Public Testimony in Support:
Building Dept. – This is an extraction out of Appendix generated a few code cycles ago through adapting NFAP 415 to DIA more specific design criteria. When building was designed there was no code in effect for airports, because this there are a wide variety of special agreements, administrative modifications and memorandums of understanding and agreements on how things were to be built. Those provisions created were carried forwarded. Then NFPA 415 was brought in to the IBC. One portion of this is smoke control, there are some unique aspects of how DIA is built and how smoke control system operates. What you see is the tweaks to Appendix S to bring it more closely in line with how building is constructed and regulated and is supposed to function. Some definitions added with DIA being unique. Denver has distinct terminal and concourse buildings that have different functions which is different from other airports. There is one functionality change that smoke control system used to be triggered on multiple initiating devices, this is now on one sprinkler single flow switch. Previously they would report surges and surges would set off smoke control system, so they wanted a validating device. No data to back that up after extensive research. This proposal is to initiate smoke control on a single water flow, this also reflects that during last code cycle a lot of the detection was removed from the concourses, fewer opportunities to initiate a response to a fire event.

Public Testimony in Opposition: None

Questions from the Committee to Proponent:
1. Initiation is a sprinkler zone, proposal says 2 smoke detectors.
   a. It says any detection device, takes 2. Water flow is not a detection device. 2 detectors same zone or 1 flow. Could be manual pull could be the other validating, but manual pull can’t be by itself.
2. “Building and smoke control exhaust shall be automatically initiated with any automatic device, for example suppression water flow or automatic detection”, doesn’t that say 1 device.
   a. Yes, you would have to read the exception. Charging statement is any single device.
3. What are the boundaries of smoke control in airport?
   a. Each building is unique, in the concourses hold rooms are smoke zones, Center core is its own smoke zone, Pods where you have retail, restaurants - sub cores are smoke zones. At end of concourses there are partial hold rooms they are their own zones as well. In terminal different smoke zones on different floors. It is broken up in thirds (East, West Bands) each are their own smoke zone. This will be changing with remodel of terminal building, will now be split up by Sterile (past security) and Non-Sterile (before security) because response is different. Relocation for sterile zone, non-sterile is evacuation.
4. Are there soft boundaries?
   a. A little bit, soft curtains in some places. No hard barriers.
5. Is the atrium its own zone?
   a. Broken in to 2 zones, Sterile (past security) Non-Sterile (before security).
6. Treating as atrium where you are trying to get smoke above 8 feet?
a. All the modeling that was done we held ceiling at 6 foot 6. So, yes treating as an atrium.

7. Where is make up air coming from?
   a. Exterior Wings, east and west side

8. What about trains and terminals?
   a. Covered in the latter portions of this proposal.

Original Motion: *Divide in to 8 sections based on each section 4.6, 4.6.1,4.6.2,4.6.3,4.6.4,4.6.5,4.5.6,4.6.7 and vote them separately.*

Committee Discussion:
Would like to split up proposal by section.

Proposal # 470 Section 4.6
Original Motion: As Submitted
Reason: This brings out and acknowledges 2 separate elements needing to be addressed, concourse and terminals.
Discussion: Header should be accepted as shown.
Final Vote: As Submitted- 8-0

Proposal # 470 Section 4.6.1
Original Motion: *A/S with Intent to Modify (ASM)*

Committee Discussion:
- The changes here are straightforward, we did change the terms, but mostly just clarifying not introducing anything new.
- Regarding terminals and concourses, there is a lot more involved than those two areas.
  - Those are addressed in later sections. Trains and Tunnels are considered part of the terminals in general.
- Last sentence says 4.5.2 where does that point?
  - It might be helpful to put a more specific reference here, so it is clear where this is directing you.
- In 4.6.2 Design Criteria is that only design criteria for 4.6.1 or is it for 4.6.3 Tenant spaces and similar rooms.
  - Should be for 4.6.1, 4.6.3 needs to have 4 air changes per hour added.
- Committee wanted to discuss permanently fixed air craft loading walk ways, separated by 1-hour fire resistance barrier.
  - NFPA 415 requires walk ways be positively pressurized during a ramp fire emergency, they don’t give specific criteria, not tied to the smoke exhaust system in the concourses. This says we need to maintain 1-hour separation between passenger boarding bridges we have now and if it doesn’t it has to become part of the smoke control system. The goal is to accomplish passenger boarding bridge pressurization by pressurizing concourses to a fixed number and maintaining it in all weather conditions. Ideal situation would be if we can automatically initiate the pressurization when it was necessary (ramp fire) but there are not detectors listed for temperature ranges they would be exposed to. Air that pressurizes bridges has to come from a non-contaminated source.
Pumping up the concourses and maintain positive pressure at all times is the only real way to accomplish what we need.

- All doors are rated for 45 minutes with self-closers and modeling based upon the number of doors you would ever have open. Percentage that we accepted based on door opening data that was analyzed. With 80% of doors open and concourse pumped up to .05 should be enough to keep all bridges positive pressurized up to 22 miles per hour wind case.

- On new bridges they are introducing 400 CFM per bridge in to bridge whenever door switch indicates the door is open this is 100% outside air and comes through dedicated make up air unit with a heating coil.

- With walkways does this replace requirement for detection, does this need to be documented in Denver amendments that this is the way we are going to do it?
  - It will be, right now it’s still in design phase. It’s an 8-month lead time in between ordering the bridge and when we can test it. So we have worked out to use rigorous modeling up front to get best design criteria we can come up with based in science and permit that, so design has to match criteria and we permit that design and monitor it on the backside to see how it performs. Current process of demonstrated performance and then permitting doesn’t work in the case of the airport, that method becomes impractical. Permitted size of HVAC system and with that they are able to maintain a .05 at the concourses. When we test, we will verify design criteria and leakage on the concourses.

- Some history behind this, in the center cores when the airport was originally built each quarter of that has a dedicated smoke control system in addition to smoke control at top of the atrium. In 2008 they made the four smoke control systems and the quarters manual because during tenant finishes things have been changed and don’t function properly. It made more sense to allow tenant spaces to pour out in to the atrium and be exhausted through the top. Part of that process there is a natural bulk head in those tenant spaces, code requires detector on tenant side for early activation and through evolution of smoke zones we took it a step further and said let’s put heads at 6 feet on center as well. By putting in as 18 inches it codifies it. Draft curtain needs to be removed due to the change in smoke zones. Want the draft curtains not in the corridor want them in the tenant spaces.

**Modifications:**

- Last sentence addresses 4.5.2 but isn’t specific, should say “… in accordance with IBCA Appendix Chapter S”
- Remove “A” right after Requirements –amend to just say “Smoke control systems shall be provided”.
- Line 4 “Smoke Control Systems” instead of “The smoke Control System”.

*Vote on Modifications: 9-0*  
*Final Motion: As Modified*
Proposal #470 Section 4.6.2
Public Testimony in Support: None
Public Testimony in Opposition: None
Discussion:

- Committee concerns about using the words “at least”. Could be confusing with tenant space greater than 5,000 feet. Doesn’t define between the two 20,000 CFM and 4 air changes per hour. Typically, the code uses “minimum” instead of “at least”
  - If you have a small tenant you have at least 4 air changes per hour, you wouldn’t have 20,000 CFM, if it was a larger space and you needed 25,000 you would need to provide at least 20,000 CFM.
- Idea is you’re going to do 4 air changes until it equates to 20,000 CFM and keeps it at 20,000 CFM. Need to determine which of these metrics we are asking to be met.

Questions from the Committee to Proponent:
1. Seems like we are limiting CFM to 20,000 or 4 air changes per hour no matter size of space?
   a. Intent is to not have an exhaust system less than 5,000 square feet. Larger than 5,000 square feet will be addressed in 4.6.3.

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

Modifications:
- In front of Design Criteria add Terminal & Concourse.
- Change to “Shall provide the greater of 4 ACH or 20,000 CFM”
- Strike “Minimum”.

Vote on Modifications: 9-0 Passes

Final Motion: As Modified
Final Vote: AM 9-0 Passes

Proposal # 470 Section 4.6.3

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

Committee Discussion:

- Do we have smoke detectors now on tenant side?
  - Yes, on the tenant side.
- Need to define amount of exhaust for tenant spaces, suggest adding minimum of 4 air changes.
- Some of the larger tenants are being asked to provide make up air. Questions in committee about whether we need to address that within this section. Some committee members fell that dealing with make up air here could become confusing. Agreed that we should add a statement to declare that an appropriate source of makeup air should be included.

Modification #1: After words Section 4.6.1 add new sentence “The Smoke Removal system shall provide a minimum of 4 air changes per hour with an appropriate source of makeup air”
Vote on Modification #1: 9-0 Passes
Modification #2: Title should be “Large Tenant Spaces and Similar Rooms Design Criteria”
Vote on Modification #2: Passes 9-0
Final Motion: AM
Final Vote: AM Passes 9-0
Additional staff or committee comments for the record:
Editorial:
- Reference for section 4.5.2 to match above “… in accordance with IBCA Appendix Chapter S”
- Zone per “DBCA Appendix S Section 4.6.1. “Separate smoke zones shall” and remove “must”

Proposal #470 Section 4.6.4
Original Motion: As Submitted with intent to Modify
Modification:
- Exception 2 says “Existing Airport Terminal Buildings” should say “Terminal and Concourse Buildings” for consistency.
- Remove “Airport and Building” from title of this section.
Vote on Modification: Passes 9-0
Final Motion: As Submitted
Final Vote: AS 9-0
Additional staff or committee comments for the record:
Editorial:
- Addition should be plural
- Intent is to say Terminal and Concourse in all sections for the entirety of 4.6

Proposal # 470 Section 4.6.5
Original Motion: As Submitted
Final Motion: AS
Final Vote: AS Passes 9-0
Additional staff or committee comments for the record:
- Spell out “four”.
- Tunnel should be plural, and system should be plural.
  - “Baggage handling equipment tunnels and AGTS tunnel smoke control exhaust system”

Proposal # 470 Section 4.6.6
Original Motion: A/S with Intent to Modify (ASM)
Discussion:
- Committee concerns about incident response. It was clarified that everything is 24/7 monitored. Any fire command centers have duplicity of operating everything in the whole facility, there is a monitor in each command center that shows where the incident is in order to address the incident.
Modification:
- Take out airport and building throughout text.
- Remove “automatically” from 2nd line.
- Exception 1 last sentence Remove “or as the second device verification to the initial automatic detection device”. Remove “consecutive” Remove “be required to”
- Exception 2 – “Baggage handling equipment tunnels”

Vote on Modification: Passes 9-0
Final Motion: As Modified
Final Vote: AM Passes 9-0
Additional staff or committee comments for the record: None

Proposal # 470 Section 4.6.7
Original Motion: As Submitted
Discussion:
- So basically, we aren’t going to chase the fire. First smoke zone that is activated locks in any other is noted, but you have to manually activate it even if it’s the adjacent zone.
  - This procedure is the current operation in place.
- If fire is on concourse level and we were exhausting it if the smoke got in Amex we wouldn’t want to turn on fans and draw it in. Overall this is how things are programmed at DIA right now.

Final Motion: As Submitted
Final Vote: AS Passes 9-0
Additional staff or committee comments for the record:
Strike out airport and buildings throughout text.

Committee concern about P9 regarding Appendix S