, namely, Leadership, Customer Focus, Continuous Improvement and Total Involvement, it is obvious that these provide a valuable platform from which to launch re-engineering.

Asian organizations which have excelled themselves in quality management can usually take up re-enigneering at a faster pace and be in a position to sustain the effort better than some Western organizations with weak TQM foundation.

5. A 21st Century Perspective

We have also observed that most Asian organizations undertaking re-enigneering do so with a longer view in mind - preparing themselves for the 21st Century. The implications of such a perspective are manifold.

First, these organizations are engaging in re-engineering as part of the overall effort to create a 21st Century organization.

Second, they are not hard pressed to produce short-term results.

Third, the re-engineering initiative is closely tied to the strategic vision of the organization.

Fourth, re-engineering is conceived as an important strategic weapon to leapfrog competition and redefine the industry.

Fifth, re-engineering is seem as an opportunity to develop 'intrapreneurs' in the organization to compete for the future.

While all these may not be distinctly Asian, it is nevertheless significant to note that so many Asian organizations currently undergoing re-engineering share this perspective. No wonder many Western observers are predicting that Asian organizations may do a better job at re-enigneering than their counterparts in the West.

CRITICAL SUCCESS FACTORS

From our experience working with various types of organizations in Hong Kong, the critical success factors for re-engineering are as follows:

1. Top management commitment and personal involvement.

2. A clear vision and strategy.
3. Communicating the vision and sense of urgency to staff.
4. Competitive pressure e.g. key competitors succeeding in re-engineering.
5. Project management of the re-engineering teams.
6. Strong information technology support.
7. Staff commitment and support.
8. A solid quality management foundation.
9. Good external assistance.
10. Pressure from above, e.g. board of directors, shareholders, etc.

MAJOR TRENDS

Hong Kong is a late-comer in re-engineering; but it is catching up very fast. The following trends are noticeable:

1. More and more organizations (business and otherwise) will be doing re-enigneering because of the pressure from customer expectations, competition, and accelerating costs.

2. We expect more local companies (as distinct from multinationals) to be undertaking re-engineering and will have a better chance of achieving success because of top management's direct involvement. (Top management of multinational companies are usually too remote to provide personal leadership.)

3. A high proportion of organizations which have succeeded in re-engineering will be willing to share their experience with other organizations.

4. Re-engineering mindsets and skills will soon become prerequisites for all executives.

5. Re-engineering experience will become a valuable item in an executive's CV.

6. There will be an influx of international consultants into Hong Kong but they will have to overcome the cultural hurdle in order to be effective.

7. Local Chinese consultants will play a key role in assisting organizations to undertake re-engineering in Hong Kong and inside China eventually.

8. Re-engineering will soon become a virtually free corporate programme because of the extremely high probability of pay-back in investment within a year.

9. Finally, as Michael Hammer puts it, "While implementing Re-engineering is not easy, there is no choice. The future will belong to companies that succeed at re-engineering."

RE-ENGINEERING IN CHINA?

There is absolutely no doubt that many Chinese enterprises both in Hong Kong and inside China can benefit from re-engineering. This is particularly so for enterprises inside China.

Re-engineering for Chinese enterprises would involve above all a complete re-education of the top management team. This is absolutely essential and is the sine qua non for re-engineering success. But this is advisable and highly desirable. Re-engineering may well be China's major driving force for enterprise reform.

But is this likely to happen? It is difficult to tell. But I would expect that if this is feasible inside China, it should first of all be practised by the Chinese state-owned enterprises in Hong Kong.

We often heard that Special Economic Zones are considered 'windows' to the outside world. They may well be. But what about the state-owned enterprises in Hong Kong? They operate beyond the 'windows' and should be in a much better position to learn and apply modern management approaches. But the fact remains that these enterprises have up to now been very slow in assimilating up-to-date management practices. We would expect some of these organizations to pick up re-engineering in the next few years and to the extent that they are successful in this venture, it would greatly facilitate enterprises inside China to learn and apply this powerful management transformation approach.

CONCLUDING REMARKS

Business re-engineering entails drastic organizational transformation and is not for the faint-hearted or half-hearted. It builds on but goes beyond Total Quality Management, and the two support and reinforce each other. Hong Kong companies have been slow in adopting both approaches, but the competitive pressure locally and from overseas will certainly accelerate their adoption by local organizations in the years to come.

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Paper No. 7

CHANGE OF SERVICE CULTURE ON THE KCR – A QUEST FOR EXCELLENCE

Speaker : Martin Brown
Head of Operations,
Kowloon - Canton Railway Corporation

CHANGE OF SERVICE CULTURE ON THE KCR – A QUEST FOR EXCELLENCE

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ABSTRACT

This paper will describe many of the recent initiatives on the Kowloon Canton Railway (KRC) to change our service culture as part of our continuing quest for excellence; why we are doing this; what is involved in practice, the results to date and our strategy for the future.

1. BACKGROUND

The KCR as we now know it, is just 12 years old.

The railway from Kowloon - Guangzhou, first opened in 1910, the British section was just over 34km from Kowloon to the border at Lo Wu with 9 stations. One of the original stations at Tai Po Market has been preserved by the Regional Council.

The line was originally worked with steam traction. Diesel was gradually introduced in 1955, and steam working ceased in 1962.

Passenger business and freight steadily increased over the years and by 1973/1974, the KCR was carrying 13 million passengers per year, including 1.5 million cross-border passengers, and 1.25 million tons of freight. The original railway was very different, mainly single line and passing loops, with about 12 trains per day in each direction. 1973 saw the start of modernization with some double tracking, reaching Beacon Hill Tunnel between Kowloon Tong and Tai Wai in 1975, and Tai Po Market in 1976. The Kowloon Terminus moved to Hung Hom in 1975.

The concept of a modern, double track, electrified railway meeting the transport needs of the developing New Territories was approved in 1978. Electrification reached Shatin in 1982 and Lo Wu on 15 July in 1983, just 12 years ago.

As part of the modernization, additional stations were provided at Kowloon Tong, Tai Wai, Fotan, Racecourse and Tai Wo which opened in 1989.

2. CREATION OF THE KOWLOON CANTON CORPORATION

In December 1982, when the modernization was almost finished, the KCR Corporation was created. This created an 'arms length' relationship, separating the operation of the railway from Government, and providing a sound framework for the future. The KCRC was also required by law, to operate on prudent commercial principles and although still owned by the Government was responsible for setting its own fares.

At the time the Corporation was created, the two key objectives were:-

- to complete the modernisation works.
- to operate the railway at a profit - without subsidy from the tax payer.

The KCRC has been very successful in achieving these:-

- The modernization was completed on time and within budget in 1983.
- The railway has been making a profit after interest and depreciation, since 1985.

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3. CUSTOMER ORIENTATION

We did not set out to change our service culture but to improve our business performance

We had always thought we were a customer oriented company, after all more than 600,000 passengers used our services every day.

Typical Passengers in million/Day of other Hong Kong Operators are: -

MTR - 2.2	KCR - 0.60
KMB - 3.0	LRT - 0.30
Taxi - 1.5	HK Tram - 0.30
CMB - 0.75	

However in 1989, it was obvious that all was not well. Public perception of KCRC was low, there had been a number of unwelcome incidents on the KCR and critical articles in the press. The new LRT service in Tuen Mun was not as well received as it should have been.

Looking back we can see that we were treating passengers as human cargo, the original colour scheme for Lo Wu Station and the platform queuing pens were good examples of this. As managers we were talking and writing about passengers only as numbers and statistics, throughputs and flow rates, 'Passenger per 15 minutes', '$ earnt per passenger carried', '$ spent per passenger carried' etc. etc. This had all developed from the original objectives, to modernize and make a profit.

We were concentrating on operating trains instead of carrying passengers.

In 1989, we started to look outside our own company and to see customers as individual people with needs and feelings. We were also aware of the MTR's Core Values of Customer Service, Respect for the individual, on time and within budget and the impact on both the MTR's staff and their service as perceived by their customers.

We could also see that previous 'smile campaigns', be nice to the customer, etc. didn't seem to have a lasting effect, and usually after a month or two we had reverted back to our old ways.

This in turn led to a fundamental rethink, of our business, our purpose and our objectives.

What were we trying to achieve?
Who were our customers?
What did they want?

4. CUSTOMER CONCERNS

It was apparent, especially to our front line staff, that we had some fundamental problems, mainly associated with the tremendous growth in patronage that had occurred over the previous years.

A. Passengers had great difficulty getting on the trains in the peak hours.

B. Passengers couldn't easily leave the platform because there were insufficient escalators or ticket barriers.

C. You couldn't conveniently access some stations as there were insufficient entrances.

And when we talked to our customers, they added a few more items.

D. They did not want a personal service, unless they were disabled, but they did want a reliable service.

E. ***A good journey was one you didn't notice.***

F. In general, passengers wanted a mass transit - low fare railway. They did not expect a seat unless they travelled first class or were elderly or pregnant etc.

G. Passengers wanted a hassle-free, journey:

- Not too long to wait = **Frequency**
- No delays, regular service = **Reliability**
- Convenient and easy ticketing - i.e. the Common Stored Value Ticket (CSVT)

H. Passengers understood that occasionally something may fail, but it should not be too often, once or twice a year was acceptable, and then we should, recover beautifully - give help, show we care with a 'can-do' attitude, and give plenty of information on what is going on, what people should do etc.

5. STAFF CONCERNS

In the process of talking to our staff about customers, it became apparent that our staff were not totally happy with our organisation either, which was a surprise to us.

In a service organisation such as ours, it is the staff at the bottom of the organisation who have the most, direct impact on our customers, and in turn this can impact directly on the company's financial performance.

In 1990, we carried out our first detailed employee attitude survey of all employees. Whilst we were not surprised at the responses, we were surprised at the extent and depth of feelings expressed. In summary, our employees were frustrated and confused about our objectives, what were we trying to achieve. They felt there was a lack of support and many staff in the front line said they were not confident in interfacing with our customers.

Another common response reflected that :

I tend to treat people the way I am being treated.

and this went all the way down the line. Unfortunately there was clear evidence of us treating our employees as costs, overheads, units of production - rather than one of our most valuable assets, crucial to the long term success of our business.

If you want happy customers - you need well motivated employees. This applies to both the managers and the front line staff.

6. VISION, MISSION, CORE VALUES

With the benefit of structured research with our customers, our staff, and other stakeholders, we developed our vision, mission and core values. This process involved every member of the corporation, with many briefings, workshops, seminars, video discussions, etc. Then at the end of 1991, we were able to agree the final wording and our Vision, Mission and Core Values were launched within the company.

Vision : *To be recognised as a world leader in providing quality transport services on a commercial basis.*

Mission : *Our mission is to provide quality transport and related services in Hong Kong and with China in a safe, reliable, caring, cost-effective and environmentally responsible manner.*

We are dedicated to finding better ways to:

- *Serve our customers.*
- *Fulfill Corporate and Government objectives.*
- *Maintain our financial strength.*
- *Develop sound business partnerships.*
- *Build pride, teamwork and commitment in people.*
- *Encourage initiative and reward success.*

Core Values :

- *Keep Customers First*
- *Continue Improving*
- *Respect and Trust*
- *Communicate Effectively*

Whilst this is not a lot of words for 12 months' work, the process was extremely rewarding and stimulating. We also came to understand that these statements applied just as much to our internal customers as to our external fare paying customers, and not only customers on our trains and buses, but also for freight and property.

7. CUSTOMER INITIATIVES

Looking back, the launch of our core values, and the involvement of everyone in developing these was very significant in changing our culture. It was the key that unlocked the door. It created the will to change, and the desire to

get better, to improve. It enabled us to take bigger steps in the 'right' direction and smaller steps that side-tracked us, or took us away from our goals. There was a new focus and a common orientation across the whole company, that I hope you can see in our services today.

Fortunately we had already placed a contract for 9 x 6 car units in 1988, and we had increased the order to 16 x 6 car units in September 1989. These were delivered and entered service between 1990 and September 1991. So we had addressed the first fundamental problem of a lack of train capacity.

I would now like to share some examples of the sorts of initiatives we have undertaken?

7.1 We introduced a 'Landlord' concept of station management, strengthening the role of the local station manager with his/her staff as a family, totally responsible for their stations and passengers.

7.2 Bureaucracy - a strong commitment from the top NOT to increase it and to seize every opportunity to reduce it.

7.3 Policies and Authorities - a complete reversal from 'you can't do anything except .....', to 'you can do everything except .....' a few things that are reserved, e.g. investment over $20m requires Board approval etc.

7.4 We introduced Passenger Liaison Groups - 40 passengers who use our service everyday, meet in 4 groups with an independent group leader, currently from the Chinese University, to discover in a structured way, passenger comments and reaction to our services, and to explore their expectations for the future.

7.5 Passenger Forums - about 10 senior managers from operations, the local stations, marketing, engineering, finance and personnel, meet the customers, one evening once a month, at each station in turn. Meeting at each station once a year.

7.6 Punctual was redefined as time to $2\frac{1}{2}$ minutes and no delays over 20 minutes because when you consistently achieve this, the passengers believe they have good service, outside this they consider the service is poor.

7.7 The customers said they liked the platform queuing boxes then on trial on the MTR, so we implemented them throughout the railway. We also learnt another lesson here in that this improvement was very visible to all our passengers, they could see in a very tangible way that we were doing something to improve.

7.8 The customers wanted us to help the disabled and disadvantaged passengers. We already thought we did, but it was not apparent, so we developed and introduced a disabled assistance scheme, and made it very visible with signs, posters, call bells etc.

7.9 We put up very large signs at entrances and exits saying 'Welcome to KCR', 'Thank you for travelling by KCRC', and again this sent a very powerful and visible message not only to our passengers but also to our staff, that we really did mean what we had said.

7.10 We developed a new design and modern graphics for our station signage. Shatin was the pilot station in 1993 and this is now the standard for all stations will be finished at the end of 1995.

7.11 We opened two Customer Services Centres at Shatin, and Kowloon. These centres were designed to help customers, and provide information, either face to face or by telephone or fax. We have a hot line service, the centres receive suggestions and complaints and provide many answers on the spot. They also sell souvenirs

and special tickets, etc. These centres have been very well received and we have opened two more at Tai Po Market and Sheung Shui.

7.12 We have introduced new, high quality, digitally recorded announcements on the trains that make it very easy for our staff to communicate to a high standard in three languages: Cantonese, English and Mandarin.

7.13 We have installed 61 additional ticket barriers, and opened new station entrances at Kowloon, and Kowloon Tong, Tai Wai and Sheung Shui.

7.14 We have renovated and refurbished Lo Wu Station and we are currently doubling the width of our connection to the MTR at Kowloon Tong. Work on a new entrance to Fanling Station should start later this year.

7.15 We have installed new high capacity heavy duty escalators at almost all stations. Work is now in progress at Fotan and Sheung Shui and Kowloon Tong. Eventually we will replace all the escalators on the railway.

7.16 Our Board has authorised major improvements to Kowloon Station and renewal of the signalling and control systems.

There are many more improvements in hand, and I hope these examples give you a sense of the depth of our commitment to improve our service. However it should not be assured that we are spending money regardless of our 'bottom-line'. The expenditure is carefully prioritised to achieve the most significant benefit to our customers, within our budget.

8. EMPLOYEE INITIATIVES

These have been essential and go in parallel with the customer initiatives.

8.1 We involved our staff with Quality Control Circles, and Work Improvement Teams which on the stations and train crew have developed into Customer First Teams.

Together with training these improvement teams have been extremely effective in achieving many improvements. One of great significance is train punctuality. The drivers and panel operators knew why trains were delayed and helped us to get the timetable right. We have a difficult task combining a high density EMU stopping service, with higher speed non-stopping international trains and freight trains all running on the same line. Once the punctuality improved the Engineers could focus on equipment reliability and the impact it had on the service. Gradually we have forced our daily punctuality up from 85% to 98%, 99%, and 100% as routine. We have also saved over 10% on our traction energy bill, and reduced the journey times.

8.2 We introduced Customer Service Awards in most departments. With 800 operating staff we usually give 15-20 awards each month, each person is presented with a nice certificate and a gift voucher at a special ceremony, with all our managers present to demonstrate their support. It is good to see the managers pride as they explain why a member of their team is to receive an award.

8.3 In 1992 working with Andy Clark of Lifeskills in the U.K., we developed a 'best practice' manual describing what excellent service looks like to our customers. This started with our customers and our employees helped develop the contents, to make it relevant and useful to the staff in the front line. In this manual we explain and show the difference between good service and outstanding service as defined by our

customers. This applies not only to station staff, but also to engineering technicians, office staff, anyone who interfaces with a customer.

All staff, including every manager, then participated in a two-day workshop, on what the best practice is for them, concentrating on the practical things that they personally can do to make a difference.

This manual has since been reviewed and refined as we have moved towards accreditation to ISO 9001.

9. CUSTOMER SATISFACTION

This was a new area for us and being on the leading edge of customer research took a considerable time and much hard work to develop. Customer satisfaction is critical to our financial success, therefore it is important that we measure and track our customer's level of satisfaction with our performance.

Working with railway colleagues in Barcelona and London Transport and with Marketing Decision Research in Hong Kong, we have developed a technique to measure this on a monthly basis.

We have a pool of 2,000 regular customers, approximately 200 per station, who have defined the top 20 key attributes of our service and the relative level of importance of each attribute. Then on a monthly basis, we ask these passengers to record their level of satisfaction against each attribute. In this way, we can determine, their overall level of satisfaction and identify and prioritize which areas we should address next.

The information is available for the whole railway and by station, providing each station management team with feedback both to note progress which is always encouraging, and to decide what to do next. The Customer Satisfaction Index was first introduced in October 1992 and a summary of the results to date are given in the Appendix.

10. CONFORMANCE WITH BEST PRACTICE

Once we have determined the best practice from the customer's point of view, it is possible to systematically observe and record if we are conforming to the guidelines. We have developed a special survey technique, using trained independent surveyors who then use the railway, ride the trains, make enquiries, purchase tickets, etc. and record our performance against the defined standard. We now make this survey three times a year, and again this provides useful data and a benchmark for us to improve on. Helping us improves our both service and our definition of 'best practice'.

11. OUR SERVICE PLEDGE - A COMMITMENT TO OUR CUSTOMERS

In 1993, we published our service pledge, which reflects our commitment to our customers with performance targets for train frequency, punctuality, reliability, safety, availability of escalators, ticketing equipment, and other facilities. Also included was a commitment to keeping passengers informed and to further improving the quality of our services.

Passengers are advised how well we are doing through our monthly newsletter, KCR highlights and on a special display at Kowloon Station or over the LED information boards at Shatin.

12. A QUEST FOR EXCELLENCE

We are already seeing the favourable results of our efforts, with continuing growth in passengers, increasing at a rate above the population growth. A summary of the key performance indicators are shown in the Appendix. Complaints are down by 27% from 4.9 per million passengers to 3.5 per million

passengers. In general there is a much higher perception of KCRC and our services. We have been able to have a fare rise below inflation for 8 consecutive years. In 1994 we could declare that our cash flow and profit levels were sufficient that despite 10% inflation, and a significant capital investment programme of over $1 billion per year, we did not need to raise fares.

Profits with and without property development continue to increase, and we are achieving an increasing return on net assets employed of about 12-17%. We have provided dividends to our shareholder, the government.

The next key step that we are all involved in, is to expand this customer focused, business driven approach to all parts of the organisation, so that we become a Total Quality company, clearly recognised as World Class by our customers and competitors.

In 1994

We established five quality goals for:-

- Safety
- Customer Satisfaction
- Employee Satisfaction
- Efficiency
- Profit

and these were built in to our business plan for 1995-1998. Efficiency whilst easy to comprehend is proving difficult to set measurable targets, reducing the cycle time to make a major change to the timetable is straight forward. Doing the same for the fare rise consultation process where District Boards and user groups want more consultation is more difficult. However the concept of efficiency - doing more with less, achieving the results right the first time more quickly and less painfully is at the heart of our management approach.

13. ACCREDITATION TO ISO 9000

The procedures required by ISO 9000 are fundamental to ensuring we can deliver a quality product in a consistent and efficient way. The ISO 9000 standards are more closely aligned to manufacturing and engineering and I am pleased to say that our Rolling Stock Maintenance Department was accredited to ISO 9001 in 1993. The first railway in Asia to achieve this and our Infrastructure and Buildings Department that maintain the station track, signalling and overhead line was accredited in 1994 together with the Light Rail Rolling Stock Department.

Since the introduction of ISO 9000 we have seen our rolling stock reliability steadily increases from 129,000 to 200,000 km/failure. The cost of maintenance has reduced by 10% in real terms and availability has increased so that we now operate two extra trains in the morning peak. This has brought direct customer benefits of extra capacity, extra reliability and lower fares.

Although more difficult we are now pursuing accreditation to ISO 9000 in our operational areas and across the whole Corporation to help bringing the significant benefits of consistency, effectiveness and reliability.

The station operations should be accredited in 1994, with train crew, training, administration, in early 1995 together with our Freight and Bus Divisions.

I would stress that having the systems and procedures in place to achieve accreditation to ISO 9000 is the process by which we can consistently and cost effectively deliver our service.

This is one of the necessary requirements along with having a very clear customer focus of being a quality company with a big Q.

14. A TOTAL QUALITY APPROACH - OUR QUEST FOR EXCELLENCE

A Total Quality approach within Operations requires that we :-

- ***Understand what the customer wants.***

- ***Find a cost effective and profitable way to provide this service, right first time, for every customer every day.***

- ***Make it very easy for our employees to do a good job.***

However this is not enough for the whole Corporation. We need more.

The definition of what is required to be considered as a Total Quality company is clearly described in the USA - Baldridge criteria which is also reflected in the Hong Kong Management Association - Quality Award.

We are now using this to audit ourselves and to identify the gaps which are the opportunities for further improvement. Closing these gaps will be part of our continuing quest for excellence.

15. LOOKING TO THE FUTURE

We are now planning to further upgrade and enhance our international service to Guangzhou working with our partners, the Guangzhou Railway Corporation, who have just raised the speed of their line to 160 kph. The highest in China. We have been asked by the Government to make proposals to build and operate a new railway from Kowloon West and Kwai Chung to China, with a link to Yuen Long and Tuen Mun, which will be of major benefit to the people in Hong Kong and China.

I am confident that as we continue our Quest for Excellence, the KCRC will soon be recognised as a world leader in providing quality transport services on a commercial basis.

APPENDIX

CHANGE OF SERVICE CULTURE ON THE KCR - A QUEST FOR EXCELLENCE

APPENDICES

1. Average Daily EMU Passengers 1990 - 1995.
   Operating Profit / Return on Assets 1990 - 1994.

2. 'Real' Fare Levels 1990 - 1995 at 1990 Prices.
   'Real' Cash Operating Cost per Passenger 1990 - 1995 at 1990 Prices.

3. EMU Reliability 1990 - 1995
   Customer Satisfaction 1992 - 1995

4. Customer Satisfaction June 94 - June 95

5. Customer Satisfaction - Details June 94 - June 95

6. Customer Satisfaction by Station June 94 - June 94

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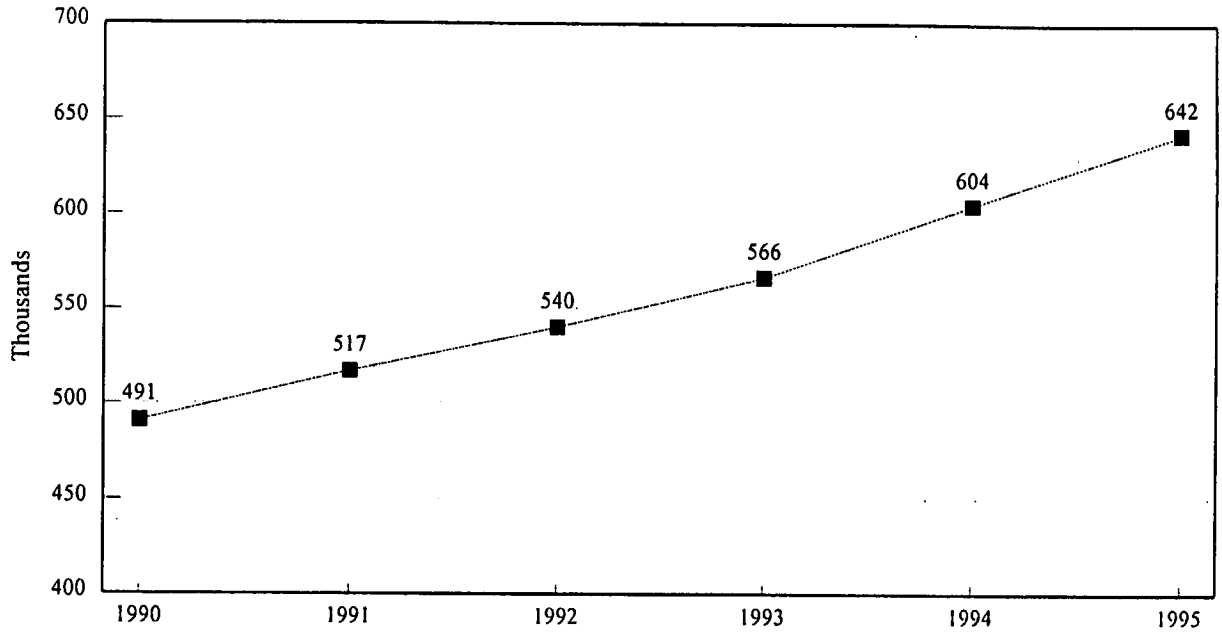
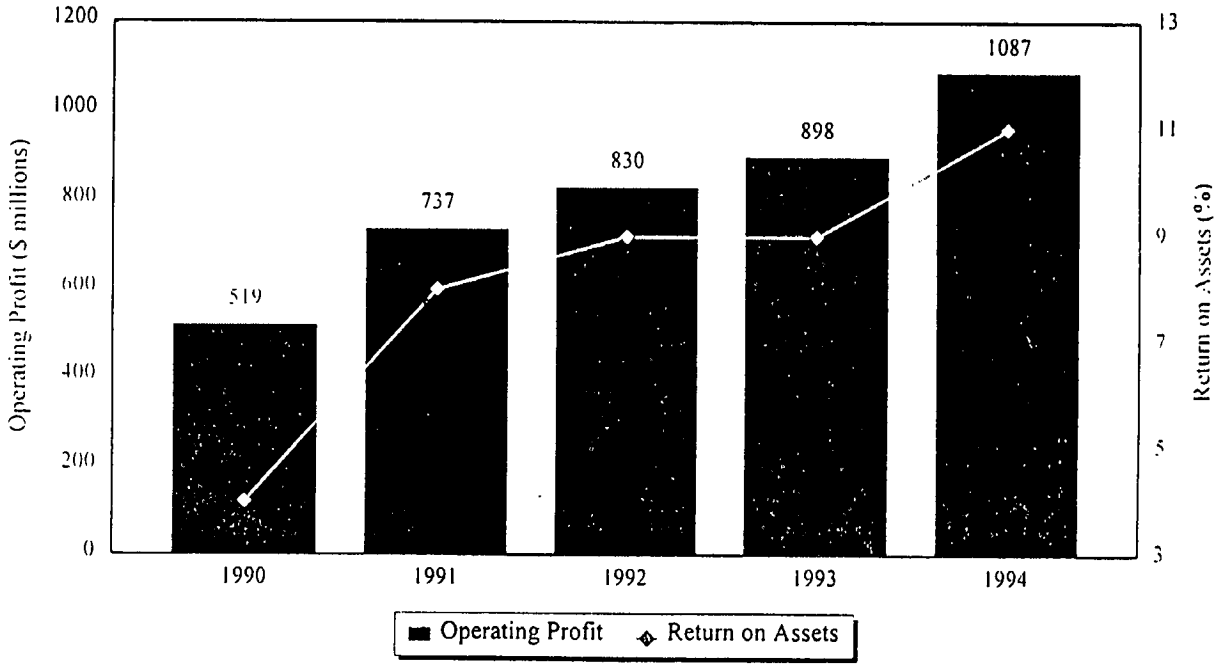
Appendix 1 of 6

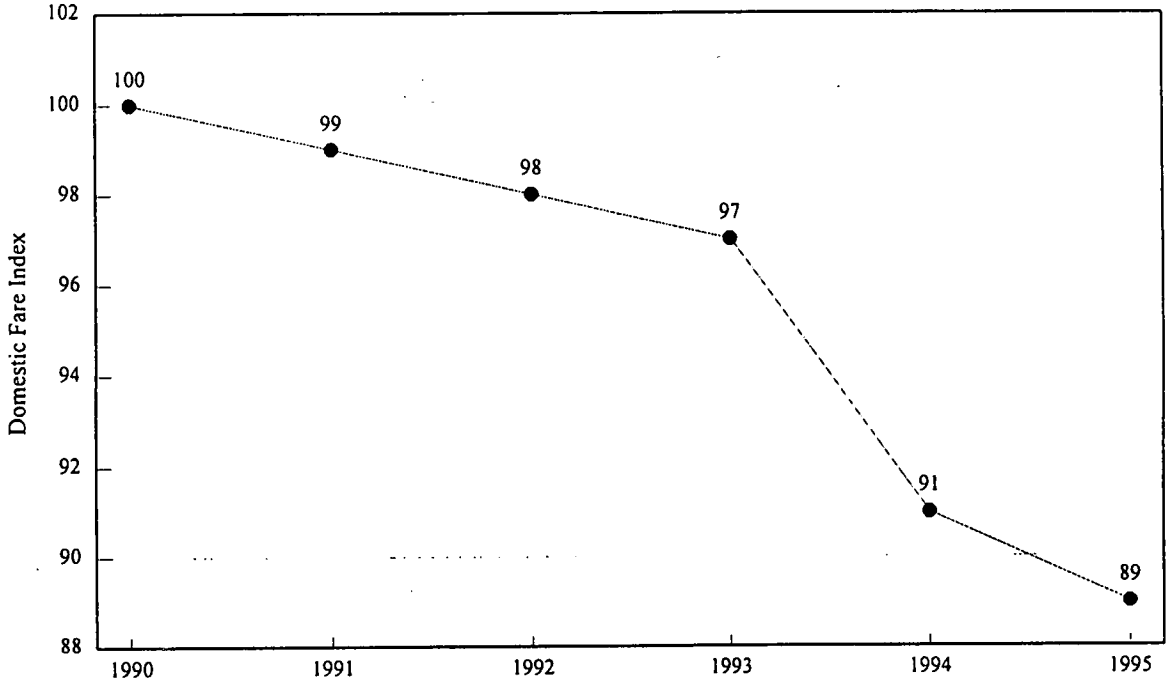
Average Daily EMU Passengers



Operating Profit/Return on Assets

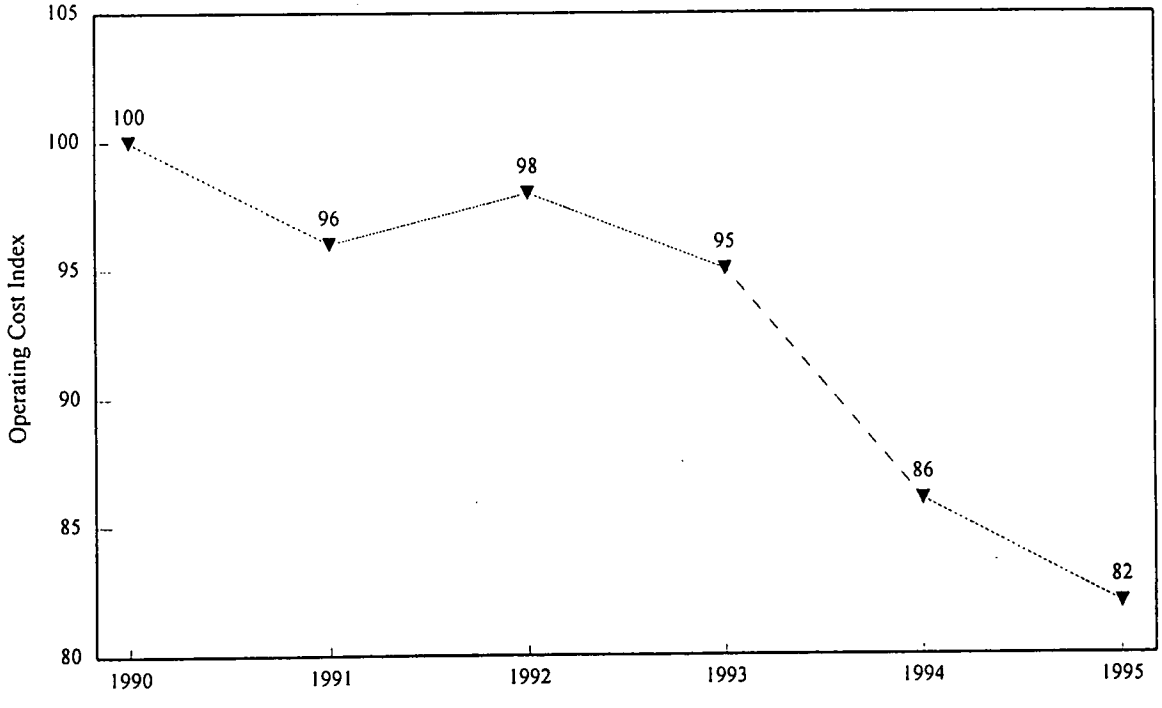


Real Fare Level



The real cost of riding on KCR is now 10% cheaper than it was in 1990

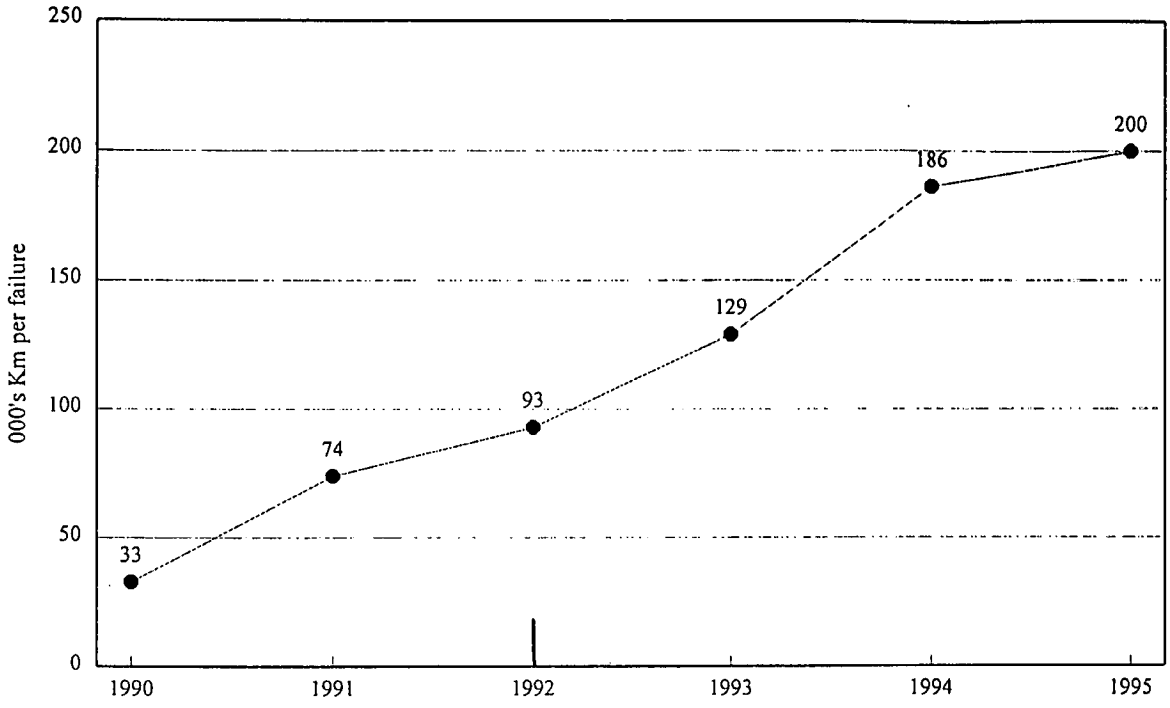
Real Cash Operating Cost Per Passenger



Real operating cost before depreciation is decreasing

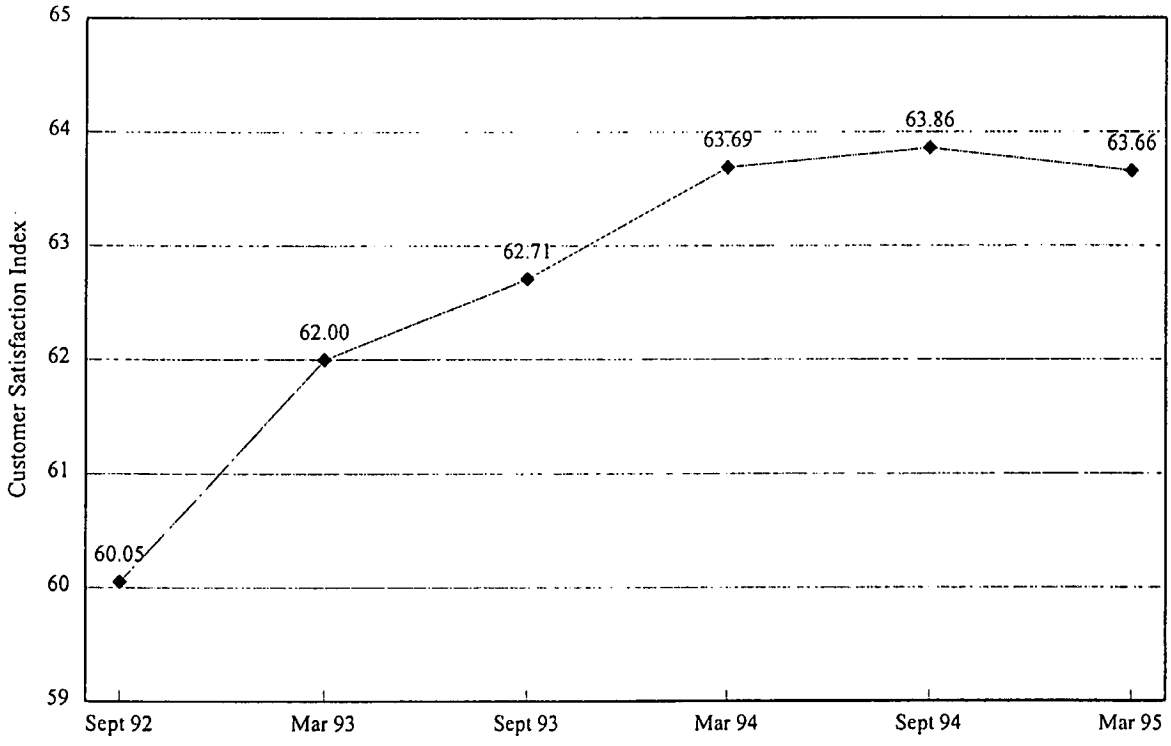
Appendix 3 of 6

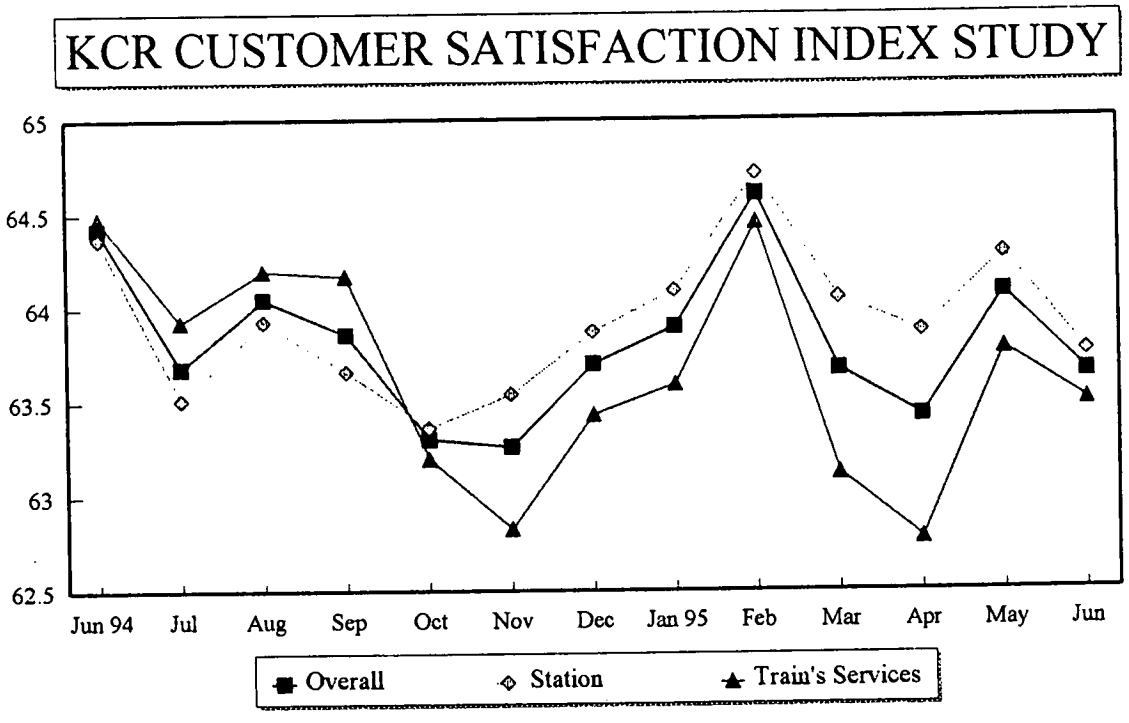
EMU Reliability

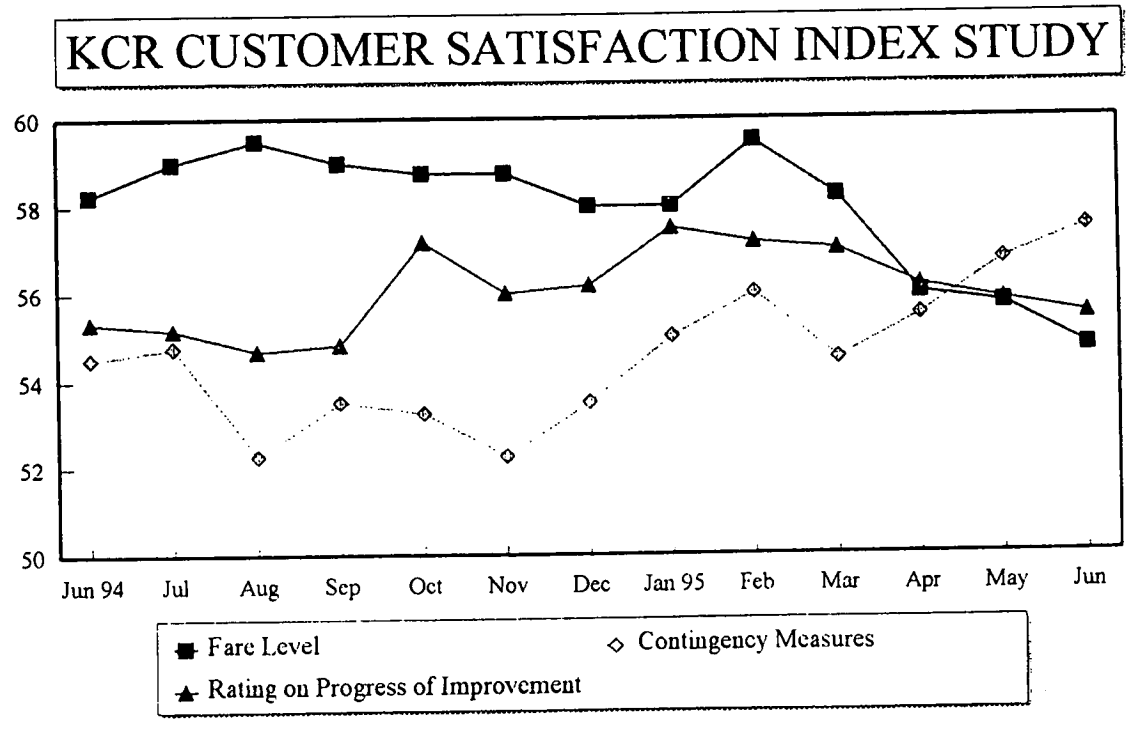


Begin ISO 9001 in 1992, ACCREDITATION in 1993

Customer Satisfaction




KCR CUSTOMER SATISFACTION INDEX STUDY
65
64.5
64
63.5
63
62.5
Jun 94
Jul
Aug
Sep
Oct
Nov
Dec
Jan 95
Feb
Mar
Apr
May
Jun
Overall
Station
Train's Services


KCR CUSTOMER SATISFACTION INDEX STUDY
60
58
56
54
52
50
Jun 94
Jul
Aug
Sep
Oct
Nov
Dec
Jan 95
Feb
Mar
Apr
May
Jun
Fare Level
Contingency Measures
Rating on Progress of Improvement

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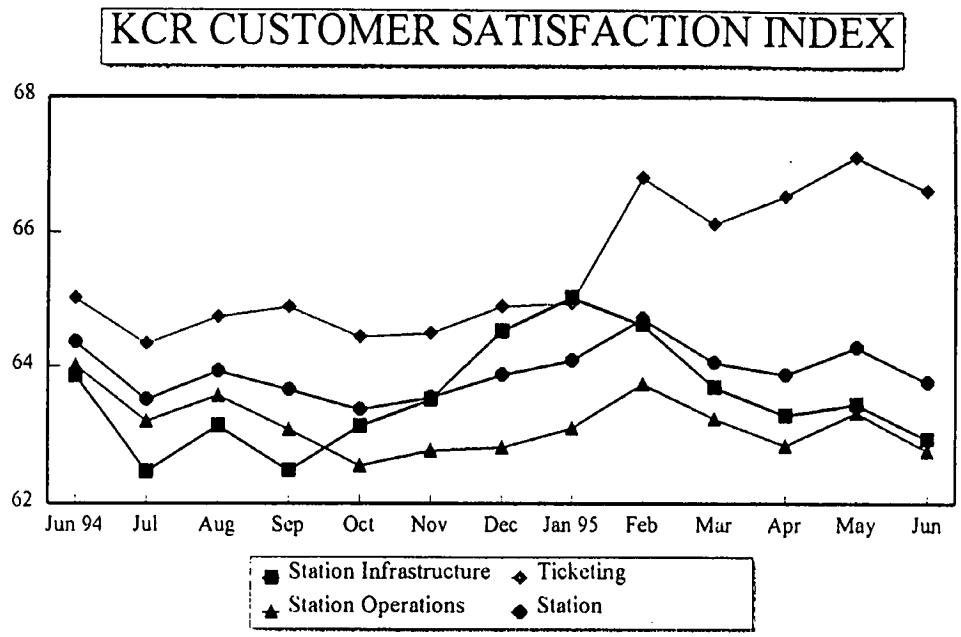

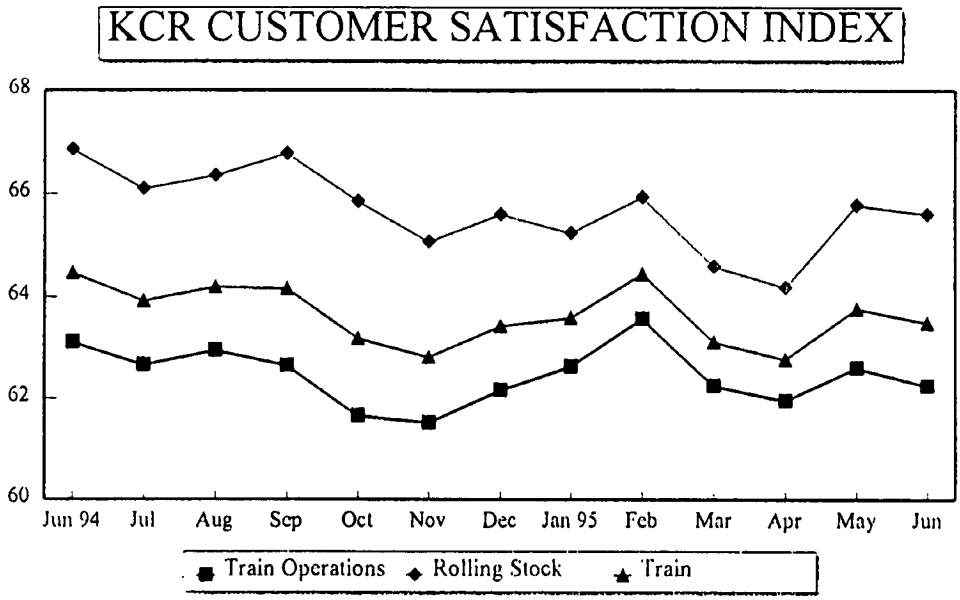

Note : Attributes change since Feb 95 :

Out from CSI :

Convenience of buying ticket from TVM

Signage at station are clear and easy to understand

Convenience and efficiency of handling malfunction ticket

Add in CSI :

Escalators at the station always work properly

Enough space on the station platform for the waiting passengers

SATISFACTION SCORE/INDEX OF KCR'S STATION AND TRAIN

STATION	JUN 94	JAN 95	FEB 95	MAR 95	APR 95	MAY 95	JUN 95
KOWLOON	64.09	64.68	66.21	[65.08]	[64.73]	[66.03]	[64.75]
MONGKOK	66.19	65.31	[66.90]	[64.87]	[65.73]	64.50	64.21
KOWLOON TONG	62.36	62.10	63.31	63.54 #	63.73	63.59 #	62.44 #
TAI WAI	65.60	63.21	63.04 #	63.11 #	63.63	63.51 #	64.03
SHATIN	63.66	64.21	64.17	64.29	63.81	64.55	64.29
FO TAN	63.16	65.20	61.73 #	63.64	62.61 #	[65.17]	63.86 #
UNIVERSITY	66.23	64.49	63.63	64.23	63.54 #	63.68	63.94
TAI PO MARKET	66.40	64.98	[66.81]	64.26	[65.41]	[65.22]	[64.50]
TAI WO	68.88	66.74	[66.71]	[65.70]	64.63	64.15	[64.54]
FANLING	65.61	65.78	66.39	63.68	63.77	64.79	[64.50]
SHEUNG SHUI	62.36	62.45	62.80 #	62.70 #	60.84 #	61.87 #	61.42 #
STATION SATISFACTION INDEX	64.37	64.09	64.71	64.03	63.87	64.28	63.76
TRAIN SATISFACTION INDEX	64.48	63.59	64.45	63.12	62.78	63.78	63.50
OVERALL KCR'S STATION AND TRAIN SATISFACTION INDEX	64.42	63.90	64.60	63.66	63.42	64.08	63.65

Key : Top three stations with highest scores are boxed.
Bottom three stations with lowest scores.

Paper No. 8

HEC's VISION AND STRATEGY OF CUSTOMER SERVICE

Speaker : W.M. Choi
Senior Customer Supplies Engineer,
The Hongkong Electric Co., Ltd.

HEC's VISION AND STRATEGY OF CUSTOMER SERVICE

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ABSTRACT

Being a utility entrusted to supply electricity to Hong Kong and Lamma Island, HEC has a mission to provide quality services to the customers. To pursue this mission in the backdrop of rising customers' expectation over the years, the management has actively promulgated the service vision to all levels within the corporation and successfully created a conducive service culture with a view to meet, and hopefully to exceed, the standard of service expected by the customers.

HEC formulated and documented its Customer Services Policy which contains critical areas of focus in service delivery. Through adherence to and constant practice of the Policy, a set of shared values towards quality service objectives are conveyed and accepted by all staff who well appreciate their responsibility and accountability to the customers. With the overall objective to provide reliable, efficient and courteous services at a fair price, HEC's vision is to maintain customer-focused and service-oriented in all activities.

This paper describes the vision of HEC in customer service and illustrates the strategies on forming a conducive service culture, the use of pioneering but well-proven technology, developing customer-friendly services and enhancements, together with re-engineering processes for service excellence.

1. INTRODUCTION

HEC supplies electricity to Hong Kong and Lamma Island with about half a million customers. As one of the oldest utilities in the world that started to operate in 1890, HEC has a long tradition and great determination to provide first-class service to customers.

With the rapid economic growth in Hong Kong over the past two decades, the city has become more affluent with continual improvement in standards of living. Customers' demand and expectation have grown at the same pace, if not faster. At the same time, the rapid development of commerce and communication facilities turned our city into one of the most important international service centres in the world with lots of opportunities for anyone to share information worldwide about the level of service provided. Coupled with the government's emphasis of consumer protection, public utilities today are facing more challenges ever encountered.

Realizing its entrustment by the public and their ever increasing demand and expectation, HEC has a mission to provide reliable, efficient and courteous services at a fair price. It also undertakes to make the best use of the resources and technology in the continuous strive for excellence in customer service. To pursue this mission, visionary strategies were adopted for continued service improvement.

2. TECHNOLOGICAL EXCELLENCE

Technological excellence has long been a strategy within HEC to achieve safety, efficiency, productivity and environmental protection in the supply of electricity. The technical system was built up of pioneering plants and equipment that reflect state-of-the-art technology.

There are many examples in successful applications of advance technology that make the company distinctive in the particular arenas. For instance, to achieve remote-controllability and monitoring on the distribution network, implementation of

SCADA systems for distribution automation was started since the late 70s and fully commissioned in the late 80s. Moreover, to enhance the planning, operation and maintenance of the network and underground installations, HEC pioneered in the use of Automated Mapping/Facilities Management (AM/FM) system since the early 80s. The system by now provides a full coverage of all our underground installations and facilitates coordinated planning on network and daily operation. Moreover, to support a high speed and capacity wide area network for computing, an advanced FDDI in the form of a dual-ring configuration for enhanced reliability was installed in 1993. Moreover, a trunk radio system that supports voice, data and mobile facsimile was developed to enhance operation of the transmission and distribution system.

In the area of environmental protection, the Flue Gas Desulphurization (FGD) Plant commissioned in September 1993 for reducing 90% of emission of sulphur dioxide from the generating unit was the first of its kind in the territory. Also in order to avoid disturbance to the landscape/scenery in our country park and disturbance to the traffic caused by pylons and open-type trench works respectively, HEC built two tunnels, one of 3.1km and the other 5.7km, between the northern belt and the southern parts of the Island for running transmission and communication cables. These innovative engineering projects marked the commitments of HEC to maintain a greener environment in Hong Kong.

Under the strategy of technological excellence, there has been very significant gain in efficiency and reliability. In real term after discounting increases in CPI(A), price of electricity has reduced by over 40% in the past 12 years.

Despite these remarkable results generated by technological excellence, the management saw a need and opportunity for even better customers' satisfaction by incorporating an overall service excellence strategy. Focus was particularly given to front-line operations and management on the demand side as these areas are most 'visible' and readily appreciated by customers.

3. CUSTOMER SERVICES POLICY

By analysing and surveying the needs of customers, HEC formulated and documented its Customer Services Policy (Exhibit 1) which lays down a framework defining the most important values in service delivery. All these values are centred around customers and services and aim to foster a 'customer first' service culture within the organization.

The values contained in the Policy include customer orientation and focus to which all functions should support this ultimate goal, unity and harmony in team-building, desirable service attitude, honesty and reliability to gain customers' trust, openness in service standard/ targets and channels for opinions, care for the needs of the minority in the community, strive for excellence and prompt response to customers' requests.

Awareness of these values by all levels were done through Management's active promulgation in internal publicity, seminars and campaigns. Through constant practice, a set of shared values and service culture were created.

Gradually, all staff realised that customer service is no longer limited to those working in the front-line but also to those working at the back office who shall treat other function units as 'internal customers'. The implication has become very clear that everyone within the company has a role to play in customer service. This has also given a clear sense of contribution and mission to all staff and in fact this service culture has been the most important element instrumental for pursuing the customer excellence strategy.

4. CUSTOMER SERVICES STRATEGY

The excellence services strategy is an

integration of engineering, people management and processes as depicted in Exhibit 2. Under top management's initiative and policy for excellent customer service, the strategy was implemented through strengthening and re-structuring of various systems which can be grouped under three headings as **Technology**, **People and Organization, and Service Delivery Processes**. All systems are designed and operated with the ultimate goal in achieving customer satisfaction. There were many enhancement programmes for implementing the strategy and the salient ones and results are described below.

5. GLOBAL SEARCH FOR EXCELLENCE

HEC has been actively searching for models of excellent service around the world for exchange of strategies and practices. While the local context may sometimes differ to a great extent from the overseas counterparts which makes it difficult or impossible to replicate these strategies, it has always been stimulating to look around and study what others have been doing in customer service and learn their success stories. By doing so, the company can always keep itself at the forefront of the world trend and development. Over the years, a lot of ideas and practices were adapted to the local context and successfully implemented with fruitful results. The process also maintains the company a valuable information base and a library of best practices for future development. In this aspect, HEC advocates active share of information and experience on services for promoting the benefit of customers, local and overseas alike.

6. SERVICE STANDARDS AND TARGETS

While publicising corporate service standards and targets have become very popular and common nowadays, HEC has been actively developing this since 1992 for better customer service. With the more and more emphasis on openness to customers, such publicised targets make customers more knowledgeable of what they can expect in those important areas of service such as system reliability, waiting time for front-line services and connection of supply, etc. Over the years, these targets were broadened in scope and higher standards were set for the services. With the hard work of the staff, all these targets were exceeded and reported to the customers to illustrate the company's commitment to serve them better (Service Targets for 1995 as shown in Exhibit 3).

Within the company, there are internal service targets for most major Sections whereby the quality and level of service to customers and/or other function units are laid. This regime not only provides the Management a simple and clear monitoring system on performance but also maintains suitable pressure for every function unit to improve.

7. PROMOTION ON CONVENIENCE AND PERSONALISED SERVICES

Until the turn of the decade, public utilities were viewed as 'authorities' by the general public as well as some staff in the company. With the gradual change in service culture, the staff recognize their responsibilities and accountability to the customers. In delivering their services, they would put themselves in the shoes of the customers. Along this line, a series of services providing more convenience to the customers were promoted.

With the establishment of a re-structured call centre, the mode of service was shifted from over-counter to telephone for added convenience. In fact, HEC took the lead to re-engineer the work-flow after enhancing the necessary IT support in 1993 to allow customers to process their applications of electricity accounts through telephone. This laid an important milestone in front-line service to effectively improve customer satisfaction by re-engineering the service

delivery process instead of improving the efficiency in the old way of business. More and more activities under the remote processing strategy are now on the drawing board.

On the other hand, the company also emphasises more personalised services. For instance, past encounters with customers are now logged in the Customer Accounts database for reference of all staff in the future. When circumstances allow, the staff prefer talking to the customers directly over phone rather than communication by letters so that any personal need and feedback could be immediately spotted. Obviously, this entails a series of front-line empowerment and training which HEC has been actively pursuing to gear up with the customer service enhancement programme. Moreover, in order to reinforce excellent service behaviour, the Certificate of Excellence Scheme was designed to reward those front-line colleagues with continuous excellent performance by top management recognitions as well.as monetary rewards.

In the past, customers very often found it necessary to interact with several different functional units within the company for a particular service. With the active promotion of one-stop shopping and one-stop service, most activities are now grouped in a way that one representative from the company will take up the whole process. For instance, customer accounts and technical advice were two functions situated at different offices and they were combined to form an integrated Customer Centre where customers and contractors alike can enjoy one-stop shopping. Vertical integration and job enlargement were also implemented so that the scope of front-line work can encompass customers' need and be completed by one representative as far as possible.

8. CARE FOR THE MINORITY

As a body providing public service, the company also realises its obligation for caring the needs of the minority group in the community and advocates equal opportunity of participation in receiving the services. To this end, a lot of enhancements were developed in the past few years which include:

- Improved accessibility to the Customer Centre for the disabled and setting up express counters for them
- Commissioned braille service for billing and service pamphlets for the visually impaired and facsimile hotline for the hearing impaired
- Multi-language services
- Concessionary Tariff Schemes for the Elderly and Disabled with financial difficulty and waiving of their deposits
- Registration and special care to customers depending on life-supporting facilities

9. FREE TECHNICAL ADVICE SERVICES

Though by Ordinance it is the customers' responsibility to take care of their own installations, however, there are some niche areas whereby the company could afford technical services to further improve satisfaction.

Ambassador programmes are organized which include technical visits to customers on electricity related matters. Seminars are held regularly for members of Electrical Contractors' Association, Electrical Workers' Union, District Office/Kai Fong Associations to advise on technical requirements for electrical installations. In 1994, the programmes was extended to include security of supplies at hospitals and public entertainment locations.

There are many other services regarding technical advice to customers, namely, energy survey for domestic households with detailed report on estimated consumption of appliances, advice on voltage problems, load factor and power factor, electromagnetic interference, voltage dip prevention and the use and choice of UPS, etc. which are all very common problems faced by the customers. All in all, the

company tries hard to expand the service base from traditional routines to customer-friendly and value-added selections.

10. EMPHASIS ON SPEEDY RESPONSE

As one of our shared service values, speedy response to requests for front-line services were strengthened and put forward as publicised service targets.

Average waiting times for counter and telephone services by customer services representatives were dramatically improved to three minutes and nine seconds respectively after a major re-structuring and front-line empowerment. In the area of response to emergency service calls in urban areas, the 3-shift emergency team managed to achieve a record of average 23 minutes in 1995. For requests to connection of supplies that do not involve inspection work, the company has pledged and met the target of completion within the next working day. While the company is not complacent with these results, customers appear to be quite satisfied with the performance.

11. CUSTOMERS' FEEDBACK

Customers' feedback are important elements for gaining service excellence. After all, it is customer satisfaction that the programs are striving for. Customers' complaints were the traditional means to understand customers' points of pain and the strategic break points. However, with the improved service and various enhancements, the no. of complaints had been drastically decreasing and this could no longer be too much relied upon for improvement. Instead, the company took a more proactive approach to survey customers' needs through other channels.

Since 1992, the company has been convening regular Customer Liaison Group meetings with voluntary participation of customers. Over the years, a lot of improvements were made through the discussions, particularly those issues that could easily be overlooked from the supply side. Customers are also free to give their opinion and commendations by dropping a note to our suggestion boxes at all service centres. The company also hold regular after-service survey for major front-line services including counter and telephone services, emergency services, inspection and advice services. These survey results have proven to be useful in resource allocation and quality improvement. On top of all these mechanisms, the company encourages front-line employees to reflect what they perceive in their daily encounter with customers. In fact, over the years there were many enhancements generated from front-line contacts. As part of the programme implementation process, it is always a practice to consult the views and opinions of front-line staff who, based on their experience, would point out operational constraints and attributes affecting the success of these programmes.

12. CONCLUSION

The increasing expectation and demand from customers in quality services have posed a new challenge to public utilities. HEC realised it is no longer enough for a company to achieve customer satisfaction by merely improving on the supply side. Traditional ways of enhancing efficiency of production in terms of technology and workforce improvements could only relieve part of the pressure from customers' demand.

Today, visionary strategies are required to achieve service excellence by integrating innovative technology, people and organization, and management of service delivery processes to gain customer satisfaction. Such strategies require innovative design and operations management on both the technical systems as well as human resources. Moreover, the challenge for service excellence is not limited to top management and front-line

personnel but to all levels within the company and entails concerted efforts to achieve. A corporate 'customer first' service culture is essential for reaching the goal of total customer satisfaction.

HEC has been implementing such strategy for many years in order to maintain reliable, efficient and courteous services at a fair price. It will continue to strive for service excellence by implementing visionary strategies now and in the future.

Acknowledgement

The author would like to express his sincere thanks to the Management of The Hongkong Electric Co., Ltd. for the support and permission to present this paper.

CUSTOMER SERVICES POLICY

Customers	To adopt a customer-focused and service-oriented approach in all our services.
Unity	To work in unity and harmony as a team to serve our customers.
Sincerity	To be sincere, courteous, and patient to our customers.
Trust	To gain the trust of our customers by being honest and reliable.
Open	To be open by setting out in plain terms the standards of services and to provide channels for our customers to air their opinions on our services.
Minority	To care for the needs of the minority in the society.
Excellence	To strive for excellence to exceed the standards of services expected by our customers.
Response	To respond promptly to our customers' requests.

Exhibit 1

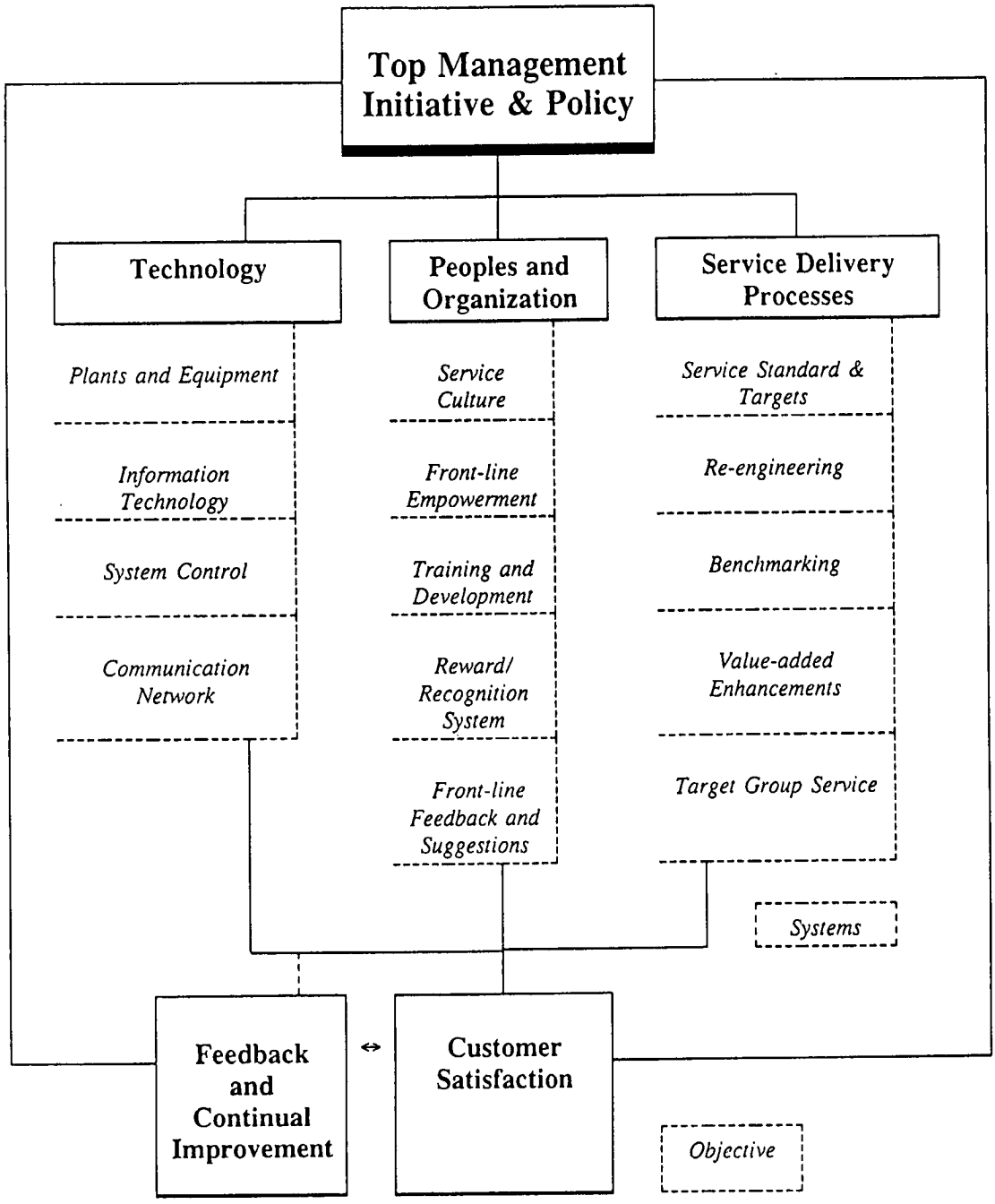
Top Management Initiative & Policy
Technology
Peoples and Organization
Service Delivery Processes
Plants and Equipment
Information Technology
System Control
Communication Network
Service Culture
Front-line Empowerment
Training and Development
Reward/ Recognition System
Front-line Feedback and Suggestions
Service Standard & Targets
Re-engineering
Benchmarking
Value-added Enhancements
Target Group Service
Systems
Feedback and Continual Improvement
↔
Customer Satisfaction
Objective

Exhibit 2

THE HONGKONG ELECTRIC CO., LTD.

Service Targets 1995

Supply of Electricity Reliability Rating	Better than 99.995%
Response to Emergency Calls Average arrival time to scene in urban areas	Less than 30 minutes
Connection to Supply Source Not Requiring Inspection Connection of Supply	Within the next working day
Inspection for Connection of Supply Provision of printed inspection report	In-situ immediately after each inspection
Special Request on Meter Reading Taking of the meter reading	Within the next working day
Counter Services at our Customer Centre Average waiting time for counter services	Less than 3.5 minutes
Telephone Enquiry Services Average waiting time for telephone enquiry services by Customer Services Representatives	Less than 10 seconds

Exhibit 3

Paper No. 9

PROPOSED ELECTRICAL PRODUCTS (SAFETY) REGULATION

Speakers : T.P. Uy, Chief E&M Engineer, &
W.H. Sit, Senior E&M Engineer,
Electrical & Mechanical Services Department
Hong Kong Government

PROPOSED ELECTRICAL PRODUCTS (SAFETY) REGULATION

T.P. Uy, Chief E&M Engineer, &
W.H. Sit, Senior E&M Engineer,
Electrical & Mechanical Services Department
Hong Kong Government

ABSTRACT

This paper covers the major provisions in the proposed Electrical Products (Safety) Regulation which is now being prepared by the Hong Kong Government to enhance public safety in the use of household electrical products.

The Regulation will require all household electrical products to comply with certain prescribed safety requirements, which are intended to ensure, during normal use of the product, that the user is protected from hazards which may arise from it. It will also require that a household electrical product, before it is supplied, is issued with a "Certificate of Safety Compliance" certifying that it is designed and manufactured to meet the prescribed safety requirements.

In this paper, the background, application, classification of electrical products, prescribed safety requirements, criteria of certificate of safety compliance, responsibilities of the suppliers/ manufacturers, consumers, testing and certification bodies, as stipulated in the proposed Regulation, will be explained.

1. INTRODUCTION

Electricity is a highly valued form of energy. Its flexibility, multitude and simplicity of uses, ease and speed of transportation, and unparalleled cleanliness in end use make it one of the most sought-after forms of energy. It is little wonder that electricity has been the fastest growing form of energy used in the world for several decades. In 1950's, an electric lamp might be the only electrical product in a family in Hong Kong and an electric fan or radio was well treated as a luxury possession. Today it may be difficult for us to find a family in Hong Kong which has less than 10 items of electrical products. You may not be surprised to know that, in 1994 alone, over HK$60 billions of household electrical products were imported into Hong Kong. From this figure, we can see how much our daily life is geared to use of electrical products.

While we enjoy the benefits arising from the use of electricity, we should not neglect its potential dangers. In 1994, there were a total of 24 severe electrical accidents, of which 13 were related to the use of electrical products. Furthermore, there were 1189 nos. of fire accidents in buildings in 1994 which were suspected to have an electric origin. The Government is well aware of the situation and thus has introduced a series of legislative measures to enhance statutory control over the use of electricity.

The Electricity Ordinance (Cap. 406) was enacted in 1990 to enhance safety in the use of electricity. The major sets of subsidiary legislation made under the Electricity Ordinance include the Electricity (Wiring) Regulations, Electricity (Registration) Regulations and Electricity Supply Regulations which all aim at safe delivery of electricity.

A new set of subsidiary legislation under the Electricity Ordinance, which will be cited as the Electrical Products (Safety) Regulation (EPSR), is under preparation to give control over safety of both locally manufactured and imported electrical products designed for household use. This set of regulation is scheduled to be introduced to LegCo early next

year and a grace period of 12 months after its enactment will be allowed for the trade and the consumers to get acquainted with the new statutory requirements. Consultation on the proposed legislation was conducted in early 1994 and the Hong Kong Institution of Engineers is also one of the organisations which have offered comments on the proposals. Here, I would like to thank the HKIE, in particular its Electrical Division, for their valuable contribution.

In response to growing public concern on the safety of plugs and adaptors, the Plugs & Adaptors (Safety) Regulation was enacted on 23.9.1994 to give advance control over the safety of plugs and adaptors. This set of regulation will be repealed when the EPSR is brought into effect as the EPSR will provide control over all household electrical products including plugs and adaptors.

2. THE OBJECTIVE

The objective of the proposed regulation is to enhance public safety in the use of the household electrical products.

The means for the new regulation to achieve the objective are:-

(a) prescribing safety requirements for them;

(b) requiring suppliers to ensure that their products comply with the prescribed safety requirements and requiring the issue of a certificate of safety compliance for every model of electrical products; and

(c) requiring suppliers of products which do not meet the prescribed safety requirements:-

  (i) to notify the persons to whom they have supplied the products of the hazardous defects in the products;

  (ii) to accept a return of the products; and

  (iii) to refund any sum paid for the products.

3. APPLICATION

This proposed regulation will apply to any electrical product which is:-

(a) designed for household use; and

(b) supplied for use in Hong Kong (whether it is imported or manufactured locally).

This regulation will not apply to electrical product which is:-

(a) under transhipment or in transit through Hong Kong;

(b) manufactured for export from Hong Kong;

(c) supplied for reconditioning; or

(d) supplied as scrap.

4. MEANS FOR COMPLIANCE WITH THE REGULATION

The Regulation will stipulate a number of statutory requirements as follows:-

(a) *Compliance with Safety Requirements*

Under the proposed Regulation, the suppliers shall ensure that their electrical products are in compliance with the prescribed safety requirements. Electrical products will be classified into prescribed and non-prescribed products. Both types of products will be required to comply with the essential safety requirements (ESRs) stipulated in the Regulation which are developed based on the Low Voltage Directive adopted in the European Communities for the control of electrical product safety.

Prescribed products are those products that are of special nature and identified by the Director of Electrical & Mechanical Services (the Director) that the essential safety requirements may not be sufficient to protect the safety of the consumers. Therefore, in addition to the essential safety requirements, they have to comply with certain

specific safety requirements derived from international or national standards and such specific safety requirements will also be clearly stipulated. Initially, prescribed products will include the following six types of products, but as and when necessary, more prescribed products will be introduced.

Classification of Electrical Products	
Prescribed Products	Non-Prescribed Products
1. Plugs	All household electrical products other than the 6 types of prescribed products
2. Adaptors	
3. Extension Units	
4. Lampholders	
5. Flexible Cords	
6. Unvented Thermal Storage Type Electric Water Heaters	

In order to provide guidance to the suppliers on how their products can comply with the prescribed safety requirements, the Director will publish a set of Guidance Notes in which the relevant international/national standards will be listed. Products complying with the standards listed or those standards which are compatible to the listed standards are deemed to satisfy the safety requirements of the regulation. In general, electrical products which meet IEC (International Electrotechnical Commission) standards are deemed to satisfy the prescribed safety requirements. The Director will also describe the technical guidelines in the Guidance Notes on how the prescribed safety requirements can be met.

(b) *Verification of Compliance with Safety Requirements*

In order to allow the suppliers to demonstrate their electrical products complying with the safety requirements, the proposed Regulation will also require that every model of electrical products must be issued with a certificate of safety compliance before it is supplied to the market. For prescribed products, the following test certificates/ reports will be accepted as certificate of safety compliance:-

(i) test certificates/reports issued by a "recognised certification body"; or

(ii) declaration of conformity issued by a "recognised manufacturer".

For non-prescribed products, the following test certificates/reports will be accepted as certificate of safety compliance:-

(i) test certificates/reports issued by a "recognised certification body";

(ii) declaration of conformity issued by a "recognised manufacturer"; or

(iii) a self declaration of conformity issued by the product manufacturer.

The models of electrical products should have been issued with a certificate of safety compliance before they are supplied. In practice, this means that every model of household electrical products will have to be certified that it has been tested and found to be in conformity with certain standards. Those endorsed test certificates or test reports adopted in international trade will be accepted as the certificate of safety compliance. The electrical products that have been tested for such purpose will not have to be tested again for compliance with HK's regulatory requirements in this aspect. The information to be contained in the certificate of safety compliance is detailed in Section 6.

5. THE CONCEPT OF ESSENTIAL SAFETY REQUIREMENTS

The essential safety requirements (ESRs) are based on the Low Voltage Directive (LVD) adopted in the European Community and received general support in the consultation exercise during 1994.

The LVD is to ensure under normal use, the users' protection from :-

(a) Electrical shock due to direct contact;

(b) Risk of fire or explosion due to over-heating;

(c) Personal injury due to loosened parts or overheated surfaces which are to be touched in using the electrical appliances;

(d) Danger due to improper use on account of lack of proper information; and

(e) Danger due to hazardous materials used in electrical appliances.

The proposed ESRs are listed at Schedule I.

6. CERTIFICATE OF SAFETY COMPLIANCE

A certificate of safety compliance shall be issued in respect of an electrical product before it may be supplied.

A certificate of safety compliance shall include the following information:-

(a) Certificate reference number or test report reference number;

(b) Name and model/type reference of the product;

(c) Name and address of the manufacturer;

(d) Name and address of the person or company who requested testing of the product;

(e) The international or national standard(s) to which the product was tested and found to be in conformity with;

(f) Name, address, authorised signature or company seal of the recognised certification body or recognised manufacturer; and

(g) Date of certification.

7. ISSUANCE OF CERTIFICATE OF SAFETY COMPLIANCE

The following certificates or test reports issued by the corresponding organisations which have been registered by the Director as recognised certification bodies or recognised manufacturers will be accepted as the certificate of safety compliance:-

(a) CB test certificates issued by national certification bodies participating in the CB Scheme of IEC System for Conformity Testing to Standards for Safety of Electrical Equipment (IECEE);

(b) Endorsed test certificates issued by the testing laboratories accredited by The Hong Kong Laboratories Accreditation Scheme (HOKLAS) under the test category of electrical and electronic products;

(c) Endorsed test certificates or test reports issued by the testing laboratories which have been accredited by those bodies which have mutual recognition agreements with HOKLAS under the test category of electrical and electronic products; or

(d) declaration of conformity issued by a "recognised manufacturer".

A self-made "declaration of conformity" by the product manufacturer of a non-prescribed product will be accepted as a certificate of safety compliance provided the information contained in such "declaration of conformity" is not less than the information required under Section 6, whichever applicable.

However, the Director will be empowered not to recognise any declaration of conformity made by a manufacturer who has been found to have made a declaration of conformity for an electrical product which does not comply with the prescribed safety requirements. He will also be empowered to publish the names of such manufacturers in the Gazette.

8. RESPONSIBILITIES AND DUTIES OF VARIOUS PARTIES

In order to ensure smooth implementation of the new legislation, every party must undertake its own responsibilities and duties:-

i) *The Supplier/Manufacturer*

A supplier/manufacturer will be required to make sure that the electrical products that he supplies are in compliance with the safety requirements. It is the responsibility of the suppliers/manufacturers to ensure a certificate of safety compliance has been issued for their electrical products.

iii) *The Government*

The Director, on behalf of the Government, shall administer this Regulation and publish a set of Guidance Notes to the suppliers/ manufacturers on how their electrical products can comply with the prescribed safety requirements.

Publicity campaign and public education will be arranged by the Director to enhance public understanding of the proposed Regulation. When the Regulation is enacted, the Director will take a proactive approach to enforce the new legislation by means of carrying out spot check in the market to make sure that the Regulation is followed. He will also react on complaints and accidents related to electrical products and take legal action against those offenders.

iv) *The Consumer*

If an electrical product is found not in compliance with the safety requirements, the Director shall prohibit its sale or use under the Regulation. It is the consumer's responsibility, for his own personal safety, not to use the sub-standard electrical product which has been prohibited by the Director. The consumer shall also check with the suppliers to make sure that the electrical products they intend to purchase have been issued with a certificate of safety compliance.

v) *The Testing and Certification Body*

Upon the enactment of the regulation, there would be more business transactions between the manufacturers/suppliers and the testing and certification bodies. It is the responsibility of the testing and certification bodies to ensure that the certificate of safety compliance issued by them are valid.

9. PENALTIES

Any person who contravenes the new statutory requirements commits an offence and is liable to a maximum fine of $100,000 and to imprisonment for 1 year on first conviction and a fine of $500,000 and to imprisonment for 2 years on a subsequent conviction for the same offence.

10. CONCLUSION

The success of a new legislation depends greatly on the understanding and acceptance of the public. As the responsible sector in the community in handling electricity matter, you are called upon to offer your valuable professional advice and support for dissemination of the new statutory requirements to the public. I am sure that with your support, the proposed Regulation will successfully achieve its objective in enhancing the public safety in the use of electrical products.

Paper No. 9

Schedule 1

ESSENTIAL SAFETY REQUIREMENTS (ESRs)

All electrical products shall comply with the following essential safety requirements:-

(A) *General Conditions*

(a) The essential characteristics, the recognition and observance of which will ensure that electrical product will be used safely and in applications for which it was made, should be printed on the product in Chinese, English or international standard symbols; or, if this is not possible, on an accompanying notice. Such information should include:-

(i) rated voltage and frequency;

(ii) rated input in terms of watts or kilowatts and amperes or milliamperes;

(iii) model or type reference number; and

(iv) manufacturer's name or trade mark.

(b) The electrical product, together with its component parts, should be made in such a way to ensure that it can be safely and properly assembled and connected.

(B) *Protection Against Hazards Arising from the Electrical Product*

The product should be so designed and constructed in order to ensure:-

(a) That persons and domestic animals are adequately protected against danger of physical injury or other harm which might be caused by electrical contact, direct or indirect;

(b) That temperatures, arcs or radiation which is not part of the intended function of the product and would cause dangers, are not produced;

(c) That persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical product;

(d) That persons and domestic animals are adequately protected against dangers due to hazardous materials used in the electrical product; and

(e) That the insulation must be suitable for foreseeable conditions.

(C) *Protection Against Hazards which may be caused by External Influences on the Electrical Product*

The product should be so designed and constructed in order to ensure:-

(a) That the electrical product meets the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered;

(b) That the electrical product should be resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered;

(c) That in foreseeable conditions of overload the electrical product should not endanger persons, domestic animals and property; and

(d) That the electrical product, other than fixed and hand held products, should have adequate stability to prevent the electrical product from overturning which may cause hazard.