1. Roll Call and Introductions

2. Discussion and voting on Section 909 of IFC/DBC-IFC
   a. (P120) F110): IFC 909.13.7
   b. (P113) (F103): IFC 909.15.1.3
   c. (P116) (F106): IFC 90915.1.3
   d. F21: DBC-IFC 909.15.1.3
   e. F22: DBC-IFC 909.15.2.3
   f. (P130) (F111): 909.15.3.3.5
   g. F23: DBC-IFC 909.15.3.3
   h. F24: DBC-IFC 909.15.3.4
   i. (P97) (F88): DBC-IFC 909.15.3-.5
   j. (P131) (F112): DBC-IFC 909.15
   k. F17: DBC-IFC 909.10.1, Item 8
   l. (P170): DBC-IFC 909.10.2

3. Discussion and voting on Appendix N of IFC
   a. (P158) (F135): IFC N103.6
   b. (P159) (F136): IFC N103.6.1.1
   c. (P160) (F137): IFC N103.6.1.1
   d. (P161) (F138): IFC N103.6.1.2
   e. (P117) (F107): IFC N103.1.1.4
   f. (P118) (F108): IFC N103.6.1.2
   g. (P119) (F109): IFC N103.6.2.3

Please note that any items that we do not get to in this hearing will be automatically transferred to the next scheduled hearing date and will be the first items on the agenda for that hearing.

Denver 2018 IFC-Smoke Control Committee Meetings

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https://global.gotomeeting.com/install/906987181
Proposal # P120-F110

Public Testimony in Support:
DFD currently will not allow a VFD bypass. And any SCS fan that needs to run at less than 60 HZ (sometimes as low as 12 HZ for stair fans) that running at 60 HZ could cause a very high pressure, causing stairwell or elevator doors to not operate. This takes out the option for a manual by pass switch.

Public Testimony in Opposition: None

Original Motion: As-Submitted (AS) – 2nd

Questions from the Committee to Proponent: None

Committee Discussion:
Would like to fix language in order to utilize this proposal.

Needs to have an override capability, considered a life safety measure.

Some of these are sold with bypass and then it has to be removed. This would not apply to atriums.

Modification: “With a manual or automatic bypass switch except where fans designed and set for 60 hertz, nominal.”

Final Motion: As Modified (AM)

Final Vote: AM 10-0

Additional staff or committee comments for the record:

Proposal # P113-F103

Adding a Design Exception: For existing buildings adding stairwell pressurization fans, the empirical method will be allowed. This method will require a blower door test kit to determine the required fan CFM and total static pressure to create 0.10” of differential pressure (not the required pressure but allows for a design safety factor). Once established, this fan CFM will be increased by 50% for design purposes.

Public Testimony in Support: None

Public Testimony in Opposition: None

Original Motion: Disapprove (D)

Committee Discussion:
Don’t think the code prevents anyone from doing this with what’s currently written in the code.

Committee members agree that this is already permitted. Doesn’t need to be codified.

Questions from the Committee to Proponent:
1. Evaluating existing buildings there is prescriptive methodology, not design criteria, but allows designers to be a little more flexible so is this necessary?
   a. Feel it is necessary to allow more flexibility.

Final Motion: Disapproved (D)

Final Vote: D Passes 10-1

Additional staff or committee comments for the record:
Proposal # P116-F106 to be heard with F21
We currently run most fans at 12Hz to 24Hz (20% to 40%). And it has been proven that fixed speeds of stairwell pressurization fans have been the best long-term solution – this is especially true with the new DFD requirement to make sure the 1-floor stair doors that open out will close against the stairwell pressure.

Public Testimony in Support: None
Public Testimony in Opposition: None
Original Motion: As-Submitted (AS); A/S with Intent to Modify (ASM); Disapprove (D)
Questions from the Committee to Proponent:
1. Looking to cut by 50%?
   a. Yes

Committee Discussion:
2 documents discussing the same thing. Wondering if we can identify and hear together but vote separately. P116 & F21. F21 is drop of 20% P116 50%

40% is the general rule for how oversized we are in Denver.

Not worried so much about CFM as the static pressure. If we size for ¼ inch normal CFM they would ride the curve and we would get what we want. 1 inch is contributing to oversizing as much as the CFM. In the field less than 1 inch we don’t get the performance out of the fans, they can’t overcome the resistance.

Committee would like the 20% in P21. Need to include static pressure and CFM.

Going to ½ an inch gives more flexibility with those minimums

Original Motion: F21 A/S with Intent to Modify (ASM)

Modification #1: Change 1.0 to 0.5
“System shall be designed 0.5 water column static pressure minimum at the duct penetration…”

Vote on Modification: Passes 10-0

Modification #2: Remove “Based on demonstrated performance of the building, the” Add “either dynamic static pressure or fixed speed controls shall be provided.”

Vote on Modification: 8-0 (1 committee member out of the room)

Discussion on Modification:
NFPA doesn’t address the number of stairway doors open.

Now we judge as sealed enclosure.

Committee Discussion:
Question about 30% drop instead of 50%. DFD wonder if it’s worth testing this for a few years to see what effect it has.

Changing static pressure will help.

Possibly stay with the 20% to baby step into this change. Proposal says “at least” so you won’t have to change out fans.

Discussion of 200 CFM instead of 160 CFM
Modification #3: Change to 10,000 CFM and 200 CFM per floor in excess of 15 floors.
Vote on Modification: Passes 10-0
Final Motion: As Modified (AM) F21
Final Vote: AM 10-0 Passes
Additional staff or committee comments for the record:

Proposal # P116 Withdrawn

Proposal # F22
This proposal reduces fan sizes by 10% with the intent of ensuring mechanical equipment operates within acceptable tolerances to avoid damage to controls or motors due to overheating because systems were tuned to speeds below manufacture prescribed parameters.

Public Testimony in Support: None
Public Testimony in Opposition: None
Original Motion: A/S with Intent to Modify (ASM)

Modification #1: Would like to represent static and dynamic. Use same 0.5-inch minimum language as last proposal. F21. (Change at both places that list 1.0) Follow same language as in previous proposal regarding “dynamic static pressure control shall be provided.”
Vote on Modification: 10-0 Passes

Questions from the Committee to Proponent: None

Committee Discussion:
10% reduction. Designed to stand on its own. Still goes to same token.

CFM per door may not be dependent on the number of floors, have to account door by door as well as the number of floors you have.

Transition between 15-16 floors is smooth here, not disconnect.

Numbers here are 10% and a conservative approach.

Final Motion: As Modified (AM)
Final Vote: AM 10-0 Passes
Additional staff or committee comments for the record:
Pressurization reduced by 10% with intent of responding to tighter buildings.

Proposal # P130
Revise Smoke Exhaust to Smoke Control
Public Testimony in Support: None
Public Testimony in Opposition: None
Original Motion: As-Submitted (AS) – 2nd
Questions from the Committee to Proponent:
Committee Discussion:
Aligning with base code. 909.3 struck out exhaust and changed it to control, just tying the sections together with similar language.
NFPA – Smoke control and sub sections smoke exhaust and smoke control.

909.15 for high rise buildings. Defined as smoke control systems and then broke down in to sub sections.

There is another proposal that addresses this same area of the code.

National codes are going to containment or how high we can make the smoke go.

**Support:**
909.3 changed last cycle exhaust changed to control for high rise buildings for smoke control.
909.15.3 just aligns the 2 smoke control sections.

**Opposition:**
This section is specifically talking about smoke exhaust. This change makes it inconsistent in the code.

This is describing a smoke control system, there are exhaust aspects to it, but this a requirement for a smoke control system.

When put in context, smoke exhaust method is one of those components. Technically need to change those to smoke control instead of exhaust dampers. It makes sense to keep this as is.

**Final Motion: As Submitted (AS)**
**Final Vote: AS 3-6 Fails**
**New Motion: Disapproval – 2nd**
**Final Vote: 6-3 Passes**

**Additional staff or committee comments for the record:**

Request for F23 and P170, P131 to be heard together.
F24 and F17 to be heard together.

**Proposal # F23, F24, P131, F17, P170**

**Committee Discussion on this group of proposals:**
All are regarding Make Up Air Provisions

**P131** basically section 403 moved to 909. Intent is to do a true movement of smoke, you have to distribute air to all parts of the building, cannot do from the core of the building when the core is contained.

**F17** very subjective currently on acceptance testing. Takes a lot to establish what’s satisfactory. When these are done the night before CO it can cause things to be uncomfortable.

Concern of creating complex systems that we can’t maintain over time. Reliability of static pressure sensors is also in question. Manufacturers can’t give an answer of the reliability.

**F23** forces us to add a system, **P170** allows to open the door.

Purge systems – we only evacuate the 3 floors close to the alarm floor. Keep HVAC intact for the rest of the building. Contain to room of contents, rest of building operates as normal. If we go to purge, we have to dump the building and manipulate the HVAC to achieve this. Lot of complexities for union side we have to rework depending on what we do here.
Shared shaft almost exclusively residential, small amount of exhaust and still 2 stairways and 2 hoist ways to exhaust.

In Denver systems if someone activates a pull system, system could run and you blow up the balloon, no longer achieving containment. Need to keep pressure differential operation during that scenario as well.

Energy code for commercial, all commercial buildings will get blower door tests. Buildings are going to get tighter.

If we approve F17 there are consequences to the 85%. In the field we used to design 60 and 15 exhaust rates, changed in 2008 to 15 and 5. Brought it way down on our exhaust capabilities. Offices being designed for 5 air changes per hour. In last 5 years balancers setting them at bare minimum less than 1 air change. We are supposed to have smoke control systems and we are performing at less than 1 air change per hour. Design system but performing lower, that is unacceptable, never the intent. If exhausting for 5 we should be designing somewhere close to 5.

**Proposal # F17**

This amendment would allow Denver’s method to better align with the IBC provisions and provide greater rates ensuring building occupants and responding firefighters are better protected as intended by these provisions.

*Public Testimony in Support: None*

*Public Testimony in Opposition: None*

*Questions from the Committee to Proponent: None*

*Committee Discussion: None*

*Original Motion: A/S with Intent to Modify (ASM) – 2nd Modification:*

*Support of Modification:*

Fire department would like to see movement, what is the correct amount of movement that can be measured. 85 is from 4 air changes.

Using balancing reports, this verifies how it’s performing.

Learning curve will have cost associated, reviewers and balancers learn this it will be better.

Compartmentation is the floor, always been the way, contained passively and actively.

*Opposition of Modification:*

DFD if national dictates 4 air changes as mop up, we have to be higher because we have smoke control systems in Denver. So that would put us at 4.75

Accomplishing this on some buildings by using hoist way fan cost of ½ million dollars on these buildings, in a normal building with DOAS units, make up air fan 5 air changes per hour. Cost associated.

Can be achieved through opening doors, as an engineer can’t go to a standard that tells how to design make up air for a containment system. Exhaust system gives you direction, but not for containment.
If we get there, we are going to have HJ say they want the smoke out of the perimeter.

**Final Motion:**  As Submitted (AS);  As Modified (AM);  Disapproved (D)

**Final Vote:**

**Additional staff or committee comments for the record:**

85% with door open, sealed up accept 20% of the design rate

Before looking at rules changed, design to 5 air changes to 1 inch, when we test, we test pressures, door pulls, whatever comes out of air changes comes out. Today DFD said we are going to recognize 403 purge mode, a lot less requirements, it’s mop up not life safety. If we have a system that has an exhaust fan, we provide more oomph on the floor by exhausting it. We need to evaluate the requirement for purge in high rises. After the event how are going to exhaust, merit to help containment mode with exhausting, shouldn’t it have capability to run 85% of the designed air changes. Is the concept exhaust fan helps containment should be consider purge mode as viable add on?

DFD Union says we don’t want people controlling smoke control systems.

If we have system capable of design, why can’t we utilize full design 85% of that. Allow mechanisms.

Change in conditions that as a committee we need to take in to account. Occupant loads in new code have changed, high-rise buildings with occupant loads that exceed exiting capability of the floors. Floor plate now split up into multiple zones, relying on smoke control systems for tenable conditions. So now we have a lot more people than we can evacuate, one stairway is designated for fire department use and we are down to 1 stairway for evacuation.

NY doesn’t recognize smoke control; they consider it post purge. We have engineers who want smoke control, how to create tenable environment for people to get out of this building. I want to mop it up, pressurize it out and be done. Most successful systems are the ones we see here in Denver.

Motion to Table all 5 proposals until July 30th.