IMPOSING ISO 9000 QUALITY ASSURANCE SYSTEM ON STATUTORY AGENTS IN HONG KONG

By Edwin H. W. Chan[1] and Antony T. S. Chan[2]

ABSTRACT: A major part of the building control system in any country has to do with quality assurance (QA) of building the process and the products. As in many other countries, the government of the Hong Kong Special Administration Region delegates part of its statutory role to statutory agents to deal with the QA function. As a case study in the context of the Hong Kong construction industry, the relationship between QA and the role of statutory agents is investigated. An authorized person (AP), normally an architect, is the statutory agent as an integral part of the property development control system in Hong Kong. Although AP's statutory roles have already been recognized, their formal roles in respect of QA have never been studied. This paper, being supported by a research project carried out in 1997, presents the result of a study on the relationship between the QA system and the AP practice. The research revealed that in the APs' professional practice most of them have a basic concept and awareness of QA. Their checklists to run projects are similar to a QA manual. To discharge their statutory duties APs are already performing most of the QA standards similar to the ISO 9001 requirements. This paper concludes that the ISO 9000 requirements could be an extra administrative burden to a statutory agent.

INTRODUCTION

Quality Assurance (QA) of Building and Statutory Agent

Building control systems in most countries are incorporated with some forms of QA mechanism to control the quality of buildings to be created, used, maintained, and eventually disposed of with the public interest and safety in mind. The interdependent relationship between building control and QA systems is well recognized. In a conference on building control issues, Visscher et al. (1996) introduced a conceptual model showing a building control system with the hierarchy of control and supervision supported by the ISO 9000 quality system. A comprehensive and supportive building control system must maintain a framework for (1) building law—providing regulations, statutory instruments, and codes of practice (could be on performance or prescribed basis); (2) maintaining a building control institution backed up with fair administrative provisions; (3) accreditation of test laboratories and materials or products of a third party; (4) delegation of power to the private sector—involving professional registration of statutory agents; (5) promoting education and setting standards with constant review through research and development; (6) making available a reasonable professional liabilities insurance scheme to protect consumers; (7) law reform—reviewing legislation to cap tort and statutory liabilities to a reasonable level acceptable to society; and (8) an objection and appeal mechanism with transparency and public participation in the administration. Normally, government authorities will administer the QA mechanism as part of the building control system (Chan 1998).

Government authorities cannot carry out all duties to ensure quality of buildings to be delivered. The two aspects of maintaining a fair building control institution and delegation of power in an ideal building control system are directly related to delegation of authority and control of professional statutory agents to share the role of government in building control. Through professional registration and licensing, government delegates part of its statutory role to statutory agents. This happens in the building control systems of many countries such as the approved inspectors in the United Kingdom, the certified checkers and qualified persons in Singapore, the approved private certifiers in Australia, and the authorized persons (APs) in Hong Kong. In some countries such as Australia and the United Kingdom, even privatization of the whole building control function for new property development has been introduced (Lovegrove 1997). In all cases, the major duties of these statutory agents are to share the QA function of the building control system in their countries. This paper is a study of the Hong Kong case to investigate the interdependent relationship between the function of statutory agents and the QA system for building works. Such an interdependent relationship exists in the building control systems of many countries. Findings of the investigation will be of interest to many countries with a similar building control system to that of Hong Kong.

Statutory Agent in Hong Kong

In the building control system of Hong Kong, an AP is one of the statutory agents of the government's Buildings Department. By virtue of Section 2(1) of the Buildings Ordinance (Chapter 123), " 'authorized person' means a person whose name is on the authorized persons' register kept under section 3(1) (a) as an architect; (b) as an engineer; or (c) as a surveyor."

Hong Kong has long developed a unique building control system involving the government and private sectors. Delegation to the private sector is primarily based on registration of qualified building professionals and self-regulations by the respective registered professionals. These are backed up with statutory administrative measures (Fig. 1).

The role of APs in the Hong Kong construction industry is to enhance the building control functions by introducing more checks and controls into the two major stages of a building project, namely, the preconstruction and construction stages. Under the current Buildings Ordinance and the allied Regulations, the APs' main duties are to ensure compliance with Buildings Ordinance, to supervise the carrying out of the work, to notify in case of any contravention to the relevant statutory requirements, to prepare supervision plans, and to certify compliance with Buildings Ordinance for building/street works.

QA System in Hong Kong Construction Industry

QA has been a controversial issue in the 1990s (Chan 1996; Yates and Aniftos 1997). The awareness of QA in the Hong

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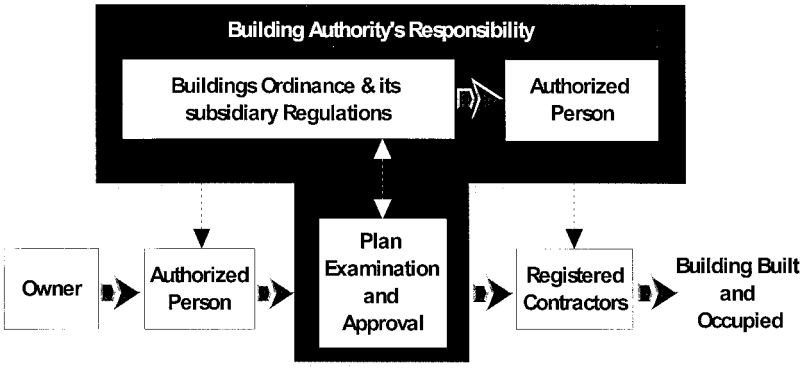

FIG. 1. Typical Hong Kong Building Control System Model

Kong construction industry has been increasing as a result of the launch of the QA campaign by the Hong Kong government in March 1990 (*Construction* 1991). Recently, government departments such as the Works Bureau are requiring architectural firms and associated consultants to be ISO-certified as a prerequisite for inclusion of the government's consultant list (Works 1997). An increasing number of firms, including architectural, consultancy, engineering, as well as contractors, have already obtained the ISO 9001/9002 certification. The following shows the numbers of construction-related firms certified to the ISO 9000 in the Hong Kong construction industry (*Buyer's* 1997). Not all categories such as lift installation contractors are included in the following statistics. It is possible that the same company may be certified in more than one category as follows:

- Building new works—86
- Building maintenance—68
- Civil engineering new works—55
- Civil engineering maintenance—9
- Concrete products—64
- Construction material supplier—12
- Civil and structural engineering consultancy—43
- Piling/foundation—21
- Architectural consultancy—37
- Building surveying consultancy—3
- Quantity surveying consultancy—15
- Land surveying consultancy—1
- Real estate consultancy—4
- Town planning consultancy—2

The QA certification is applied to corporate level. It does not concern individual professional practice. In recent years, there are queries about the effectiveness and reliability of the QA system in respect of its actual operation in the construction industry (Griffith 1987; Emmitt et al. 1996; Watson 1997).

Effect of QA on Statutory Agents

The quality of works performed by the building professionals has long been a concern (Ritsema van Eck-van Peet et al. 1992; Abdul-Rahman 1996). In Hong Kong, an amendment to the Buildings Ordinance was passed in 1996 to improve the quality, safety, and progress of work. This in turn extended the liability of APs and aroused concern, particularly in the area of site supervision (Chan and Leung 1997). Under the current legislation, APs have extensive roles on building control matters concerning building projects from scheme design stage to the occupation permit (OP) approval stage. In recent years, the government's mandatory requirement of construction-related firms to be ISO certified has created a problem, particularly for small construction-related firms. For those small consultant firms operated by a sole AP, ISO certification would seem to be an extra administrative burden on top of their statutory roles in ensuring the quality of building works under the building control system.

Scope of Study

This paper is based on a case in Hong Kong to investigate the roles of a statutory agent in relation to QA. The study also analyzes the current Buildings Ordinance and Regulations with respect to the QA standards. The findings of this study will serve as a reference for other countries with a building control system similar to that of Hong Kong. In Hong Kong, the prevailing QA standard adopted is the ISO 9000 system, which is widely used in the Hong Kong construction industry. This study limits the scope to the ISO system and focuses on project level instead of company level. The study is related to the ISO 9001 as it deals with QA in design, development, production, installation, and servicing in which the APs are involved as statutory agents. Research was carried out by Chan and Leung (1996; 1997) on the professional practice and liabilities of APs. Yet, little in-depth study has been carried out with respect to the statutory roles played by the APs in relation to problems encountered in the implementation of QA. This research project aims to answer such questions and to draw up some recommendations.

RESEARCH METHODOLOGY

Literature Review

The research idea was developed based on literature review and detailed examination of the AP and the QA systems. There being no previous research carried out in this area, a comparison between the two systems contributes to a better understanding of their respective structures and similarities.

Conceptual Model

A model was developed to conceptualize the ideas stemming from the comparison of the two systems (Fig. 2). Owing to the complexity and nature of the two systems, the property development control process is used as the backbone and the ISO requirements are linked with the statutory obligations of APs for a comparison.

Data Collection

A questionnaire survey (hereinafter known as ''the survey'') was conducted. A three-page questionnaire was sent to 150 APs representing 15% of all APs. The mailing list was randomly drawn from the directory of APs and Registered Structural Engineers issued by the Buildings Department in 1997. The list comprises a total of 996 APs of architects, engineers, and surveyors who are registered under the Buildings Ordi-

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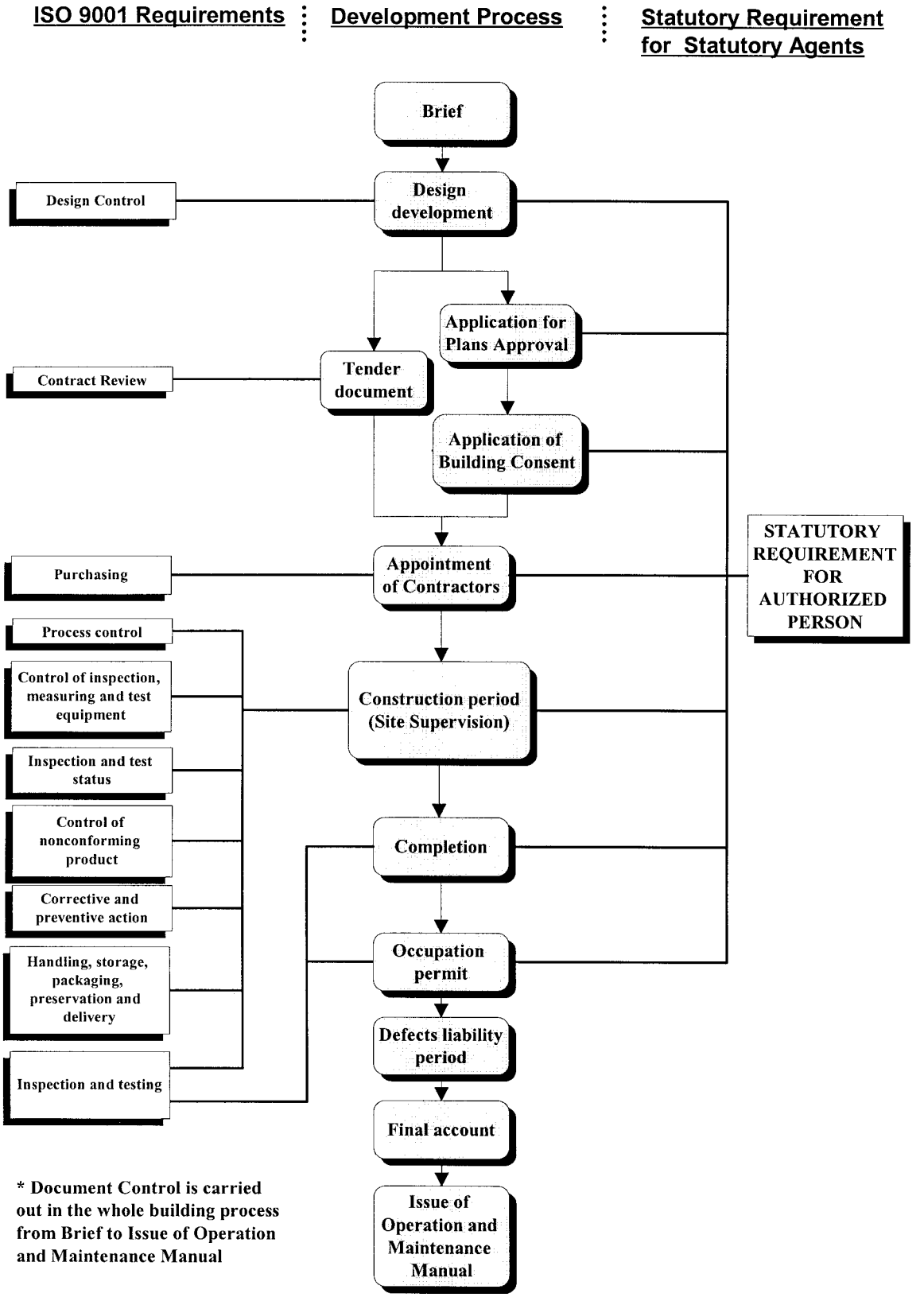

FIG. 2. Conceptual Model

nance. This paper describes and analyzes the 65 responses out of the 150 target samples, representing a favorable response rate of 43%. The questions reported here are in their original text but in different sequential order from the original questionnaire. Fig. 3 shows the spread of the respondents among the three professional disciplines of architecture, engineering, and surveying.

Analysis of Result

After preliminary analysis of the survey results, five individual interviews were conducted. The aim of the interviews is to reconfirm their answers to the questions with detailed explanations on the spot and to seek comments on the preliminary conclusions based on the questionnaire survey results.

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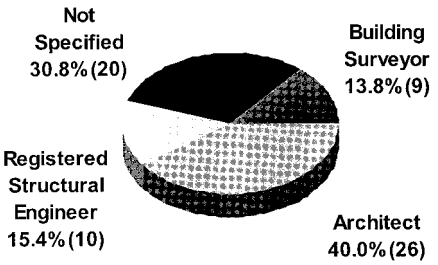

FIG. 3. Category of Respondents

The target sample size might be small, but the response rate was very high. The total number of respondents accounts for 6.5% of all the APs in Hong Kong. The result could serve as an indication of the views of statutory agents. The following are the significant results and discussions on the questionnaire survey.

RESEARCH RESULTS

From the research results, a number of significant issues were identified and discussed as follows:

Issue No. 1—Accreditation to ISO 9000

The survey indicated that 45% (29) of the respondents' companies had been accredited with the ISO 9000 certificates (Fig. 4). It was noted that the ISO 9000 QA system was only in its infancy in Hong Kong. There was still no wide acceptance of QA, particularly in the Hong Kong construction industry (Shen et al. 1995). Although the number of ISO 9000-accredited firms was small, it amounts to a significant figure at this stage. It was also observed that the majority of the ISO-certified companies were large firms with more than 20 staff members. Of the 29 respondents with the ISO 9000 certification, 20 were large firms, amounting to 68.9%.

Issue No. 2—ISO 9000 Training for APs

More than 46% (30) of the respondents had attended some training courses of the ISO 9000 system (Fig. 5) which indicated that the AP's awareness of the ISO 9000 system was fairly significant. With the launch of the ISO 9000 awareness campaign and subsequent to the government departments' request upon their consultants/contractors for the ISO certification, building professionals including the APs became keener in acquiring the ISO 9000 knowledge.

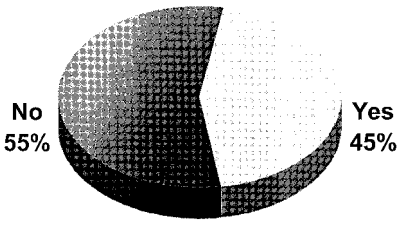

FIG. 4. Issue No. 1: Your Company Has Been Accredited to ISO 9000

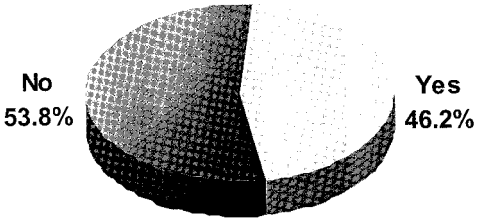

FIG. 5. Issue No. 2: You Have Attended Training Course of ISO 9000 System

Issue No. 3—QA Is Same as Quality Control (QC)

From the survey, 13% (20) of the respondents thought that QA was synonymous with QC because both concepts shared the same objective (i.e., to achieve quality products or services). On the other hand, 87% (45) of the respondents disagreed that QA was the same as QC (Fig. 6). The former concept is concerned with all those planned and systematic actions necessary to provide adequate confidence that a product/service will satisfy the given requirements for quality. The findings of the survey provided a cross-check that most of the APs were aware of the basic differences between QA and QC.

Observation from Issue Nos. 1–3

From answers concerning the first three issues, it is obvious that a large proportion of the respondents has a clear basic concept about QA and QC because most of their daily work is associated with the QA system. All in all, there is increasing awareness among APs of QA. There are also more larger firms that are ISO 9000 certified than small ones.

Issue No. 4—Government's Requirement of ISO Certification from Small Consultant Firms

From the survey, 37% (24) of the respondents agreed that the government's action in requiring construction-related consultant firms to be ISO certified, as a prerequisite to be included in the government's consultant lists, was unfair to the small firms (Fig. 7). Those responding with ''No'' to the question were expecting the same treatment for any firms even if the small ones could not afford the resources to set up the ISO 9000 system.

Observation from Issue No. 4

Out of the 41 respondents disagreeing with the statement, at least 22 (53.7%) were large firms. In discussing Issue No. 1 above, it was revealed that most (69%) of the ISO 9000 accredited firms were large firms. This set of data corresponded with the fact that large firms, which were ISO 9000 accredited for genuine operational need and to satisfy government project requirements, were not showing any sympathy for small firms finding it difficult to obtain ISO 9000 certification. Small firms are required to comply with the same ISO 9000 certification as large firms. This notion was in fact imposed upon or influenced by the general view of large firms, which might only be speaking for their self-interest.

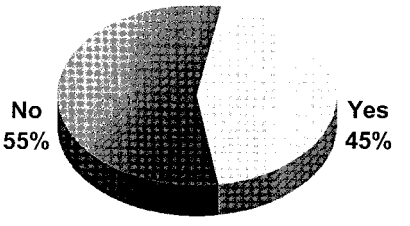

FIG. 6. Issue No. 3: You Agreed that QA Is Same as QC

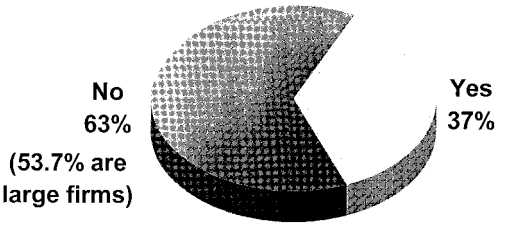

FIG. 7. Issue No. 4: You Agreed that Government's Action in Forcing Small Construction-Related Firms to Obtain ISO 9000 Certification Is Unfair Action

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During a follow-up interview in the survey, it was observed that most of the statutory agent consultancy firms usually had their own well-established policy and procedures similar to that of the ISO 9000 system. To accommodate well-managed small firms within the culture of the ISO 9000 quality management system, some forms of incentive scheme could be introduced and incorporated into government administrative regulations for tendering works/consultancy contracts. Based on the experience in Singapore (Low and Tan 1997), an inventive scheme could operate in such a way that a benchmark with respect to the value of the works/consultancy projects could be established and incorporated into government departments' tendering rules. If the contract sum of a project is above the benchmark value, ISO certification is a prerequisite for any firm/company to tender for government jobs but not if the contract sum is below the value. This incentive scheme could be made more viable with the backup of a corresponding amendment to the Buildings Ordinance to be discussed in Issue No. 7 below.

Issue No. 5—Attitudes toward Burden of Responsibility for QA

Apart from the liabilities laid down in their appointment agreements with their clients, the major concern on liability for APs is their statutory responsibility on design and supervision of street/building works prescribed by the Buildings Ordinance. To create statutory responsibility for QA under building regulations, the APs would be exposed to more liabilities. As indicated from the survey, 69% (45) of the respondents were of the opinion that statutory responsibility for QA would impose upon them extra and heavy liabilities (Fig. 8).

Observation from Issue No. 5

It seems that the QA scheme is not a ''facilitator'' but a burden for the APs to discharge their professional duties. Some of the respondents added their comments that the new Buildings Ordinance was already too burdensome in the area of APs' liability, particularly on site supervision of building/street works. In addition, it was expected that workload on extra paperwork for the QA system would be increased. Because of this reservation, 69% of them were unwilling to carry extra statutory responsibility for QA of building works although about half of the respondents were ISO certified.

Issue No. 6—Checklists Being Used by APs

Of the respondents, 83% (54) replied that they had some sort of checklists/job books for projects to help their QC processes covering all stages from scheme design to OP approval. These checklists/job books were the important job companions for APs.

Observation from Issue No. 6

During the interviews, it was noted that one of the largest, well-established architectural companies in Hong Kong had already developed a job book for all of their projects long before they obtained the ISO 9001 quality management system certification in July 1996. This job book comprised all the necessary procedures and information related to all stages of works from feasibility/outline proposals to the issuing of a building operational manual. Similar to many formal practice guides used in other countries such as the Royal Institute of British Architects job book, the job book served as a guide and checklist on the normal procedures for running a job from start to finish. It was also used in conjunction with the architectural company's office policy book, materials and workmanship information, standard drawings, and specifications. The company had already incorporated ''quality'' issues into all of their project management before the ISO 9000 certification. The QA concept was formally launched in Hong Kong in 1990. The company did not seek to obtain the ISO 9000 certification until late 1996. This was not due to their slow response to the ISO 9000 system; it was mainly because they had already been running their projects with their well-established procedures and policy, similar to the QA manual. Moreover, as disclosed by another interviewee, his company ultimately obtained the ISO 9001 certification primarily because the government requires the ISO certification as a prerequisite condition for architectural and associated consultants to be included in the government's consultant lists, not for the underlying benefits of the system. It seemed that provisions had already been made in most of the statutory agents' office manual and policy and administrative framework to assure quality of works to accomplish their statutory duty.

Comparison of APs' Own Checklists with ISO 9001

By comparing the APs' project working procedures from scheme design to OP stage with the ISO 9001 requirements at project level, to a certain extent the APs have been performing the ISO requirements. In the survey, the respondents were asked to identify from their standard office checklists those items related to QA of building projects (Fig. 9). Most of the respondents included design control, contract administration, document control, tender procedures, procedures for statutory procedures, and inspection items. All of these were exactly the ISO 9001 requirements and had been included in most of the APs' office checklists. Over half of the respondents confirmed that project quality plan, procedures for controlling and correcting nonconformances and defective works, and assessment of contractors' performance had also been included in the checklists. It was also noted that only half of the respondents indicated that internal audit had been included in the checklists.

The survey showed that APs' normal working procedures were most likely to be included in their office checklists. Among the items in the checklists, it was interesting to note that only 43% of the respondents' companies had been ISO certified, and yet 63% of them had project quality plans included in their checklists to control quality of their projects. To facilitate building plans approval by government departments and to discharge their statutory duties, these checklists were necessary so that any cross-reference of project information could be made at short notice and quality controlled easily.

Issue No. 7—Attitudes toward Modifying Current Legislation into Statutory Requirement for APs to Implement QA

The survey results showed that 56% of the respondents disagreed that the current legislation could be modified to incorporate a statutory requirement for the APs to implement QA in construction projects. Only a handful of the respondents (14%) agreed with the proposition and 25% were neutral (Fig. 10).

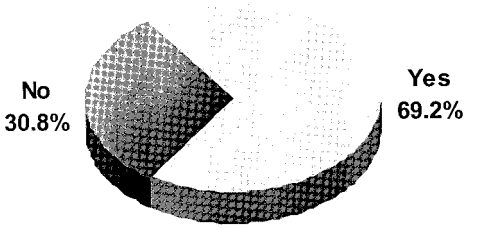

FIG. 8. Issue No. 5: You Think You Will Carry Extra and Heavy Liability if You Are Required to Be Responsible for QA

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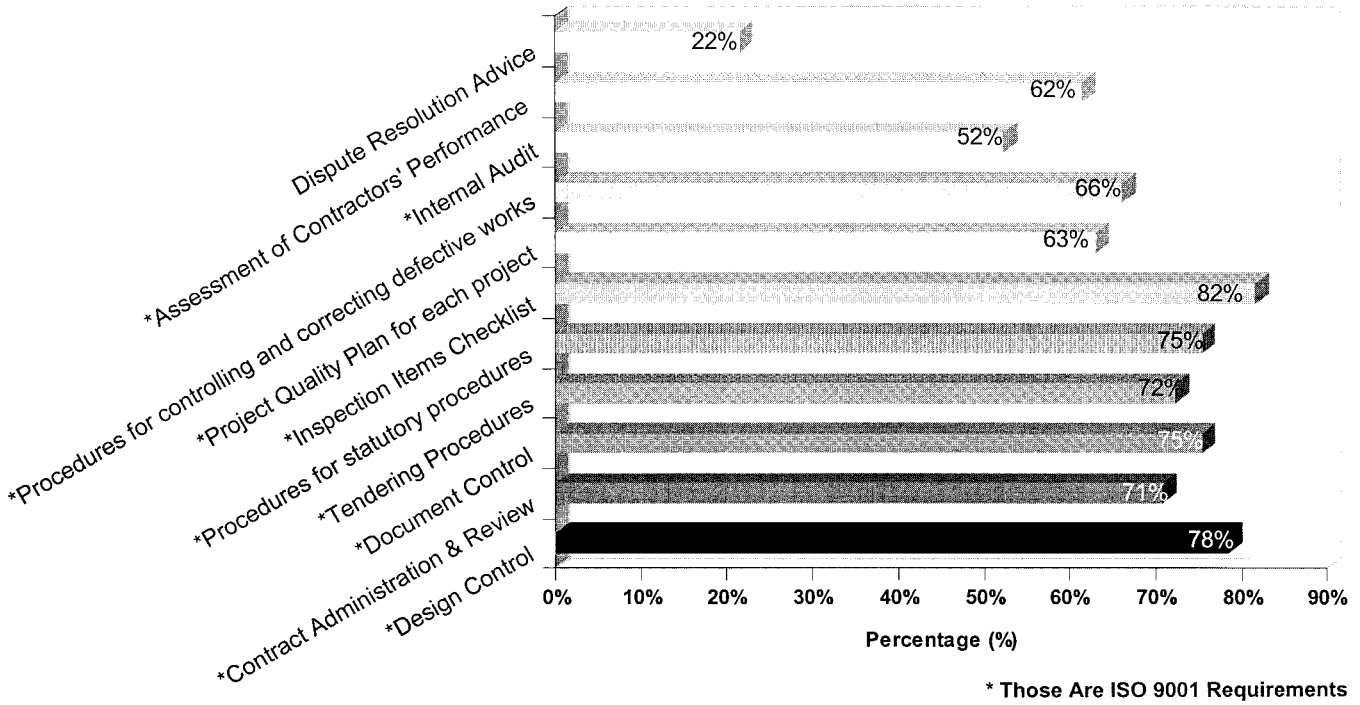

FIG. 9. Issue No. 6: Items Contained in APs' Own Checklists

Observation from Issue No. 7

The results of all the previous issues tend to show that the statutory agents were conscientiously carrying out the QA function to discharge their statutory duties. Issue No. 7 aimed at testing a new concept of formalizing the role of statutory agents on QA of building works by having such role written into the legislation. The survey result was a mixed message. The response for this statement could be accounted for in two ways. On the one hand, the respondents were already running scared of any new regulations that would impose liability on them. In view of the long lasting struggle against the heavy elements of liabilities proposed in the Buildings Ordinance (Amendment) No. 3 Bill 1995 (Ho 1996), it is expected that this quality-oriented modification of the Buildings Ordinance would receive negative response from the respondents. A respondent, during the interviews, commented that any changes, even to the least extent, on the current statutory roles of the APs would not only affect a particular project but also the whole industry. On the other hand, workload, cost, and time devoted to the process of QA implementation were also the prime reasons for rejecting the proposed statutory role of APs to implement QA. After interviewing a few of respondents, the writers were of the opinion that the Buildings Ordinance could be modified to a certain extent to incorporate some of the ISO 9001 requirements. In return for taking up extra statutory responsibility, no further ISO certification is required of any firms operated by APs provided that the contract sum of a project does not exceed a specified cost limit. This incentive scheme would be feasible and practical, particularly for those small-scale projects undertaken by the small practices with the involvement of the APs who do not have enough resources to set up the QA system.

It would be interesting to draw comparisons with the practice of other professionals such as doctors and lawyers. A practicing lawyer has to practice in accordance with his professional code of conduct and most importantly the statutory obligations laid down in the relevant legislation. In addition, he also has his own office manual covering the company's policy and administrative procedures for normal operations. It is therefore obvious that very few, if any, legal firms would

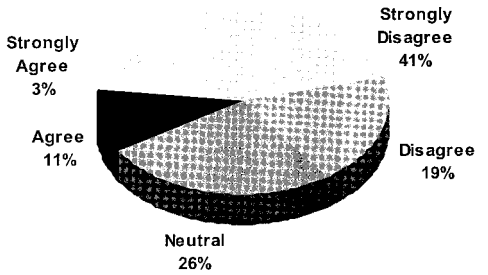

FIG. 10. Issue No. 7: You Agreed that Current Legislation Could Be Modified into Statutory Requirement for APs to Implement QA

seek ISO certification [information obtained from the Hong Kong Quality Assurance Agency *Buyer's Guide* (1997) as of February 20, 1997—only one legal firm is accredited to ISO certification]. It tends to show that lawyers being regarded as professionals of high social status would do their jobs guided by their professional judgment, codes of professional conduct, and the statutory requirements. People who need the services of lawyers would trust that they are capable of delivering competent and quality services based on the lawyers' professional competence and legal obligations rather than their ISO certification. The same argument applies to medical clinics, particularly small clinics run by registered medical doctors. Seldom will a patient look for ISO certification from a doctor to establish his trust on the doctor's quality of services.

By the same token, APs who act as statutory agents have recognized professional competence. They are registered as an AP under the Buildings Ordinance after passing the tests held by the APs' Registration Board. Their capability and competency in the construction industry are recognized by peer professionals, clients, and, of course, the government. The ISO certification would therefore seem to be just an extra administrative burden for them. If QA matters have to be reinforced, the current legal provisions can be modified to include a statutory requirement for the APs to implement QA. It would be more practical than obliging themselves to an extra set of QA procedures to get the ISO certification.

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Issue No. 8—Observation from International Aspects

This study has investigated the relationship between the function of statutory agents and the QA system for building works. It has examined the effect if a QA system was imposed on statutory agents—the AP in Hong Kong. Statutory agents in various names or roles exist in the building control system of many countries such as the approved inspectors in the United Kingdom, the accredited checkers and qualified persons in Singapore, and the approved private certifiers in Australia. Under the building control system in their respective countries, one of the major duties of the statutory agents is to ensure quality of building works. Their statutory roles in building control and their professional relationship with the QA system for building works are similar to the statutory agent (the AP) in Hong Kong. This research could serve as a reference for these countries. It should prompt each of these countries to consider, according to their specific circumstance, the appropriateness of imposing a ISO 9000 QA system on their statutory agents for building works.

RECOMMENDATIONS

This research has created a valuable source of raw data and observations that can be utilized for further research. Further areas of study related to the statutory agents and QA are identified as follows:

- The conclusions in this research are partly based on a relatively small sample size. A similar research but with a sample size covering all the statutory agents should confirm these conclusions for government to take concrete action.
- A similar research, involving several countries, on the relationship between QA and statutory agents of similar building control systems would cast some doubt on or reconfirm as a worldwide issue the usefulness of the ISO 9000 QA system for statutory agents for building works.
- Further research should be undertaken to incorporate views from experienced building professionals of different disciplines, relevant government agencies, and clients/developers to investigate the inventive scheme mentioned in this paper for small statutory agent consulting firms.

CONCLUSIONS

Due to the contractual obligations in appointment agreements, statutory duties in building regulations, and ethical responsibilities laid down in their respective professional codes of conduct, statutory agents are more or less performing the requirements that the ISO 9001 prescribes for project administration. The ISO 9000 system would be very useful for large firms where coordination of a large number of extensive works will be facilitated by the system. It would, however, not be justified to impose the same requirements of ISO certification on the small consulting firms already operated by statutory agents to control quality of construction project. Instead of unnecessarily imposing the burden on small firms and thus threatening their very survival, it would be much better to improve the ''total quality'' image of the whole construction industry by incorporating into APs' statutory duties some of the key requirements of ISO 9000 certification.

ACKNOWLEDGMENTS

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