National Fire Protection Association

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M E M O R A N D U M

TO: NFPA Technical Committee on Handling and Conveying of Dusts, Vapors, and Gases

FROM: Joanne Goyette, Administrator, Technical Projects

DATE: December 21, 2011

SUBJECT: NFPA 654 ROC **TC FINAL** Ballot Results (A2012)

The Final Results of the NFPA 654 ROC Letter Ballot are as follows:

28 **Members Eligible to Vote**
0 **Not Returned**
20 **Affirmative on All**
6 **Negatives** (B. Chastain, V. Ebadat, J. Going, J. Sutton, R. Taylor, and E. Ural) (on one or more comments as noted in the attached report)
2 **Abstentions** (H. Febo and B. Stevenson) (on one or more comments as noted in the attached report)

There are two criteria necessary to pass ballot [(1) affirmative $^{2}/_{3}$ vote and (2) simple majority].

(1) The number of affirmative votes needed for the proposal/comment to pass is **18.**
(28 eligible to vote – 0 not returned - 2 abstentions = 26 × 0.66 = 17.16)

(2) In all cases, an affirmative vote of at least a simple majority of the total membership eligible to vote is required. This is the calculation for simple majority:
[28 eligible ÷ 2 = 14 + 1 = **(15)**]

Reasons for negative votes, etc. from alternate members are not included unless the ballot from the principal member was not received.

According to the final ballot results, all ballot items received the necessary $^{2}/_{3}$ required affirmative votes to pass ballot.

654-1 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0

3.3.x.2 Dust Flash Fire Hazard Area (Log # 13)

654-2 Eligible To Vote:28 Affirmative: 27 Negative: 0 Abstain: 1 Not Returned: 0

3.3.x Enclosureless Dust Collector and A.3.3.x (Log # 21)

Abstain

Stevenson, B. I do not agree with the inclusion of enclosureless dust collectors because they have been known by me personally to have been the locus for deflagration and the need for a definition for them would not be necessary if they are not allowed as is the case in the current edition of the standard. Please see my further comments concerning this matter at 654-30 (Log #3).

Affirmative with Comment

Febo, Jr., H. The committee statement says "These items addressed as part of action on 654-1 (Log# 13). In fact I believe the correct reference is to action on 654-30 (Log# 3). This should be corrected.

654-3 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0

3.3.4 Combustible Dust (Log # 1)

654-4 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0

3.3.4 Combustible Dust (Log # 12)

654-5 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0

3.3.4 Combustible Dust (Log # 17)

654-6 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0

3.3.5 Combustible Particulate Solid (Log # 20)

654-7 Eligible To Vote:28 Affirmative: 26 Negative: 2 Abstain: 0 Not Returned: 0

3.3.11 Dust Collector, 7.3.2.x, 1.1.1, 10.2.2, 10.2.3.1,9.1.2.1, 6.1.6, 7.3.3.x, 7.4.1, and 7.8.3.1, A.3.3.x, and A.7.3.2.x (Log # 2)

Negative

Chastain, B. My negative vote is related to paragraph:

7.3.2.5.3 No system shall include manually adjustable control devices (e.g. slide gates, butterfly valves, etc.), except for exclusively maintenance purposes, or on/off purposes, that allow personnel to adjust the air flow into the system.

Negative vote substantiation:

Trying to create a restriction in NFPA 654 that blast gates must be banned in favor of "balance by design" as described in ACGIH places a costly retrofit burden on industry that is not justified by the loss history; there are few of these designs in place to know that they work well. To accomplish balance by design retrofits would often require significant redesign with duct diameter changes and fan changes to provide higher pressure drop; it is much easier to apply in new systems but there is no flexibility for changes. True, blast gates get adjusted by people who don't know any better but they can be managed if secured as required in NFPA 91 and the employees are educated. Having a Balance by Design system is no guarantee of long term performance if the plant does not have systematic monitoring and maintenance to deal with the usual dust collection system failure modes and get it back on track.

The key improvement that NFPA 654 could make in its next edition is to clearly state that dust collection systems should have a commissioning or re-commissioning event to ensure that all hood airflows are within design parameters and that all sections of the duct have conveying velocities within design parameters (typically + 10%) and static pressures recorded. This commissioning data is a key turnover to operations for monitoring and maintaining the systems long term. In addition, NFPA 654 should have a requirement that the operations group must have a monitoring and maintenance plan to intervene as deviations from the commissioning data develop before the system is seriously degraded. Lack of commissioning to prove performance and the absence of systematic monitoring and maintenance programs are the major causes of poor dust collection system, coupled with lack of change management.

All of these points are already covered in NFPA 91 although they are not stated so clearly. If commissioning, monitoring & maintenance, and change management data and procedures are in place at a site, they provide a reasonable risk management approach to allow sites to choose between balance by design, balance with orifices, or balance with blast gates. Below are the sections below from NFPA 91 that already address these issues.

Excerpts from NFPA 91:

4.4 Design Requirements.

4.4.1* An exhaust system shall be inherently balanced, or a means shall be provided for balancing the system.

A.4.4.1 "Inherently balanced" means the system has been designed using the velocity pressure method described in the ACGIH Ventilation Manual for Design.

4.4.2 Where used, balancing devices shall be secured to prevent inadvertent adjustment or loss of transport velocity.

4.4.3 When dampers or louvers are used for weather or backdraft protection, they shall be located on the clean-air side of the filtration system.

4.4.4* Building components shall not be used as parts of a duct system.

4.4.5* Discharge shall terminate away from outside air intakes to prevent material from entering the air intakes.

4.4.6 The rate of airflow at each hood or other pickup point shall be designed so as to capture, convey, and control the material. [654:7.3.2.3]

4.4.7* All ductwork shall be sized to provide the air volume and air velocity necessary to keep the duct interior clean and free of residual material. [654:7.3.2.4]

A.4.4.7 For guidance on determining air volume and air velocity, refer to Industrial Ventilation --A Manual of Recommended Practice, published by the American Conference of Governmental Industrial Hygienists (ACGIH). [654: A.7.3.2.4]

4.4.8 Hoods.

4.4.8.1 Materials shall be confined to and removed from the
area where they are generated, by hoods or enclosures and an
air-moving device.

4.4.8.2* When it is not possible for the process to be enclosed or hoods installed, local exhaust ventilation shall be permitted.

MANAGEMENT OF CHANGE ITEMS

4.4.10 Additional branch ducts shall not be added to an existing system without redesign of the system.

4.4.11 Branch ducts shall not be disconnected nor unused portions of the system be blanked off without provision for means to maintain required airflow.

4.4.12 Flexible ducts shall be permitted to be used only at inlets where movability or portability is required.

Chapter 10 Testing and Maintenance

10.1 Retroactivity. The requirements of Chapter 10 shall be applied retroactively.

10.2 General. Exhaust systems shall be tested, inspected, and
maintained to ensure safe operating conditions.

10.2.1 The responsibility for maintenance shall be assigned to trained personnel who are capable of recognizing potential hazards.

10.3* System Test.

10.3.1 When installation of a new system is complete, the
system shall be tested to demonstrate performance before acceptance
by the user. [This is the COMMISSIONING REQUIREMENT]

10.3.2 Modified systems shall be retested. [This is the RE-COMMISSIONING REQUIREMENT]

10.3.3 Test results shall be recorded and maintained for at least 2 years or two test cycles, whichever is greater. [This is a COMMISSIONING REQUIREMENT]

10.3.4* Existing systems shall be tested annually by the user to demonstrate continued performance.

10.3.5 Where the manufacturer's requirements are more stringent or where conditions of service and documented past test results dictate, testing frequencies shall be permitted to be

adjusted accordingly, but not to exceed every 2 years.
10.4* System Inspection.
10.4.1 All system components shall be inspected monthly.
10.4.2 When the manufacturer's requirements are more stringent or where conditions of service and documented past inspection results dictate, inspection frequencies shall be permitted to be adjusted accordingly, but not to exceed quarterly.
10.4.3 Inspection results shall be recorded and maintained for at least 2 years.
10.4.4 The user's operational and maintenance program shall include all of the manufacturer's listed procedures that are applicable to the equipment.
10.4.5 An operational and maintenance checklist shall be maintained.
10.4.6 Accumulations of conveyed materials and residues shall be removed from hoods and enclosures, ducts and fittings, and air-moving devices.
10.4.7 The ducts shall be checked for obstructions such as improperly adjusted dampers or shutters.
10.4.8 Filtration systems shall be inspected and filters cleaned or replaced as required.
10.4.9 Air-moving devices shall be inspected for belt tension and wear and lubrication.
10.4.10 Hoods and enclosures shall be inspected for proper confinement and removal of materials.
10.5 Cleanliness. Ductwork shall be examined periodically to determine adequacy of cleaning frequency.
10.6 Maintenance Program.
10.6.1 All system components shall be maintained in good operating condition.
10.6.2 A written maintenance program shall be established.
10.6.3 The program shall include any and all recommendations provided by the manufacturer.
To exclude the use of secured slide gates, dampers, blast gates, or balancing orifices in existing industrial dust collection systems will be an undue burden on industry from a cost perspective and is counter to their allowance and the requirements in the present edition of NFPA 91. Although not using these devices in new systems and balancing by design (e.g. via the velocity pressure method) is desirable, industry has employed systems with these devices, presently is using dust collection systems with these devices (blast gates, dampers, slide gates, etc.) and prohibiting their use (secured) on an existing balanced dust collection system where blast gates, dampers and slide gates are used and secured is not reasonable or feasible. In NFPA 91 these devices are allowed. As a result, I urge that the "prohibition" for these devices presently contained in paragraph 7.3.2.5.3 be removed from the planned NFPA 654 2013 edition.

Stevenson, B. The reference is 7.3.2.5 to the ASME Boiler Code is in conflict with 69 where the subject is more properly addressed. The proper way to handle this is to refer to 69 and eliminate any reference to the Boiler Code.

Affirmative with Comment

Febo, Jr., H. There are a number of places where the new text, which is extensive, does not seem to be properly indicated. For example, I believe all of A.3.3.11 is new text, much of A.3.3.20 is new, etc.

654-8 Eligible To Vote:28 Affirmative: 26 Negative: 1 Abstain: 1 Not Returned: 0
3.3.14 and 9.3.1 (Log # CC2)

Negative

Ural, E. The requirement for the MIE testing without inductance is an unnecessary requirement. The fact that inductance may reduce the MIE should be explained in the Annex. Proposed mandatory text gives the false impression that MIE values obtained with inductance are unsafe, while, in reality, they offer a greater safety margin.

Abstain

Febo, Jr., H. A lot of the material in this is new and not underlined nor is some deleted and changed material noted. For example the current 9.3.3 appears to be completely replaced with almost 2 pages of ballot text however what happens to 9.3.4 in the current text? It looks like there is a new 9.3.4 in this new material so that the existing 9.3.4 will be kept and renumbered. There is also a table `use of different types of FIBCs' but no indication of where it belongs. I assume Annex but I don't like to vote for assumptions thus my abstain.

654-9 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
3.3.14.1.1 Type A FIBC (Log # 19)

654-10 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
3.3.14.1.3 Type C FIBC and A.3.14.1.3 (Log # 22)

654-11 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
4.2.3 (Log # 14)

654-12 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
4.4.1 (Log # 15)

654-13 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
4.6.2 (Log # 23)

654-14 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
5.1.1 (Log # 24)

654-15 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
5.3.2.1 and 5.3.2.2 (Log # 25)

654-16 Eligible To Vote:28 Affirmative: 27 Negative: 1 Abstain: 0 Not Returned: 0
6.1 (Log # CC3)

Negative

Ebadat, V. The concentration that is used in evaluating the flash-fire hazard [in paragraph 6.1.5.2 and A.6.1.5.2] probably should be the Minimum Explosible/Combustible Concentration rather than the “worst-case” [near-stoichiometric] concentration. Use of the “worst-case” concentration would “allow” a dust accumulation that would be about five times the weight that would produce an “MEC” cloud. Also, was it the intention of this equation to avoid/prevent consideration of (1) the average dust-layer thickness and (2) the fraction of the floor area that would be covered by dust accumulations? Further, is this equation “over-simplified”? The equation contains the product of P [0.05] and Afloor, thus inferring that a burning cloud of dust that occupies 5% of the floor area would result in a 5% probability of burn injury [where the probability of burn injury for such a small area is likely to be near zero]. That is, should the fractional area occupied by the burning cloud be separated from the probability of exposure to that cloud? Of course, if P = 1.0, the burning 2-meter-high dust/air mixture would occupy the whole floor, and the probability of burn injury would be 1.0.

The paragraphs starting with 6.1.5.1 [and A.6.1.5.1] are incorrect and need to be revised. For example, a “worst case” for structural response would be a Dynamic Load Factor [DLF] of 1.0, where there is no “benefit” for an extremely-short exposure to pressure. That is, the structure would fail at a pressure that is equal to the prolonged “static” pressure, regardless of how short [microseconds, for example] of the duration of the applied pressure. A typical DLF would be 1.5, where a structure could tolerate a pressure that was equal to 50% greater than the static pressure resistance, if the pressure was applied briefly. Further, the equation 6.1.5.1 should show “Pes x DLF” rather than “Pes/DLF”. This equation could be re-written as:
Ptolerable/Pmaximum = Waccumulation (ndispersal) / CworstAfloorHroom, to conform to the “partial-volume” equation, and Ptolerable would then be Pes x DLF. Two examples are presented in the attached spreadsheet, showing how the area covered by accumulated dust to 1/32 inch would be increased to 11.6% of the floor area [from 7.7% of the floor area] if the DLF was 1.5 instead of 1.0.

Affirmative with Comment

Febo, Jr., H. Prior to publication some editing is needed in the example in A.6.1.1.5 such as 464 g/pound not 453.6, 2.03 inch instead of 2.03125 etc. The calculations are just not that accurate.

Sutton, J. While I am still not convinced on the 0.25 entrainment factor used in the two Mass Methods, I do believe this is a good direction to proceed with further research, and there is a research paper now produced by the Fire Protection Research Foundation that indicates that the 0.25 value for the entrainment factor is in the area even though additional testing is still needed to further validate this value. Also, this ROC report retains the old layer depth criteria, which can still be used to evaluate the dust hazard. Therefore, I believe the ROC report to be a good compromise.

Ural, E. There is a typo in Eq. 6.1.5.2. The probability factor p seems inadvertently omitted in the ROC document.

654-17 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
6.1 and 6.2 (Log # 18)

Affirmative with Comment

Sutton, J. See my Comment on Affirmative on Comment 654-16 (Log #CC3).

654-18 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
6.1.2 (Log # 16)

Affirmative with Comment

Sutton, J. See my Comment on Affirmative on Comment 654-16 (Log #CC3).

654-19 Eligible To Vote:28 Affirmative: 27 Negative: 1 Abstain: 0 Not Returned: 0
6.1.2.1 through 6.1.6.2 (Log # 9)

Negative

Taylor, R. 6.1.2.3 Inconsistencies between NFPA 654 and NFPA 2113 result in confusion to the end users as to determining when FR clothing is required.

654-20 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
6.1.4 (Log # 10)

654-21 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
6.1.4 (Log # 26)

654-22 Eligible To Vote:28 Affirmative: 27 Negative: 1 Abstain: 0 Not Returned: 0
6.1.7 (Log # 27)

Negative

Stevenson, B. I agree with the submitter because the ignition source is an important determining factor for the level of risk. The dust is the hazard.

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654-23 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0

6.1.8 (Log # 11)

Affirmative with Comment

Taylor, R. Inconsistencies between methodology for determining need for FR garments are perceived between NFPA 654 and NFPA 2113 (particle size, moisture, etc.) Once the hazard is determined, an PPE Hazard Assessment may be used to determine PPE requirements.

654-24 Eligible To Vote:28 Affirmative: 26 Negative: 2 Abstain: 0 Not Returned: 0

6.2.3 (Log # CC5)

Negative

Sutton, J. The ROP report prohibited separation to be used to protect the surrounding areas from a dust explosion hazard area. While this may be overly conservative in some situations, a minimum distance of 35 ft. separation allowed by this ROC report goes too far the other way. If a dust explosion occurs, 35 ft. separation is very likely to be inadequate and all of the provisions of 6.2.3.1.1 of this ROC should be evaluated to establish what the correct separation distance should be, if any.

Ural, E. I believe this ballot item is published incorrectly. I understand the Annex paragraph A.6.2.3.1.1 was discussed and rejected during the Committee meeting, and should not have been published in the ROC ballot. The rejected text shown in A.6.2.3.1.1 was inspired by my presentation to the Committee on how the separation distance can be determined by an engineering evaluation. However, the form published in the ROC has several serious errors and omissions. Furthermore, while the 35 ft separation may arguably be OK for operations involving welding, cutting, and other hot work, it is nowhere nearly adequate for most secondary explosion scenarios addressed in this section.

Affirmative with Comment

Febo, Jr., H. Editorially, in the A.6.2.3.1.1 example for the 3 dimensional expansion, the separation distance is 35 ft not 30 ft per 6.2.3.1.3.

For equation A.6.3.3.1.1, the units and definition for all terms should be included.

654-25 Eligible To Vote:28 Affirmative: 26 Negative: 2 Abstain: 0 Not Returned: 0

7.1.4 (Log # 6)

Negative

Going, J. I am not in agreement with the statement (para 4) that connecting ductwork less than 4" is grounds for exemption, as based on the quotation from Guidelines for Safe Handling of Powders and Bulk Solids, ".. transmission would seem to be low and may be ignored...". There is experimental work that suggests otherwise. Pineau studied 0.1 and 1 m^3 enclosures with pipe diameters 25, 50, 100 mm and larger. Dust was injected into the 100 mm pipe but not into the 25 and 50 mm pipes and there was no pneumatic flow. Propagation was not 100% of the repeated tests but was as low as 10%. On the other hand, propagation was observed in 3 out of 6 tests with the 0.1 m^3 enclosure and a 50 mm pipe, 10 m in length, Kst 131 b.m/s (see Table 10). It was not conclusive that at less than 4 inch diameter, propagation ceased to occur.

Other reports provide additional equivocal results. Matsuda studied the effect of flow velocity on flame propagation using 3 and 4 inch pipes that were 37 to 87 m in length and connected to a vented dust collector. Dust was injected into a flowing stream and ignition was made in the pipe. He recorded either an explosion at the dust collector (full propagation), partial propagation or no propagation. Propagation from the ignition source to the dust collector did occur within flow velocity and concentration limits.

Holbrow reported on flame propagation between interconnected vented vessels. Among the many tests was a series using two 2 m^3 vented vessels with a 150 mm (6 inch) by 5 to 10 m connecting duct using toner dust. While no flame speeds were reported, flame did propagate from the primary to the secondary vessel. Unfortunately no smaller pipes were studied but it would be difficult to conclude that reducing the diameter to 6 to 4 inch would stop propagation.

Roser et.al studied flame front propagation between interconnected process vessels using dust fuels. He shows in Figure 15 that flame propagated from a 9.4 m^3 vented enclosure through a 100 mm pipe that was 22 m in length. This test used maize starch, ~300 g/m^3 at a conveyance velocity of 30 m/s. Flame speed was ~200 m/s at 10 meters.

Vogl studied ignition of maize starch at the open end and at the midpoint of a 100 mm pipe with 30 m/s conveyance velocity. The testing did show that a reduction of pipe diameter did reduce the flame velocity and pressure, but it also showed that flame did propagate with, and against flow in the 100 mm pipe.

All of these studies indicated that flame propagation down a 4 in (100 mm) duct is a real possibility. It would be difficult to conclude that there is no risk of flame propagation when the duct is smaller than 4 inch.

References :

Pineau, J.P, Seminar Course on Dust Explosion Venting. Mechanism of the Propagation of Dust Explosions in Elongated Vessels. Londres, 1987

Matsuda, T, Toyonaga, K, Nozima, Y, Kobayashi, M, Shimizu, T, Some Observations on Dust Explosibility in a Pneumatic Transport system, Journal of Powder and Bulk solids Technology, 6, 22, 1982

Howbrow, P, Andrews, S, Lunn, G, Dust Explosions in interconnected vented vessels. Journal of Loss Prevention in the process industries, 9, 91, 1996.

Roser, M, Vogel, A, Radnadt, S, Malalasekera, W, Parkin, R, Investigations of flame front propagation between interconnected process vessels. Development of a new flame front propagation time prediction model. Journal of Loss Prevention in the process industries, 12, 421, 1999.

Vogl, A. Flame Propagation in Pipes of Pneumatic Conveying Systems and Exhaust Equipment, Process Safety Progress, 15(4), 219, 1996

Ural, E. I agree with most of the statement made by Dr. Going.

Affirmative with Comment

Document # 654

Ebadat, V. There is an approved proposal to add language that will exclude explosion isolation upstream of dust collectors if several conditions are met including # 2 - connecting ductwork is smaller than 4 inches (100 mm) in diameter. This requirement begs the question, does this mean all of the ductwork, portions of it, etc. must be smaller than 4 inches? In a typical dust collection system there may be many different sizes of duct the largest sections being further downstream, but as we get further upstream to the collection points the ductwork transitions into smaller diameter sections. Does the work that was performed to justify this minimum diameter inclusion provide some guidance that we could insert into the standard, as far as this is concerned?

Floyd, L. John Goings negative is persuasive. However, Vogel, in the same article referenced by John, developed a yes/no correlation for flame propagation as a function of Kst, conveying velocity, and pipe diameter. The topic needs further review by the committee.

654-26 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
7.2.3.3.3 (Log # 28)

Affirmative with Comment

Stevenson, B. Clearly this should be included in the document, but I understand that it cannot be as it has been deemed to be "new" material.

654-27 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
7.10.9.4 (Log # 33)

Affirmative with Comment

Stevenson, B. See my Comment on Affirmative on Comment 654-26 (Log #28).

654-28 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
7.12.2 (Log # 7)

654-29 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
7.12.2.5 (Log # 29)

654-30 Eligible To Vote:28 Affirmative: 26 Negative: 1 Abstain: 1 Not Returned: 0
7.13.1.1.2(4) (Log # 3)

Negative

Chastain, B. NFPA 664 Enclosureless Dust Collection (EDC) system requirements only allows EDCs that do not exceed 5000 CFM flow rate. The new requirement proposed for the 2013 edition of NFPA 654 specifies "3000 CFM" as the maximum limiting flow rate. There is no substantiation provided for the reduction in flow rate from 5000 CFM contained in NFPA 664 to the 3000 CFM proposed for the 2013 edition of NFPA 654. Aside from this fact, I do not recall this reduction in flow rate discussed or substantiated in our last meeting in New Hampshire. Is this a typo? Nevertheless, I submit a negative for this reason. The correct maximum flow rate allowance is correctly 5000 CFM and is in unison with the requirements of NFPA 664 which is what is intended. A correction is warranted.

Abstain

Stevenson, B. Enclosureless collectors have no place in this document. I am aware of an enclureless dust collector that disappeared in a large flameball and the only reason no person was injured was by dumb luck. All of the elements necessary for a deflagration are present in these devices and they cannot be protected. They can't be vented or suppressed or inerted and they can't be moved outside. Moreover, they are being employed in industries that handle materials that are known self-heaters such as PRB coal. The only reason I am not voting negative is because I do not want to cause the document to be further delayed from promulgation. But I do believe the TC should seriously reconsider this issue with the objective of issuing a TIA if enough support exists.

Affirmative with Comment

Ebadat, V. This proposal suggests language for enclosureless dust collectors. The committee states that based on a report, suitable language was established and lists the requirements. They remove the exclusion that the units can only be used where cellulosic materials and paper are involved and provide a justification for that, however, the language with regard to maximum airflow is changed from 5000 cfm to 3000 cfm without justification. The 5000 cfm requirement is used in NFPA 664 and has proven itself over the years. What justification is used to lower the value to 3000 cfm and if there is none I suggest that the number remain at 5000 cfm.

Febo, Jr., H. Editorially, be sure units are listed English then metric in (g) and (h) as in the rest of the document. Also in (k) provide the metric for 35 ft.

Floyd, L. The maximum flow rate for enclosureless dust dust collectors needs to be consistent between 664 and 654. I would suggest leaving the flow rate limit at 5000 cfm.

654-31 Eligible To Vote:28 Affirmative: 27 Negative: 0 Abstain: 1 Not Returned: 0
7.13.1.2.1 (Log # 30)

Abstain

Stevenson, B. I agree with the submitter's comment, but think the larger issue is whether or not to include enclosureless collectors at all as addressed above.

654-32 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
8.2.1.3 (Log # 4)

654-33 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
9.1.5 (Log # 5)

654-34 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
9.3 (Log # 32)

654-35 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
9.3.1.2 (Log # 8)

654-36 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
9.3.3.1 (Log # 31)

654-37 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
A.3.3.4 (Log # CC1)

Affirmative with Comment

Febo, Jr., H. Editorially, replace "m" with "microns" two places, in the 1st and 7th lines.

Garzia, H. In 1st sentence "420 m" should read "420 microns".

654-38 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
A.4.2.1 (Log # CC7)

654-39 Eligible To Vote:28 Affirmative: 28 Negative: 0 Abstain: 0 Not Returned: 0
A.8.2.3.1 (Log # CC6)

Affirmative with Comment

Febo, Jr., H. Editorially, in the 3rd line, the reference to 8.2.3.2., a requirement for Class II listed equipment for trace dust in an otherwise unclassified area, I believe is incorrect and should be 8.2.3.1.

Taylor, R. A.8.2.3.1 add "washing" as an acceptable method for cleaning. With some products, such as coal, washing is a safer method than sweeping or vacuuming.

654-40 Eligible To Vote:28 Affirmative: 27 Negative: 0 Abstain: 1 Not Returned: 0
Annex D (Log # CC4)

Abstain

Febo, Jr., H. The ballot material has no indication whether this is a total replacement of the material from the ROP (654-96) or just some parts. Why does "D3 Mass Methods A and B" suddenly appear on page 1 of the ROC material between what are paragraphs 3 and 4 of the ROP version? Paragraph D2 appears on page 4 of the draft material and seems to continue into page 9 of the ROC material. Is all this material out of order?

Example 4 still contains 2 references to dust layers under 1/64 inch which the ROC has changed to 'surface color discernible'.

On page 7 there is editorial guidance to move Example 4 somewhere. Does that mean we would now have the material 'The limitations in 6.1.3.2(2).....' and Table D.2.2 and then example 5?

Why was this material not rearranged to represent how it actually should appear? I don't like to assume thus my 'abstain'.