



भारतीय मानक ब्यूरो BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002
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कार्यवृत्त

हमारा संदर्भ: सीईडी 46:P2/ए-2.9

09 फरवरी 2024

विषय: अग्नि एवं जीवन सुरक्षा के लिए पैनेल, सीईडी 46:P2 की नोवी बैठक के कार्यवृत्त

सीईडी 46:P2 के सभी सदस्य

प्रिय महोदया/महोदय,

हमें, अग्नि सुरक्षा पैनेल, सीईडी 46:P2 की नोवी बैठक जो 19 जनवरी 2024 को नई दिल्ली में सम्पन्न हुई, के कार्यवृत्त भेजते हुए प्रसन्नता हो रही है। कार्यवृत्त की पुष्टि अध्यक्ष, श्री एस० के० ढेरी द्वारा की जा चुकी है।

आपसे अनुरोध है कि कार्यवृत्त का अवलोकन करें और इसकी यथार्थता पर अगर कोई सम्मतियाँ हों तो अधोहस्ताक्षरकर्ता को भेज दें। यदि दो सप्ताह पश्चात् तक कोई सम्मति प्राप्त नहीं होती तो आपकी सुविधा के लिए यह समझा जाएगा कि आपने कार्यवृत्त का अनुमोदन कर दिया है।

जिन सदस्यों को उपरोक्त बैठक में कुछ कार्य सौंपे गये हैं उनसे अनुरोध है कि समिति के निर्णय के अनुसार वे उन्हें शीघ्र पूरा करके भेजें ताकि आगे की उचित कार्रवाही की जा सके।

सधन्यवाद,

भवदीय,

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(अरुणकुमार एस)

वैज्ञानिक ई/निदेशक एवं प्रमुख (सिविल इंजीनियरी)

ई-मेल: ced46@bis.gov.in

जैसा कि आपको विदित है कि आपको सभी प्रलेख/पत्राचार ईमेल द्वारा भेजे जा रहे हैं। यह आवश्यक है कि हमारे पास आपका सही ईमेल ID हो ताकि उपरोक्त आपके पास पहुंच सके। इसलिये जब भी आपके ईमेल ID में कोई परिवर्तन हो ता हमें सूचित करें।



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MINUTES

Our Ref: CED 46:P2/A-2.9

09 February 2024

**Subject: Minutes of the Ninth Meeting of the Panel for
Fire & Life Safety, CED 46:P2**

ALL MEMBERS OF CED 46:P2

Dear Madam/Sir,

Please find enclosed a copy of the Minutes of the Ninth Meeting of the Panel for Fire and Life Safety, CED 46:P2, held on 19 January 2024 in New Delhi. The Minutes have been approved by the Convener, Shri S. K. Dheri.

Comments, if any, confined to the accuracy of recording may please be sent to the undersigned at the earliest, preferably within two weeks' time. If no reply is received within the above period, we may be permitted to presume your approval of the Minutes as recorded.

The members who have been entrusted with some responsibility as recorded in the above minutes are requested to provide their inputs at the earliest as per the decision of the Panel so that further necessary action can be taken on priority.

Thanking you and with regards,

Yours faithfully,
Sd/-

(Arunkumar S)
Sc 'E'/Director and Head (Civil Engg)
e-mail: ced46@bis.gov.in

As you are aware, a number of important documents/communications are sent to the members of BIS Technical Committees through e-mail. In order to ensure that these reach you, it is necessary that we have your latest e-mail ID. You may, therefore, keep us informed whenever there is any change in your e-mail ID. Further, in case you have still not sent your e-mail ID details to us, you are requested to send the same immediately.

BUREAU OF INDIAN STANDARDS

MINUTES

Panel for Fire & Life Safety, CED 46:P2 : **Ninth Meeting**
Thursday, 19 January 2023 : **1030 h – 1500 h**

Lal C Verman Hall, Manak Bhavan, Bureau of Indian Standards, 9 Bahadur Shah Zafar Marg, New Delhi 110 002

Convener: Shri S. K. Dheri

Member Secretaries: Shri Arunkumar S
Smt Madhurima Madhav

Members Physically Present:

1)	Shri Mahesh Dadaji Warbhe	Airports Authority of India, New Delhi
2)	Shri Shammem Ahammad C	Airports Authority of India, New Delhi
3)	Smt Rashmi Bhardwaj	Delhi Metro Rail Corporation Limited, New Delhi
4)	Shri K. R. Hatyal	Directorate of Maharashtra Fire Services, Mumbai
5)	Shri Srinivas Valluri	Fire and Security Association of India, Chennai
6)	Shri M. V. Deshmukh	Fire Safe India Foundation, Mumbai
7)	Shri Srikanth Yajjala	FM Engineering International (India) Private Limited, Bengaluru
8)	Shri S. K. Duggal	Indian Plumbing Association, New Delhi
9)	Shri M. K. Gupta	Rep. Indian Plumbing Association, New Delhi
10)	Shri R. C. Sharma	In Personal Capacity, New Delhi
11)	Shri T. R. A. Krishnan	In Personal Capacity, Coimbatore
12)	Shri V. Suresh	In Personal Capacity, Thiruvananthapuram
13)	Shri P. R. Lonkar	Ministry of Home Affairs, New Delhi
14)	Shri Amit Prakash	Rep. National Council for Cement and Building Materials, Ballabgarh
15)	Shri Sandeep Goel	Proion Consultants, New Delhi
16)	Shri C. Lakshmi Prasad	State Disaster Response and Fire Services Department, Government of Telangana, Hyderabad

Members Virtually Present:

17)	Shri Amit Goel	Rep. AECOM India Private Limited, Gurugram
18)	Dr Shorab Jain	CSIR - Central Building Research Institute, Roorkee
19)	Shri Mukesh Verma	Delhi Fire Service, Govt. of NCT of Delhi, New Delhi
20)	Shri Ashok Tewari	Delhi Metro Rail Corporation Limited, New Delhi
21)	Shri Deepak Gupta	Rep. Delhi Metro Rail Corporation Limited, New Delhi
22)	Ms Nabila Mariyam	Rep. Delhi Metro Rail Corporation Limited, New Delhi
23)	Shri Santosh S. Warick	Directorate of Maharashtra Fire Services, Mumbai
24)	Shri Nitin Raiker	Directorate of Fire & Emergency Services, Govt of Goa, Goa
25)	Shri Gulshan Khurana	Fyrprotek (Fire Engineers and Consultants), New Delhi
26)	Shri Namashivayam	Rep. Forum of Critical Utility Services, Bengaluru
27)	Shri G. N. Gohul Deepak	Glazing Society of India, Chennai
28)	Shri M. S. Patyal	Institute of Fire Engineers India, New Delhi
29)	Shri Amor Kool	Kaleidoscope, New Delhi
30)	Shri Sanjeev Angra	Lloyd Insulations India Limited, New Delhi
31)	Shri Umesh Gopalrao Palande	Municipal Corporation of Greater Mumbai, Mumbai
32)	Shri H. R. Ranganath	Maple Engineering Design Services (India) Private Limited, Bengaluru
33)	Shri Brijesh Singh	National Council for Cement and Building Materials, Faridabad
34)	Shri Ramesh Kumar	National Fire Service College, Nagpur
35)	Shri R. M. Kshirsagar	Rep. National Fire Service College, Nagpur
36)	Dr Gouthamkumar	Rep. National Fire Service College, Nagpur
37)	Shri Lalit R. Gabhane	National Safety Council, Navi Mumbai
38)	Shri K. D. Patil	National Safety Council, Navi Mumbai
39)	Shri G. V. Narayana Rao	State Disaster Response and Fire Services Department, Government of Telangana, Hyderabad
40)	Shri Manos De	Tata Consulting Engineers Limited, Navi Mumbai
41)	Ms Swati Nachane	The Indian Institute of Architects, New Delhi
42)	Shri Animesh Singh	Uttar Pradesh Fire Service, Government of Uttar Pradesh, Lucknow
43)	Shri Rahul Pal	Uttar Pradesh Fire Service, Government of Uttar Pradesh, Lucknow
44)	Shri V. Manjunath	UL India Private Limited, Bengaluru

BIS Directorate General:

Shri Rajesh Choudhary, Sc 'B' Civil Engineering)

Shri Abhishek Sharma Scientist 'B'/Assistant Director (Civil Engineering)

Item 0 OPENING REMARKS

0.1 The Convener, Shri S. K. Dheri extended a warm welcome to all the members present for this important meeting of the Panel on Fire and Life Safety, CED 46:P2 which has been tasked with the revision of Part 4 'Fire and Life Safety' which is implemented in most of the States/UTs in the country through respective Acts, Rules/Regulations. He specially welcomed Shri V. Suresh, Chairman of the National Building Code Sectional Committee as well as member of this Panel.

0.2 Shri Dheri mentioned that this part of the Code gains importance in the current scenario where incidences of fire both in the old buildings and in the modern buildings are noted; including those buildings in which the use occupancies were converted without proper examination of the revised requirements for fire safety. He cited the examples of instances in which reporting of fire incidences attributing the cause to electricity/its short circuiting, which is very difficult to prove so. In this context, he mentioned that apart from the existing provisions in Clause **3.4.6.2** of this Part and those in Part 8/Section 2, the Panel may do the needful to review the Electrical Safety aspects which if overlooked can lead to fire/related incidences.

0.3 Referring to the increased use of air handling units and use of ducts in air movement, he mentioned that more robustness needs to be included in this revision, addressing the aspects of movement of smoke and smoke management.

0.4 Thereafter, it was decided to take up the Agenda item-wise.

Item 1 CONFIRMATION OF MINUTES OF THE LAST MEETING

1.1 There being no comments, on the Minutes of the eighth meeting of the Panel held on 01 and 02 August 2019 in New Delhi, circulated vide BIS DG letter No. CED 46:P2/A-2.8 dated 12 October 2020, the Panel confirmed the same, as circulated.

Item 2 COMPOSITION

2.1 The Panel noted its present composition as last reviewed by the National Building Code Sectional Committee, CED 46 of BIS in its meeting held in May 2023 as given in Annex 1 to the Agenda.

The Panel then noted/decided as follows:

- a) To withdraw the nomination of M/s AECOM India Pvt Ltd, in view of their lack of interest and lack of revised nominations despite multiple reminders.
- b) The Panel agreed to the request of relinquishment of M/s Oil Industry Safety Directorate, New Delhi as per their written communication.
- c) The Panel endorsed the revised nominations indicating the names of representatives of the following as informed to BIS:

Organization	Revised names received
Forum of Critical Utility Services, Bengaluru	Shri Liaquat Ali Khan Shri Namashivayam (Alt) Shri Amit Goel (YP)
FYRPROTEK (Fire Engineers & Consultants), Delhi	Shri Gulshan Khurana Ms Namita Nanda (Alt)
Directorate of Maharashtra Fire & Emergency Services, Mumbai	Director and Fire Advisor Shri Kiran Hatyal (Alternate)

- d) The following organizations were requested to communicate to BIS about their revised nominations/alternate nominee on the Panel:
- 1) Directorate of Fire & Emergency Services, Govt of Goa, Goa
 - 2) Central Industrial Security Force, New Delhi
 - 3) Fire & Security Association of India, Chennai
 - 4) Glazing Society of India, New Delhi
 - 5) Insurance Regulatory and Development Authority, Hyderabad
 - 6) Military Engineer Services, E-in-C's Branch, Army HQ, New Delhi
 - 7) Tata Consulting Engineers Ltd, Navi Mumbai
 - 8) Tamil Nadu Fire Service Department, Chennai
 - 9) West Bengal Fire & Emergency Services, Kolkata
- e) To co-opt Dr K. C. Wadhwa in his personal capacity considering his rich experience in the subject (including at DRDO) and also the Chairperson of CED 22 of BIS.

2.1.1 The Panel considered the requests for co-option and decided as given under the item of the Agenda and decided as follows:

- a) To enable to co-opt M/s Hindustan Construction Company Ltd, Mumbai on the Panel, specific inputs/suggestions from them including their contribution to the chapter be solicited.
- b) To enable to co-opt M/s DLF, Gurugram on the Panel, specific inputs/suggestions from them including their contribution to the chapter be solicited.

Item 3 PROJECT OF REVISION OF NBC

3.1 The Panel noted the information regarding comprehensive exercise of revision of NBC 2016, being executed by the 22 Panels to bring updates to the various Parts/Sections of NBC 2016, so as to bring out a most modern and state-of-the-art revision of the Code.

3.2 The Panel noted the existing chapter on Fire and Life Safety, that is, Part 4 of NBC 2016 and its contents as given in Annex 3 to the Agenda.

3.3 Updates from the Previous Meeting

3.3.1 Amendment to NBC 2016

The Panel noted the information about the two meetings of the Task Group (TG) constituted in the last meeting to review the provisions relating to metro station and metro trainways of Part 4 of NBC 2016. The Panel once again lauded the efforts of the Group that recommended the necessary updates to the respective provisions which was accordingly issued as Amendment No. 1 to NBC 2016 in March 2021.

3.3.2 Andhra Pradesh Gazette Notifications

The Panel noted the information under the item of the Agenda that relates to the two Gazette Notifications issued by the State of Andhra Pradesh as per which rather than the comprehensive provisions of Part 4 of the Code the use of other fire safety equipment such as plunger pumps, fire engine pumps, etc under the **Decentralized Fire Safety Systems (Part 1)** and **Alternatives to water sprinklers in the design of fire safety systems (Part 2)** were referred for use; for the G.O.s [CLICK HERE](#). The Panel noted the detailed inputs in the Minutes of the meeting of the members of this Panel (as in the Group) that met in April 2022 and July 2023 respectively which gave its recommendations particularly not to dilute the provisions in Part 4 of NBC 2016.

Members present in the meeting also mentioned that no Authority including the Governments should dilute the provisions arrived at based on consensus w.r.t fire safety as enshrined in NBC 2016. Representatives of Telangana Fire Safety and of FSAI clarified during the meeting that the above 2 highlighted notifications/systems were amended recently by the Govt. of A.P.; and that revised circulars were issued.

3.3.3 The Panel noted the instances of differences that exists with that of the provisions in Part 4 of NBC 2016 from those followed in the States/UTs w.r.t to Fire Safety in India such as on height of high rise buildings, permitted height for hospitals (62 m in Gurugram; 100 m in Telangana), malls above 15m height in Kerala, etc. The Panel noted that any such deviation from those given in NBC 2016 are not warranted and are solely at the risk of the relevant state and fire authorities. Shri Suresh highlighted that the NBC has been in existence for over 6 decades and the intent of the users should be to directly adopt or adapt the provisions of the Code considering the voluminous amount of inputs which were the basis for the current version. It was suggested by the members that in this revision, provisions relating to necessary cautions be further enhanced in the foreword warning the users to not dilute the requirements which would otherwise enhance the vulnerability to fire risk. The Panel decided to address the aspects of fire safety including smoke management in the 9 groups of building classification including the temporary buildings, both in the NBC as well as the relevant standards on fire-fighting under CED 22 and on fire safety under CED 36 of BIS.

3.4 The Panel noted the information about the list of questions indicated as FAQ on Part 4 of NBC as given in Annex 5 of the Agenda. Considering the full-fledged revision of the Part 4 now being taken up, and based on the discussions during the meeting, the following was decided:

- a) An **Expert Working Group** with the following composition would pen down the answers to the various questions (**of the FAQ**) within a months' time; and BIS to help in moderating the questions:

1) Shri Sandeep Goel

- 2) Shri Srinivas Valluri
- 3) Shri Kiran Hatyal
- 4) Shri Mukesh Verma
- 5) Shri R. C. Sharma

- b) Shri Prashant Lonkar and Shri T.R.A. Krishnan, kindly agreed to peruse the response and suggest their inputs before finalizing the responses formally.
- c) The finalized responses to the above FAQs to be suitably hosted in the website, as done for the 'Simplified Guidelines for Earthquake Safety' as per NBC 2016.
- d) Based on the FAQs, the other recommendations to be received from the above group shall be shared with the respective expert groups involved in the revision of the Code as indicated in these Minutes.

Item 4 COMMENTS RECEIVED ON PART 4 'FIRE & LIFE SAFETY' OF SP7 : 2016

4.1 The Panel noted the comments received from various (22) interests as indicated under the item of Agenda and the supplementary Agenda. The Panel was also apprised of the very recent communication from M/s APCO Worldwide, New Delhi suggested by them in the usual format for commenting on the BIS' standards. The Panel also noted the inputs received from Shri T. R. A. Krishnan on Clause 5, Table 7 and Clause E-6, in line with the decisions in the previous meeting, as given at Annex 24 to the Agenda.

4.2 The Panel discussed about the comments particularly of those who were present during the meeting and noted/decided as follows:

- a) Regarding the updated version of Table 7, it was noted that for certain occupancies, the rate of replenishment may have to be calculated based on the number of water jets in operation, quantity of water discharged per unit time during emergency/distress to arrive at the capacity of water tank. In the case of oil storage yards, it was noted that water quantity is to be arrived based on the fixed amount of fire-fighting period of 4 hours. As regards, whether the entire built up area of every occupancy is to be protected or otherwise, it was noted that the specific requirements are covered in IS 13039 which is taken for revision, and is addressing the same. As regards, the other occupancies Shri T. R. A. Krishnan mentioned that the same can be suitably addressed in the respective standards and the NBC may suitably cross refer. Shri Krishnan also suggested that parity in the Table 7 of Part 4 and that in the ongoing revision of IS 13039 may have to be maintained to enable guide the users; and he urged that the NBC alone retain the Table 7 and other standards cross refer to Part 4.

- b) Fire Advisor to Govt. of India mentioned regarding the 2 meetings in Ministry of Home Affairs that included the matter relating to fire safety of small industries, who claim that between 6 and 10 % of the investment for a new such industry is spent on providing the amenities for fire-fighting and fire safety. Fire Advisor also mentioned that the Home Minister in a meeting with the various State authorities informed about the need to bring down the cost as above; and for the same, a committee was constituted under the leadership of DG, Fire Services having a representative of some of the fire authorities including the BIS. So far, 2 meetings of the Group have been held and pertaining to BIS it was suggested to review the provisions in the relevant standards and NBC to address the cost component as above without compromising the fire safety. The Panel observed that standards are always with a view to ensuring the necessary safety and the matter of cost of equipment will come under the purview of technology/solution providers. In this context, BIS informed that the Micro Sector manufacturing units who have been provided with the permission to use ISI mark on their products by BIS were exempted to the tune of 80 % in the payment of annual marking fees.
- c) DMRC representatives referred to the provisions in clause **3.4.6.2** and **J-8** on emergency power for fire and life safety systems and sought that the requirement of Diesel Generator Set be waived off for the metro station buildings considering that such buildings are fed by power from two independent sources. The Panel deliberated in the matter and observed that considering the various metro station buildings across the country relying on electricity power from two different sources. It was agreed that the urban metro station buildings could be exempted from the requirement of the additional power source namely the Diesel Generator provided that there is always source of power from two independent but dependable power sources which the metro authorities shall ensure in each of the respective metro station buildings.
- d) As regards the discussions on the Amendment No. 1 issued to Part 4 based on the inputs from the team of metro rail officials referred by the MoHUA's metro co-ordination desk, the Panel deliberated regarding the suggestion of DMRC regarding a separate standard (as in **NFPA 130 : 2023** 'Standard for Fixed Guideway Transit and Passenger Rail Systems') for the metro train system, the Panel noted the earlier recommendations of the task group which in its 2 meetings had recommended formulation of a separate standard exclusive for fire safety provisions of metro stations and train ways which to cover the mono rail, BRTS and the related urban transit systems. The Panel noted that the Fire Safety Sectional Committee, CED 36 was then requested to constitute a separate Group to address this topic. The Panel decided that while the CED 36 will prepare on priority a separate comprehensive standard for various transport systems including metro rail, light rail, RRTS, BRTS, etc, the necessary aspects alone should be covered in this revision of Part 4.
- e) To the specific query regarding classifying the occupants in the metro stations under a new/special occupancy category, the Panel observed that the Code already categorizes D-7 as the special occupancy that covers the transit occupancy. DMRC representatives mentioned that these days apart from the public using the platform and the concourse, there are small-sized and permanently fixed other occupancies like eateries, ATMs, novelty stores, etc which are essential both for the public as well as to ensure commercial

viability. It was also noted that certain metro stations are housed along with bigger-sized shopping malls, mercantile establishments, business occupancies, food courts, even multiplexes, etc in other stories of the same building where the metro trains are transiting and people are boarding & de-boarding at different storeys. It was decided that the matter be considered in detail by the above Group in CED 36. The Panel observed that at any given point of time, the concourse and importantly the platform are housing much more than 50 people even when the people are in motion/movement thus both these classify under assembly occupancy.

- f) The Convener suggested that in this revision it will be essential to revisit the occupancy classifications to cover not only the above aspect indicated in the metro station buildings but also those in factories, warehouses, multilevel car parking's, to name a few. Shri Suresh, mentioned that this topic is quiet sensitive and therefore the best practices followed by other nations including the international fire codes should be explored while making any modification.
- g) On the query raised by a member regarding arriving at the occupant load (area per person) Shri Sandeep Goel, mentioned that the density in our NBC Part 4 is arrived based on the gross floor area; and he cited examples of countries that follow our system and those which follow the net area basis method. He suggested exercising caution in modifying the occupant load unless we are provided with necessary data on the same.
- h) On the discussions regarding fire exits (staircases), Shri Goel suggested that clarity needs to be brought in the Code regarding the distances between two such exits, the common wall between two staircases, cross ventilation aspects in the naturally ventilated staircase which is devoid of smoke/products of combustion making them more sought after then the fully enclosed staircases which require not only pressurization but also use of fire doors.
- i) As regards the recent incident of fire/smoke in the single staircase provided in four storeyed residential occupancy, it was decided to suitably clarify in the FAQ regarding location of the meters/meter rooms and the provision of slotted doors/grills in the *mumty/terrace room* to avoid built up of smoke and provide natural stack effect that can keep the staircase devoid of smoke.
- j) Regarding the fire safety aspects in the car park areas/floors/facilities it was decided to include the necessary caution w.r.t fires that are possible in the electric vehicles which have to be comprehensively addressed in Part 3, Part 8/Section 2 and this Part 4 of the Code. The Panel also noted the importance of addressing the aspects relating to EV charging systems in the parking lots particularly in the case of existing buildings where not only new electric cabling systems but also the necessary separation and location/ventilation of EV charging infrastructure should be covered. Members also shared their feedback regarding the documents available at State levels and in certain authorities including that of MoHUA which indicate mandatory requirement of vehicle charging provisions for up to 20% of the vehicles. In this context it was noted that certain authorities have mandated the parking of CNG vehicles outside of the building line, and some require no such charging facility on the ground floor of the buildings. In addition, the FAQ section may suitably attempt the examples/dangers of bad practices in EV charging facilities. Further, suitable requirements for obtaining the NOC of such facilities/buildings should also be addressed.

- k) The Panel deliberated in detail regarding the provision of refuge area at specific floor levels (around every 15 m in height) and opined about the need for refuge locations at every floor level to address the needs of such/special people. In this context, the Panel appreciated the suggestion made by Shri Sandeep Goel regarding the concept of 'L' shaped fire towers in special buildings and tall buildings that may be addressed in this revision of the Code.
- l) As regards the suggestion/remarks made earlier during the meeting by the Convener regarding smoke management, the Panel decided to constitute an **Expert Working Group** comprising the following to address **Smoke Management** aspects:
- 1) **Shri S.S. Warick**
 - 2) Shri Srinivas Valluri
 - 3) Representative of ISHRAE
- m) To constitute an **Expert Working Group** comprising the following to address **Electrical Safety** concerns:
- 1) **Shri Srinivas Valluri**
 - 2) Shri T.R.A Krishnan
 - 3) Representative of NFE
- n) It was also suggested that Clause **3.4.10.2** on the glass façade be suitably reworded to inform both the planners/designers and the authorities to guide them to use the fire-fighting shaft for egress/entry. The Panel clarified that it is not intended for the fire personnel to enter the floors through the fire access panels. Regarding the suggestion in the Annex from M/s SE Controls India on automated smoke vents, it was decided that the separate expert group on smoke management would deal with the proposal comprehensively.
- o) FSAI representative also opined on the need to clarify regarding occupant load in the case of toilets, staircases and the like which will be used by users of the building only. Regarding the clubhouses which are incidental occupancies to the primary occupancy of the building, necessary clarity regarding the number of users/people may be made suitably in the Code in the FAQs.
- p) FSAI representative, Shri Valluri also suggested the need to unify the provisions given in NEC 2023, recently revised CEA Regulations 2023 and the revision of NBC 2016, its Part 8/Section 2 and this Part 4 so that there is no room for ambiguity at the level of building planners, designers and the approving authority. The location of transformers, pump rooms, etc were suggested by him as some of the prominent points.
- q) Regarding the Lithium Ion batteries used in electric vehicles, server rooms and data centres and the associated fire safety in the occupancies, it was noted that the CEA Regulations indicate just the use of smoke detectors; while auto manufacturers employ fire sprinklers systems having the specific set of sprinklers and their K-factor values. It was also noted that fires in lithium batteries are almost impossible to put off considering the repeated re-ignition including those in the case of battery packs even if submerged fully in water. The Panel also acknowledged the fact that thick smoke emanates from such lithium battery fires and the management of smoke in such

situations is quite daunting. The Panel was apprised that the Annex G of NFPA 855, 'Standard for the Installation of Stationary Energy Storage Systems (2023)' provides a guide for suppression and safety of lithium-ion battery ESS. The same along with the Indian Standards formulated by the Electrical Energy Storage Systems Sectional Committee, ETD 52 was decided to be perused in the matter towards addressing the fire safety aspects.

- r) Representative of M/s Maple Engineering Design Services (India) Pvt Ltd., Bengaluru briefed regarding the clarity to be introduced in the Code regarding the use of water curtains including their activation to enable contain the fire/smoke in specific situations; booster pump at terrace level to maintain minimum working pressure of 3.5 bars at the remotest sprinkler. Regarding the suggestion on the use of CPVC pipes and fittings, the Panel briefly deliberated regarding permitting the use of such pipes in the automatic sprinkler-based fire extinguishing systems in the case of residential buildings vis-à-vis business (E-1 office buildings). It was also decided to have the inputs of CED 22:4 in the matter which apart from amending IS 15105 is also involved in the revision of IS 13039 covering therein the internal hydrants, external hydrants, water supplies (IS 9668) and sizing of pipes for the hydrants (IS 3844).
- s) Representative of the Glazing Society of India agreed to provide inputs from their members relating to fire safety aspects of glass and glazing in 3 weeks' time.
- t) Regarding the suggestion to prepare an explanatory handbook to Part 4 of NBC 2016, the Panel observed that the solution to FAQs which will be uploaded will be periodically updated to keep the same relevant to the practices.
- u) Regarding the suggestion and the revised inputs on Clause 5.1.3 regarding automatic sprinkler system, it was decided that there shall be no ambiguity in the provisions of Part 4 vis-à-vis IS 15105 (which has been decided to be amended).
- v) Noting the Part 8/Section 5A of the Code already permits the use of lifts in the case of evacuation of persons in the special category of super-tall buildings, the Panel observed that in the revision clarity on the use of fireman's lift/the lift in firefighting shaft to be used by building uses to be addressed.
- w) All the members were requested to send their inputs including special challenges/errors noticed in some of the prominent buildings constructed in the reason times so as to ensure that all the future code-compliant buildings do not lose their resiliency.
- x) W.r.t. the practices in the country in the case of multi-storeyed buildings where fire NOC is granted at two stages: one at the time of bare frame and slab, and the next after partitioning/post-occupancy by the tenant/owner who completes the fit-outs as per his choice, the Panel decided to consider aspects on this in the revision of the Code.
- y) Some authorities within the country have started to employ video-based surveillance towards fire safety audits (in the case of periodic renewal of NOC) which are being done every year for certain categories of buildings in certain states and at a maximum interval of 5 years. W.r.t. this aspect the Panel decided to consider in the revision of the Code.

- z) CED 36 was recommended to prepare the first version of the fire safety audit-related standard ASAP so as to enable cross refer the same in Part 4 of NBC. The same should also explicitly indicate the qualification, and competence of both the auditor and the personnel who would perform the audit.
- aa) Fire Advisor to Gol suggested to explicitly indicate that electrical audit of buildings is a prerequisite for fire audit/NOC issue, which the Panel agreed to suitably highlight, the same having been already covered in **14.4.2** of Part 2 of NBC 2016.
- bb) CBRI representative, Dr Shorab Jain raised about the incidences of under sizing the transformers including suggesting a 200 kVA as the minimum in the case of hospital buildings. FSAI representative clarified that the Part 8/Section 2 and the NEC 2023 are addressing this aspect. Shri Valluri mentioned the need for unification of the provisions given in NBC, NEC and the CEA.
- cc) Towards the specific suggestion of M/s ALP, CBRI representative proposed to use non-polymer based material as the insulation to ducting systems in hospital buildings considering the enhanced requirements of air quality in such building and the operation theatres.

Having considered all the above, including the comments listed in the Agenda and the Supplementary Agenda, the Panel decided to reconstitute the **Expert Working Group** as below to address in the revision of this Part 4, as below and give its recommendations:

- **Shri M.V. Deshmukh**
- Shri S.K. Dheri
- Shri R. C. Sharma
- Shri Santosh Warick
- Shri Srinivas Valluri
- Director, Delhi Fire Services
- Shri Tarak Chakraborty
- Shri T.R.A. Krishnan
- Shri Shashikant Jadhav
- Maple consultants, Bengaluru
- Shri Sandeep Goel

The above Group was authorized to consider also the inputs from the three other Groups constituted earlier relating to: FAQ, Smoke Management and Electrical Safety. This Group was suggested to consider the current version of the Chapter and address the matters/comments/suggestions/inputs as indicated in the Agenda; and those inputs to be received based on the meeting. The Group was requested to provide their inputs in the form of next version of the Chapter by April 2024 so as to enable hold the next meeting of the Panel in May 2024.

Item 5 ANY OTHER BUSINESS

5.1 Members thanked the Convener, Shri S. K. Dheri for ably conducting the meeting and providing leadership in the launching this revision of this important chapter on Fire and Life Safety which is widely implemented in the country.

5.2 BIS Secretariat also thanked the Convener and all the members for taking active interest during the meeting resulting in useful deliberations.
