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# Air Quality: The State of Standards

BREHANY, Frank

Independent Consumer Campaigner & Commentator

E-Mail: [FrankBrehany@icloud.com](mailto:FrankBrehany@icloud.com)

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## Abstract

**Purpose:** This work provides an overview, from a Consumer perspective, on how the problem of Cabin Air Quality is being addressed through the development of an International Standard. The author is neither a scientist, engineer nor pilot, but has had to engage with each of those disciplines and determine how a better outcome can be achieved for ordinary airline passengers and for the air that they breathe. The paper concludes on hard-law versus soft-law and the serious issues that need to be addressed, because the issue of contaminated Cabin Air and Standards must surely be at the crossroads?

**Methodology:** The author's extensive experience in the work of Standardisation and dealing with direct Consumer contact, across two continents, has been critically examined to provide an overview and analysis of the current benefits for Consumers.

**Findings:** The issue of contaminated Cabin Air has developed an International "Standards" circus where politics, commercial politics and the possibility of solutions, constantly challenge the challengers. There is a difficulty in a rule-based Standards-making system that fails to adequately deploy methodology and define adequately what constitutes a consensus. This paper highlights those difficulties and raises a number of challenges that if resolved, may deliver a Standard of benefit to an Industry and the occupants of an aircraft. The alternative is a hard-law solution.

**Research Limitations:** This paper is limited to the work, view and opinions of one independent Consumer Campaigner. But, the subject matter is also limited by the scant attention paid by many European Consumer Organisations to this work. Current EU Standardisation Regulation only recognises Consumer "Establishment" Organisations.

**Practical Implications:** This paper has important methodology implications for the future of European Standardisation and the potential for its work on contaminated Cabin Air. It also raises important questions about the state and status of Aviation Regulation in the EU.

**Social Implications:** The commentary in this paper has the potential to alert the EU Consumer Organisation Industry as to the complexity of issues on contaminated Cabin Air, and the process of achieving Consumer protections either through hard-law or soft-law. It also has the potential to raise awareness amongst Consumers globally as to the nature of Cabin Air Quality.

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**Value and Originality:** The originality of this paper is founded in the experience of its author, and its ability to highlight key issues that have the potential to lead to a solution to the long-standing problem of contaminated air within aircraft.

### Keywords

cabin air quality, aircraft, travel, holidays, flight, consumer rights, consumers, air passengers, activism

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## 1 Introduction

My first foray into Cabin Air Quality came in 2006, when I met a group of passengers who had experienced a problem during their flight from the UK down to Florida. A number of passengers were overcome by fumes on their flight and suffered with post-flight problems, not just in their resort, but when they returned to the UK. Some suffered with nerve or concentration problems, others spoke of respiratory issues; a small number suffered with long-term health-problems.

I quickly became engaged with the pilot and flight-attendant community and realised that this had been a major issue over many years, that had affected so many aircrew, and as I was to discover, so many passengers. Whilst science had evaded my own early education, I had to acquire new skills, just to be able to maintain a position in this new conversation; I now know more about the workings of a jet-engine than I do of the engine in my car! I also discovered that within the Consumer representation community, there were few, if any, who were aware of the phenomena of contaminated air in aircraft.

Along with my new colleagues, I explored the route to 'hard-law' (that is a law that obligates a State, an individual or company to carry out a particular act), but I quickly discovered that in the field of Aviation, whilst there may be structural 'hard-laws', the majority of 'obligations' was to be found in the mechanism of 'soft-law', structured through Standards. Such Standards are generally voluntary and not-binding, the knowledge of which was met with incredulity by passengers affected by a fume event, after returning from their holiday in Bulgaria.

I also realised that many of the Standards created were formed in the company of a Regulator and Industry and sometimes with non-aviation 'establishment' bodies; I realised that the wider cohort of aircrew and passengers were notably absent from the conversation. So, I found myself representing passengers in the United States and within Europe, bringing to the table the experiences of real people, the ones who sit at the back of the aircraft, and their obvious need not to enter into an environment that may adversely affect them.

In this paper, I am going to talk about my experiences with Cabin Air Quality and the State of Standards; the State being the principal backer of Standards work and the actual state of Standards.

## 2 So why Standards?

Standards are viewed as consensual solutions to the myriad of engineering and technical issues that can arise on aircraft. Standards are generally seen as a softer option against hard law, in an effort to create a wider compliance and perhaps innovation. They are attractive to legislatures because they potentially take the hard work out of law-making. Standards are generally non-binding and have no legislative force, but they are potentially persuasive on compliance where a complaint or problem arises on an aircraft. The argument made by Campaigners was this: *"If we have no immediate opportunity to create hard obligatory law, then we should as important stakeholders, have a seat at the Standards top table to direct and influence their content"*.

As a result of my work with Consumers, I became engaged in the work of Standards, initially in the United States<sup>1</sup>, along with work in the UK<sup>2</sup> and in Europe<sup>3</sup>.

### 3 The Cultural Divide

The experience in the United States is interesting, this is because I began to recognise the cultural differences that exist between the USA and Europe. This ranges from attitudes toward regulation/deregulation, to how businesses are run and how employees of those businesses engage with workplace issues. It has been vital to understand these differences because they help to inform why positions are taken and the potential route to engagement; it has been a mediation masterclass without the formal training!

To give you an example of some of the difficulties, there are times when I have felt that the Consumer point of view has been drowned out. But then if you are suggesting the introduction of the Precautionary Principle<sup>4</sup> into an American Standard, you'd better be prepared for the almost apoplectic reaction to your proposal.

### 4 The Use of Ground-Based Thresholds

Another example can be found within the debate on ground-based thresholds; their potential use in the aircraft environment provides for an abstract debate. So for example, it has been offered that current thresholds do not deliver consideration of the 'emergency' conditions that arise from a fume event. It has been suggested that the nature of the 'emergency' leads to different considerations, and that current thresholds should reflect such an 'emergency', adopting the levels (which would represent an increase found in the current Standard), in line with the US Department of Energy, Health, Safety & Security's, Protective Action Criteria (PAC) emergency thresholds<sup>5</sup>. If we followed that logic, for example, the Carbon Monoxide (CO) threshold could increase threefold from the current stated levels; is this acceptable? Now I have deliberately chosen CO because I wondered what might be the motivation behind this move? I could be wrong, but the United States may pass/implement a Cabin Air Safety Act (2019)<sup>6</sup> (currently it is passing through the US Congress). Within that Act there is a requirement that would obligate airlines to fit Carbon Monoxide (CO) sensors. I can see the concerns of airlines, worried that CO sensors (with a low threshold limit), could deliver repeated warnings which may affect the viability and operations of that aircraft. It therefore raises the point; would the proposed increase in the CO threshold level within a Standard, ensure that the sensor would not be activated so often; how does that benefit the occupants; do airlines already know how much CO is present on any given flight?

### 5 The European Experience

Remember, standards-making shifts debate away from any 'hard law' requirements and has delivered a global standards-circus, where we criss-cross time zones to deliver documents that hopefully provide value and fairness for all. In Europe, as campaigners, we challenged the orthodoxy of a published Industry standard, as not reflecting the reality of flight nor indeed the participation of a wider stakeholder cohort. That standard was overturned and new work began in 2015 to create a European Standard. In the beginning, it was difficult, with both sides entrenched, but European politics always delivers on engagement and consensus. In 2020, despite the challenges of COVID and over 1,100 Public comments, we produced a draft Standard of value: **CEN prEN 17436**<sup>7,8,9</sup>. The document delivers series of mechanisms

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<sup>1</sup> [https://www.techstreet.com/ashrae/standards/ashrae-161-2018?product\\_id=2001169](https://www.techstreet.com/ashrae/standards/ashrae-161-2018?product_id=2001169)

<sup>2</sup> <https://standardsdevelopment.bsigroup.com/committees/50256465>

<sup>3</sup> <https://www.cencenelec.eu/european-standardization>

<sup>4</sup> <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2000:0001:FIN:EN:PDF>

<sup>5</sup> <https://www.energy.gov/ehss/protective-action-criteria-pac-aegls-erpgs-teels>

<sup>6</sup> <https://www.congress.gov/bill/116th-congress/house-bill/2208>

<sup>7</sup> <https://perma.cc/S7AD-5G7J>

(or a hierarchy of controls) all under the watchful umbrella of the Precautionary Principle. This document does not contain thresholds, because that is what ALL the stakeholders agreed we should do, we also went beyond the pass/fail criteria argument. Our work delivered due care, due diligence, along with consensus from every single sector in this debate. The current draft Standard presents the very best of solutions, where formal European regulation has thus far failed.

Through this process in 2020, we began to see the emergence of a press narrative that demonstrated that some wished to resile from the previous position of consensus. Equally, during the process of the last two years, some external letters were received on cabin air quality. Some of those letters were brought to our attention; some I have subsequently been made aware of. Whilst I could certainly provide extensive commentary on the issues that were raised, I will not do so at this time simply because I wish to respect the fact that they appear to be protected by privacy. But from what I have seen, in my opinion, some contain matters of important public interest warranting at least some form of debate. Currently this is a matter for others to deal with!

Despite these interventions, there was a clear palpable fear from some that this Standard would enter the lexicon of Aviation laws, but given that the many laws they refer to as “regulation” such as CS (Certification Specifications)<sup>10</sup>, AMC’s<sup>11</sup> (Acceptable Means of Compliance), AltMoc’s (Alternative Means of Compliance), are in fact voluntary, non-binding and, have no legislative force, their fear is somewhat redundant. As COVID entered our lives, some wanted to suspend the work.

At the end of 2020, when many expected that the draft Standard would go out for a formal vote, potentially leading to publication, we all experienced an interesting commentary and some surprises on the outcome of our expectations. A decision was made, not by the experts on the Standards Committee, but for and on behalf of the experts, as to what would next happen to the draft Standard and its future direction of travel, leading to yet another Public Enquiry. The arguments I heard to support this action stemmed from some wanting to give those ‘not in the room’ the opportunity to submit their own points of view or, a lack of consensus or, a claim of reliance on the so-called ‘Salon’ case as reasons for not sending the document out to member states for a decision toward publication.

The ‘not in the room’ argument simply fails because aviation manufacturers and airlines have all been actively engaged in the global-standards-circus, they would have to be socially isolated not to have heard and read of the existence of this European Committee; in any event, they had verifiable representation from the early days on this Committee.

A claim for a lack of consensus also fails because the facts speak for themselves; we had come to trust each other and had defined a clear process that delivered for all voices through due diligence.

## 6 The Salon-Case<sup>12</sup> Argument

The Salon argument demonstrated a misunderstanding of this interesting Standards case, which was essentially a dispute between two standards technical committees. One committee claimed that the other’s published standard should not stand because some of its measures needed to be carried out by qualified people. However, in my opinion, the important argument challenged that this published standard failed to protect the health and safety of EU Citizens. The case simply had no analogy to our present circumstances because of the consensual nature of our work and of the extensive debate on safety leading to the universal acceptance of the Precautionary Principle. As we all struggled to deal with this new direction of travel, I also discovered two other important issues.

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<sup>8</sup> <https://eurecca.eu/post/european-aircrew-passengers-welcome-completion-standard-aircraft-cabin-air-quality>

<sup>9</sup> <https://www.eurocockpit.be/news/support-new-standard-cabin-air-quality>

<sup>10</sup> <https://www.easa.europa.eu/faq/19026>

<sup>11</sup> <https://www.easa.europa.eu/document-library/acceptable-means-compliance-amcs-and-alternative-means-compliance-altmocs>

<sup>12</sup> <https://www.top-normy.cz/users/files/procesy-tn/CEN-CENELEC-Refit.pdf> (Search for ‘Salon’)

## 7 Fuel Tank Inerting System

The first related to the Fuel Tank Inerting System<sup>13,14</sup>, delivering a separation of bleed-air gases and compounds, so providing an inert gas for the fuel tanks on aircraft. It caused me to ask, if this separation technology (to remove chemical compounds or harmful gases) already exists, then why had this not been discussed since 2015?

## 8 The James Elliot Case

The second point relates to a case that came before the European Court of Justice in 2017, which declared that mandated/harmonised Standards, attached to European Regulation, should also be considered as law. This decision has already had a profound effect on the European Standards world and I suspect there is some reticence from Companies who had been given up-to-now, free-rein to define their operations. It got me thinking. The Treaties of the EU provide a division of labour and competency for the benefit of the Union and the Single Market. One competency is Aviation. EASA has been given that competency by the EU to make regulation. Therefore, if you follow the logic of this case, the 'standards' attached to formal regulation, those being CS's, AMC's & AltMoC's, must therefore be logically mandated and harmonised, and should surely now be classed as formal law, with all their apparent imperfections?

In my opinion, it presents an opportunity for Trade Unions and Consumer Organisations across Europe, who should begin the conversation and challenge the status of European Aviation Standards, utilising the arguments and logic of this case (*James Elliot Construction - Aggregate - Could the court adjudicate on a harmonised standard?*<sup>15</sup>). Would this not create a sense of purpose and legal certainty; what about benefit to pilots and cabin-crew and ultimately the passengers?

## 9 Pressure Points

In conclusion, we are now faced with a number of pressure points:

1. Recognising the extensive risks that exist in standards-making against the risks faced by the occupants of aircraft (Vested Interests/application of rules);
2. In Europe, finding a way to restore consensus, trust and once again determining ethical intentions;
3. As we subscribe to standards-making rules and ethics, how we can ensure that the work guarantees process, enforcement, oversight, courage or stability?
4. Will we once again have to respond to the desire for a performance-based or thresholds Standard?
5. Should we claim a necessary & properly formed methodology, clear & open analysis and a recognition of a wider European Union process?
6. Will this work lead to arguments without end when all thought that such arguments had been resolved by consensus?
7. From a personal perspective, if a process produces difficulties that could ultimately deliver detriment to Consumers, is it right to continue to legitimise that process?

These are difficult questions but they are now accompanied by the need to carry out a continual risk assessment of any standards-making process; it is no longer an option not to risk assess this work.

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<sup>13</sup> [https://www.faa.gov/regulations\\_policies/rulemaking/committees/documents/media/ECfthwgT1-1231998.pdf](https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/ECfthwgT1-1231998.pdf)

<sup>14</sup> <https://www.collinsaerospace.com/what-we-do/Business-Aviation/Power-Controls-Actuation/Actuation/Composites/Fuel-Systems/Fuel-Tank-Inerting-Systems>

<sup>15</sup> <http://curia.europa.eu/juris/liste.jsf?language=en&num=C-613/14>

## 10 Conclusion

Looking forward, I think there are several immediate challenges ahead:

1. The challenge of the appropriateness of ground-based thresholds against the failure to properly define the uniqueness of the aircraft environment; there needs to be a hierarchy of argument;
2. EU Aviation law/standards provides a presumption of compliance, which is a flawed regulatory concept, because it imports the 'benefit of the doubt' argument, resoundly rejected by the Precautionary Principle - is this the ultimate direction for this Standard? And finally;
3. We as Campaigners have in my opinion taken our eyes off the 'regulatory' ball, and I hope others will join me in creating a formal European Regulation on Cabin Air Quality.

In my opinion, the State of Standards is now at a crossroads, what we do next is important for all.

### About the Author

**Frank Brehany.** I am a dual-Citizen, one of which delivers a long-standing European Citizenship. I am a medically retired Police-Officer and qualified in 1997 as a practising Solicitor, working initially in formal legal practice, this led to ownership and management of a National Consumers Organisation. My interests in Law covers not just Consumer Law, but also the problems found within Consumer Contracts, European Law, Human Rights and National and cross-border solutions to Consumer problems. I have extensive media experience, and comment on Legal issues for Consumers, Travel Trends and the Travel related problems experienced by Consumers.

I continue as a self-funded practising solicitor, not currently working in Legal Practice, but I maintain my competency as required by the Solicitors Regulatory Authority of England and Wales.

I apply my legal training and experience, to help develop solutions within the Standards-making and Political environments. I have never been a member of any political party or grouping and I voluntarily subscribe to the Nolan Principles for Standards in Public Life.

My legal work has always been about the day-to-day Consumer or Victim-related issues, but now I work in arguing both practically and politically for change on Cabin Air Quality. I have now published a book for Consumers to raise awareness of this issue: "Gaspers: Clean Air for Passengers?"<sup>16</sup>

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<sup>16</sup> <https://www.amazon.com/dp/B09B1L1PTS>