

**REPORT ON THE CSA
QUESTIONNAIRE ON BUILDING COMMISSIONING**

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Executive Summary

In July of 1991 CSA carried out a survey in the form of a questionnaire to obtain feedback on the practice of building commissioning across Canada.

The purpose of the questionnaire was to determine the level of support for the establishment of a program to develop a series of Canadian National documents on which commissioning could be based.

CSA's interest in the field of commissioning came about as a result of the recommendations outlined in the "Report of the Advisory Committee on the Commissioning of Buildings" issued by the Ontario Building's Branch.

The response to the questionnaire was excellent with a response ratio of 50%. The following summarizes the key conclusions drawn from the survey:

- There is a widespread need for improvement of building commissioning practice across Canada.
- There is a difference of opinion of the understanding of the process of commissioning. There is an indication that building commissioning should be considered synonymous with or a step towards total quality assurance for buildings.
- Current application of building commissioning varies widely across Canada.
- Need was expressed for a series of Canadian material documents of guidelines, on which commissioning could be based.
- Excellent support was indicated for development of documents under auspices of CSA.

A tabulation and summary of the response to each question in the questionnaire were extracted from this report and were sent to all of those who responded to the questionnaire. CSA is indebted to those who took the time and enthusiastically took part in the survey to make it a resounding success.

Résumé

En juillet 1991, la CSA effectuait, par voie de questionnaire, une enquête dans le but d'en savoir davantage sur la mise en service des bâtiments au Canada.

L'objet du questionnaire consistait à déterminer quel appui susciterait la mise sur pied d'un programme axé sur la rédaction d'une série de documents d'intérêt national sur lesquels se fonderait la mise en service.

L'intérêt que porte la CSA à ce domaine s'est manifesté par suite des recommandations formulées dans le rapport du comité consultatif sur la mise en service des bâtiments, publié par la Direction du bâtiment de l'Ontario.

L'enquête a donné lieu à un excellent taux de participation établi à 50 %. Voici d'ailleurs les principales conclusions tirées de l'enquête :

- ° Le besoin d'améliorer la mise en service des bâtiments est répandu partout au Canada.
- ° Il y a divergence d'opinion entourant la compréhension du processus de mise en service. Il semble que la mise en service des bâtiments devrait être considérée comme synonyme d'assurance de qualité totale des bâtiments ou comme un pas dans la bonne direction.
- ° À l'heure actuelle, la mise en service varie grandement au Canada.
- ° On a soulevé le point de rédiger une série de directives d'intérêt national sur lesquelles serait fondée la mise en service.
- ° L'élaboration de documents sous les auspices de la CSA recueille un excellent appui.

La tabulation et le résumé des réactions à chaque question de l'enquête ont été extraits du rapport en cause et transmis à tous les répondants. La CSA est redevable à tous ceux qui, grâce à leur participation enthousiaste, ont fait de l'enquête un succès retentissant.



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Purpose and Background

The purpose of the questionnaire was to obtain feedback on the practice of building commissioning across the country as seen by those most directly involved.

The origin of CSA's interest in this area came as a direct result of the "Report of the Advisory Committee on the Commissioning of Buildings" issued by the Ontario Buildings Branch of the Ministry of Housing. The report recommended that consideration be given to the establishment of a national program to develop the necessary documents that could be used by anyone wishing to have a building or any of its systems commissioned.

Financial support to carry out this survey was provided by the Ontario Building's Branch and Canada Mortgage & Housing Corporation.

Approach Taken

In July of 1991, the Canadian Standards Association (CSA) sent out a questionnaire to 135 individuals selected as being representative of a cross section of the construction industry in Canada.

The final count of the questionnaires sent out was 201. The increase over the original mailing was due to the response to one of the questions which asked for the names of others who might have been interested in responding to the questionnaire.

The Response

The response to the questionnaire was significant and indicative of a genuine and widespread interest in the improvement of building commissioning practices in Canada.

Of the 201 questionnaires sent out, a total of 100 individuals completed and returned the questionnaire; giving a response ratio of 50%.

CSA is indebted to all those who took the time to respond to the questionnaire and so make the effort a resounding success.

The following is a summary of the response to each question in the questionnaire. The "yes" or "no" type questions are tabulated according to interest group. This is followed by a general overview of the comments arising out of the question. At the end of this section of the report is a tabulation of all replies according to interest group and province.

QUESTION 1

The concept of building commissioning seems to vary from person to person depending on their point of view. Which of the following short definitions is closest to yours?

Replies

48	A special, one-time, checking out of the safety and service systems of a building when the building is completed.
38	An ongoing process of checking out the safety and service systems of a building as they are installed.
5	Both or Neither.

Distribution

Interest Group	1st Def'n	2nd Def'n	Both/ Neither
Owners, Developers & Contractors	7	8	0
Architects & Engineers	17	13	0
Industry & Manufacturing	0	3	0
Regulatory Authorities	24	14	5
TOTALS	48	38	5

Comments

A small majority of the comments to this question, 53%, might suggest that the "one-time" approach to building commissioning was the view most widely held. The comments made after a few moments of reflection by the respondents tended to tip the balance the other way. The size and complexity of modern buildings were cited as exceptions to the choice made.

On the other hand, many emphasized that commissioning should start at the concept stage, proceed through the design and construction phases, and be taken yet another step to include the training of operating and maintenance personnel of a building. Some even considered regular periodic checks, say every five years, to be part of the commissioning process.

QUESTION 1 (cont'd)

This "ongoing" approach found favour with 42% of the respondents while 4% indicated "both" or "neither". Another concept put forward placed commissioning between where the Building Code leaves off and the Fire Code takes over. Clearly there are differences of opinion on the definition of building commissioning.

QUESTION 2(a)

Does your organization require formal commissioning practices to be carried out at the present time in the construction of buildings?

Replies

50	Yes
33	No

Distribution

Interest Group	Yes	No
Owners, Developers & Contractors	11	3
Architects & Engineers	19	9
Industry & Manufacturing	0	0
Regulatory Authorities	20	21
TOTALS	50	33

OR

Do you have commissioning practices imposed on your organization at the present time?

Replies

24	Yes
28	No

QUESTION 2(a) (cont'd)

Distribution

Interest Group	Yes	No
Owners, Developers & Contractors	2	5
Architects & Engineers	11	10
Industry & Manufacturing	3	0
Regulatory Authorities	8	13
TOTALS	24	28

Comments

Although some 50% of respondents indicated that they required commissioning to be carried out on new buildings, their comments revealed that this practice was not generally all-encompassing. In the great majority of cases, only fire safety systems are involved. Major hospitals, however, are generally given the "full treatment".

The view is held by many that the enforcement of Building Code requirements leading up to the granting of an Occupancy Permit is akin to building commissioning. Letters from architects, engineers, contractors, etc., certifying that the work for which they are responsible has been completed and meets the requirements of the Code, are generally required.

QUESTION 2(b)

For what activities is commissioning required?

Replies

Activity	Yes	No	Comments
(1) Power Systems (normal & emergency)	74	8	90% yes
(2) Fire Safety Systems (fire alarm, detection systems, etc.)	82	5	94% yes
(3) Lighting Systems (interior, exterior & control)	45	29	61% yes
(4) HVAC (heating, cooling, alternate fuel)	55	18	75% yes
(5) Plumbing (hot & cold)	46	17	73% yes
(6) Communication and Signalling Systems (telephone, security, intercom)	56	20	74% yes
(7) Elevating Devices (elevators, escalators)	57	22	72% yes
(8) Interactive System	34	19	64% yes
(9) Other	0	0	

Comments

The replies to Question 2(b) indicated that "Fire Safety Systems" rank highest among the building systems required to be commissioned. Power systems, particularly with respect to emergency lighting, ranked second. Other systems were ranked considerably lower.

As to documents currently used for commissioning these systems, local building codes, fire codes and referenced standards were generally cited. Compliance certificates for sprinklers and fire alarms and similar verification documents signed by professionals are generally required.

QUESTION 3

Do you agree that there is a need for improved practice for commissioning of buildings?

Replies

86	Yes
0	No
2	Undecided (?)

Distribution

Interest Group	Yes	No	?
Owners, Developers & Contractors	12	0	1
Architects & Engineers	27	0	1
Industry & Manufacturing	3	0	0
Regulatory Authorities	44	0	0
TOTALS	86	0	2

Comments

It is significant that most of those who replied to this question agreed that there is a need for improvement in the practice of commissioning buildings. There were only a few who seemed undecided.

Of particular interest is the view of a number of regulatory authorities that building commissioning should not be required by regulation. Instead, they would prefer to see commissioning as something required by owners. They also see commissioning as an answer to a lot of their present problems.

Other respondents, who are adamant that commissioning should not become yet another regulation, are at the same time stymied by the fact that owners see only extra costs associated with commissioning. Convincing the owners, they say, is the answer.

QUESTION 4(a)

Do you feel there is a need to develop a series of Canadian national documents on which commissioning could be based?

Replies

77	Yes
8	No

Distribution

Interest Group	Yes	No
Owners, Developers & Contractors	9	4
Architects & Engineers	25	3
Industry & Manufacturing	3	0
Regulatory Authorities	40	1
TOTALS	77	8

Comments

The replies to Question 4 indicated that the great majority agrees on the need to develop a series of national documents which could serve to make commissioning practices more uniform in Canada. It was suggested that these should take the form of guidelines intended for voluntary use, principally by owners and developers. They should also be kept simple and affordable.

Fear was expressed by some that such documents would find their way into building bylaws and add another legislative process to an already over-regulated industry. Unfortunately, most respondents saying "no" to both questions gave no reasons.

QUESTION 4(a) (cont'd)

If "yes", would you support the development of these documents by CSA?

Replies

74	Yes
5	No

Distribution

Interest Group	Yes	No
Owners, Developers & Contractors	9	2
Architects & Engineers	25	1
Industry & Manufacturing	2	1
Regulatory Authorities	38	1
TOTALS	74	5

QUESTION 4(b)

Please give your opinion on the priority of document development by circling the appropriate number.

Replies

Priority:	Low		Medium		High	Ave.
Building Systems	1	2	3	4	5	
(1) Power System	2	2	6	13	15	4.0
(2) Fire Safety System	0	0	0	2	40	5.0
(3) Lighting System	2	4	15	9	7	3.4
(4) HVAC	3	5	7	12	12	3.6
(5) Plumbing	3	8	10	10	6	3.2
(6) Communication and Signal Systems	3	1	8	9	21	4.0
(7) Elevating Devices	3	1	8	10	16	3.9

Comments

When asked to give an opinion on the priority of document development, fire safety rated highest with communication, power and elevator systems running a close second. Lighting, plumbing and HVAC were grouped together in third place.

In the "other suggestion" category, the following subjects were mentioned: Emergency lighting, standpipe and sprinklers, firefighter elevators, emergency power, smoke evacuation, water supply for fire departments, architectural, civil, building envelope performance and life safety.

QUESTION 5

If activity is initiated to develop commissioning documents, would you or someone from your organization be interested and willing to participate in the committee activities?

Replies

70	Yes
30	No

Would you have any existing documents that you would recommend and make available to a committee(s) as resource material?

Replies

38	Yes
46	No

Distribution

Interest Group	Yes	No
Owners, Developers & Contractors	4	12
Architects & Engineers	14	17
Industry & Manufacturing	2	1
Regulatory Authorities	18	26
TOTALS	38	46

Comments

There was no lack of respondents indicating an interest and willingness to participate in committee activities. This list of individuals will be very helpful in finding suitable committee members should this project go forward.

Good support was also shown by the large number of respondents willing to make their documents available or suggesting those from outside sources.

Some respondents also included documents with their reply and extended a special word of thanks.

QUESTION 6

Would you be interested in attending a regional workshop to discuss commissioning in greater depth?

Replies

68	Yes
13	No

Distribution

Interest Group	Yes	No
Owners, Developers & Contractors	19	3
Architects & Engineers	24	6
Industry & Manufacturing	3	0
Regulatory Authorities	22	4
TOTALS	68	13

Comments

If regional workshops are held, replies would indicate that they will be well attended.

QUESTION 7

Would you consider becoming a financial partner to support the development of the documents?

Replies

7	Yes
3	Maybe
32	No

Distribution

Interest Group	Yes	No	Maybe
Owners, Developers & Contractors	2	0	2
Architects & Engineers	0	11	1
Industry & Manufacturing	2	1	0
Regulatory Authorities	3	32	0
TOTALS	7	44	3

Comments

As would be expected in soliciting financial support in these difficult times, most respondents indicated that they were not in a position to support this project financially. It was, however, reassuring to have an indication that some financial help could be expected.

QUESTION 8

Could you suggest others who may be interested in responding to this questionnaire?

Distribution

Interest Group	No. of Names
Owners, Developers & Contractors	11
Architects & Engineers	66
Industry & Manufacturing	8
Regulatory Authorities	41
TOTALS	126

Comments

Some 126 names of individuals and organizations were suggested as having a possible interest in responding to the questionnaire. Many of these had received the questionnaire in the original mailing. Our policy of not soliciting organizations at this time eliminated all but those where an individual's name had been given. Even with these reductions, another 66 questionnaires sent out, bringing the total distribution to 201.

QUESTION 9

Other general comments?

Response

Interest Group	No. of Names
Owners, Developers & Contractors	5
Architects & Engineers	10
Industry & Manufacturing	1
Regulatory Authorities	6
TOTALS	22

Comments from owners, developers and contractors indicated that although they consider proper commissioning essential, they do not believe it should be made mandatory through legislation. For commissioning to work, they say the industry must accept it as an alternate to the present regulatory system, not in addition to it. With these reservations, CSA was complimented on its endeavour and wished "good luck!".

Architects and engineers raised similar reservations regarding the possibility of commissioning becoming a legislative requirement. The opinion was expressed that better buildings can only be achieved by industry-driven acceptable practices and workmanship, not by legislation enforced by authorities. Again, however, commissioning was cited as a necessary process, ensuring that buildings are turned over to owners in working order.

Regulatory authorities were particularly generous with their expressions of good luck and best wishes. The opinion was also expressed that commissioning is, in effect, the "proof-of-the-pudding" in the building process.

**RESPONSE TO THE CANADIAN STANDARDS ASSOCIATION
QUESTIONNAIRE ON BUILDING COMMISSIONING**

	Owners, Developers and Contractors		Architects and Engineers		Industry and Manufacturing		Regulatory Authorities		Totals		% Response
	Sent	Returned	Sent	Returned	Sent	Returned	Sent	Returned	Sent	Returned	
British Columbia	9	3	18	8	4	2	10	7	41	20	49
Alberta	3	2	7	2	1	0	5	3	15	7	47
Saskatchewan	9	3	6	5	1	1	6	4	22	13	59
Manitoba	2	1	5	3	0	0	4	3	11	7	64
Ontario	6	5	16	5	4	4	23	17	49	31	63
Québec	5	0	3	1	0	0	6	1	14	2	14
New Brunswick	1	0	4	2	1	0	6	2	12	4	33
Nova Scotia	3	0	8	5	0	0	3	0	14	5	36
Prince Edward Island	0	0	0	0	0	0	4	1	4	1	25
Newfoundland	4	3	3	1	0	0	3	1	10	5	50
Yukon	0	0	0	0	0	0	3	2	3	2	67
Northwest Territories	0	0	0	0	0	0	2	1	2	1	50
Federal Government	2	0	0	0	0	0	2	2	4	2	50
Totals	44	17	69	32	11	7	77	44	201	100	50
% Response	39		46		64		57		50		

Conclusions

The following conclusions can be drawn from the results of the questionnaire:

- There appears to be a need for improvement in the practice of the commissioning of buildings. This view is widespread across Canada and is not regional.
- There appears to be a number of different understandings of the process of building commissioning. This ranges from the one time checking of a building when it is finished to the more progressive approach of having the commissioning process start at the concept stage and proceed through the design and construction phases. There is therefore a need to educate and develop a commonly accepted approach.
- The survey gave an indication that there is a growing opinion that building commissioning should be considered synonymous with or a step towards total quality assurance for buildings. It was further indicated that better buildings can only be achieved in the long run by industry and profession driven practices rather than by legislation.
- The current level and application of commissioning is clearly not consistent across Canada. It was clear from the survey however that five safety systems were the most active area for commissioning to be carried out.
- There appears to be a need for a series of Canadian National documents on which commissioning can be based. While there is a multitude of various documents available from different sources across the country they are not uniform in their preparation or implementation.
- There was excellent support expressed through the survey that the development of commissioning documents be carried out under the auspices of CSA.
- There was excellent support indicated from volunteers to participate on any committees established to develop commissioning documents.