I See Something….
....I Say Something....
…..It is my duty*

Dissident Oxygen

and

Other Oxidant

Fire and Explosion Safety
(DOOOFES)

Barry L. Werley

Public Domain Judgments and Verdicts 2026
Public Service Commentary
Circulation/Distribution/Adoption is approved.

***Mike Pence had his duty, I have mine.**

This publication is meant to finalize, archive, and place in the public domain materials that were voluntary efforts during the author's retirement and as such were nonprofit, public-service opinion for use as is and at-your-own-risk. Many of these materials are formatted to allow on-demand printing and publication that can incur some expense. The electronic PDF or any printouts can be distributed freely unaltered.

As public domain opinion, expected to outlive the author, there is no publisher location to site or contact.

Hard Copy Publication

This publication should be and would be available as an Amazon or other sources as a hard copy purchase. It is not at present. However, at last check, Amazon allows only very old public domain books to be offered, not recent public domain commentaries like this. It could be offered as a commercial product but the writer is not interested in starting a company and registering with the IRS and all the hassle in order to do that.

As a public domain document, anyone is invited to commercially offer it on Amazon or elsewhere and added forewords and annotations are allowed. Note also that pdf files can be imported into MSWord to allow such annotations.

I See, I Say, My Duty

The basis of the pronouncement: "When you see something, say something" resides in the first amendment to the Constitution and the need for the *real people in charge:* "We the people", to participate. These days neither of the two political parties listens to we the people and rather works to subvert our republican democracy to their own whims. An analogy can be drawn to the evolution of ASTM Committee G4 on Compatibility and Sensitivity of Material In Oxygen-enriched Atmospheres.

This writer under his authority as a citizen has concluded that government, and Committee G4 suffer from bad code and need reprogramming.

Crucial decisions, rulings, verdicts like these should not be undertaken lightly nor capriciously.... Nor have these been. As a result, some entries herein are painfully detailed and droningly elaborated and too-often repeated to a fault, often accentuated with angry b-a-a-a-d words. My apologies, but better too much than too little.

Barry L. Werley

Table of Contents

--Section 5--Absent Standards I Dissent To-- 65

--Section 6--Standards Adoption I Dissent To-- 69

--Section 7--References-- 72

--Section 8-- Appendix--75

Section 1 — Introduction

“Let there be light…”

Unwanted fires and explosions in oxygen and other oxidants have occurred, all were important, some had dire consequences (for recent example: 2019s Sanmenxia explosion [15-24 fatalities]). A number of tactics have been developed in an effort to prevent them or reduce their frequency and damage. Many of these tactics are cited in the voluntary defined–consensus standards of *ASTM Committee G4 on Compatibility and Sensitivity of Materials in Oxygen-Enriched Atmospheres*.

I have worked with ASTM Committee G4 since its inception in 1975. Over the last two-plus decades, I have taken exception (dissented typically in vain) to a number of altered administrative practices, aspects of, or material in, or not included in, about eight of its twenty-four standards, and I encourage five new standards. G4’s dominant leaders (referred to variously herein as the NASA+ cognoscente, and “bullies”) have shunned almost all of it. This apparently is but wasn’t always their right to do, but which therefore withholds these materials (right or wrong, good or bad) from those at risk contrary to the G4 mission statement. Those responsible for dealing with the oxidant hazard may wish to consider these withheld alt-safety materials, or not, as is also their right to do. Sadly, this trend away from collegiality and public service and towards authoritarianism and perhaps a form of planned obsolescence is manifest in numerous places, laws, and regulations (see the egregious example in the appendix). This therefore questions the motivations of G4 as well as the competence.

And so, 25+ years of cordial deferential dissent is enough. There comes a time for pushback on the playground. A time to metaphorically punch the bullies noses. For indeed, this commentator is currently a number of years beyond his life expectancy at birth. Cordiality has been stretched beyond decent levels and is simply not possible forever. Indeed, this situation pushes cordiality far beyond what this commentator had any duty to observe.

Hence, this dissent is a legacy effort to archive my portfolio of current dissident opinions and gripes which like G4’s standards are also voluntary materials (VMs), alternative perspectives the merit of which is open to argument. They may be correct or flawed and may also be used to evaluate ASTM, G4 and its dominant leadership, and G4's products and to also be factored into oxidant system designs, material selections, and incident investigation procedures to supplement or even

replace specific G4 voluntary standards or other standards. These VMs are “as is” and “use at your own risk” and may be deemed valid or invalid and may be adopted or rejected for specific purposes by any voluntary user who bears responsibility for the safety of oxidant systems. These VMs remain available for adoption by G4, or others, should G4 come to its senses and align with the better angels. The guiding goal should always be how to achieve fewer injuries and deaths, less property damage, fewer shutdowns, while efficacy, value and options remain personal choices. Failure ***is*** an option but a potentially very costly option in both dollars and lives.

This Website has no formal connection to ASTM, or Committee G4, other than that, as noted, the author has been a charter G4 Member and contributor who is now disenchanted. This material, some critical of G4 (and in some cases *very* critical of specific members), is not just sour grapes. I agree with and endorse wide swaths of the G4 BOW-WOW (its Body of Work and Waiver of Work) over the years, and as noted above participated in creating much of it, but this is not trivial dissent either and I now distrust it. I believe and bear witness to G4 wandering too far from its original existential mission to that mission's detriment, being unduly influenced, consciously obsolete or inadequate and it is welcome and again encouraged to reconsider any or all of the public domain material presented and incorporate any amount into their body of work or to reject it all. To repeat, fewer injuries and deaths, less property damage and fewer shutdowns should be the goal.

I also repeat that these materials included are “As Is”, “Use at Your Own Risk” opinion and like any similar printed archive are a locked-in historical snapshot of the present time. They are all donated to the U.S. public domain record. Numerous additional PDF files are also public domain and available in this dissent that launched on the Web but can be operated as a standalone also with this dossier embedded into it. But, again, these materials may also be rejected or ignored. The web site may become unavailable at any time for various reasons and so can go "out of print" at any time, but hopefully will be available on-line for a few years but can be downloaded for permanent use.

I am 80+ and, as previously noted, several years past my life expectancy at birth and my life insurance premiums have suggested I may have as little as a one-in-two probability of outliving this Web Site. So I foresee no merit in further futile attempts to work within the current ASTM/G4 system. Been there done that for the last 25 years to no avail. Quality-process ethics that defer (and have deferred so often in the past) to the current NASA+ dominated leadership makes further unwelcome contributions counterproductive. Enough have been shunned and censored often by “falling through the unfortunate cracks”. An exclusionary message has been received over and again. Further opinion, analysis, software utilities, and perhaps even testing are possible and may be needed. Hence, revisions and later editions may obtain but should not be expected. This documents historical opinion and no longer seeks dialog. I am also not seeking to consult, expert witness or oth-

erwise do commerce, but to fulfill what I see as my duty and prerogative. I consider oxidant safety a form of calling.

I recuse myself from further collegiality (including effort to provide disparate opinions). Like all of G4's standards these materials are glorified by those who agree with them (namely me but maybe not just me, we'll see), because they may be freely considered or ignored, and like G4's standards may not always prove beneficial. That is a great conundrum of the oxidant safety quest. Oxidant safety is not fully settled science, there are still some things to learn and much to do. Users of these opinions, as is also the case for G4 opinions or other opinions, can and are obliged to chose what tools they need from what's currently available. Anyone may feel free to also dissent to this dissent, perhaps set up a dissent web site of their very own.

Finally, these opinions are based upon decades of industrial experience while employed, interactions with cognoscenti: experts throughout industry, academia, and others and are dated and may not reflect the present views of those prior affiliations and interactions.

Barry L. Werley

BLANK PAGE

Section 2

Background and History

Voir Dire

This commentator, does not pretend to know it all but does have quite a bit of training and experience and has seen and done a lot. My experience is wide in industry and within G4, *it is unsurpassed*. My lab work has apparently held up better than some to be reviewed herein. My education is respectable and applicable (though not extreme) and I submit that qualifies me to comment. A more detailed voir dire is found in an earlier writing [***1***][1].

Dereliction of Duty

In 1943 (the year I was born) General George Patton lost his patience with a shell-shocked soldier (or two) and slapped him (or them). Forced to apologize he argued according to the movie “Patton”, (which I paraphrase) that his sole purpose was to try and restore in that soldier some appreciation of his obligation as a self-respecting soldier. It is my judgment that ASTM and its Committee G4 are derelict in their duty and need some similar friendly motivation. Years, nay decades, of cooperation and collaboration and collegiality have been futile. Perhaps this dissent can help. The bases for this judgment are provided throughout this dissent along with many helpful suggestions hoping to similarly restore meaningful self-respect in these entities.

Things Go "BOOM".

Two kinds of fire and two kinds of explosions are of special interest. Fires can be slow or fast (as in deflagrations and detonations) and they can yield explosions that are purely physical (as in a bursting balloon) or that produce very destructive shock waves (as in the 1995 Oklahoma-City-protest fertilizer bomb). They can damage hardware and shut down production and worst of all scatter gruesome injured survivors and bodies.

The Non-Fire-and-Explosion Hazard.

Fires and explosions often lead to the additional hazard of disruptive and expensive lawsuits. Lawsuits are best avoided and exhibit their own kind of incendiary-

[1] Italic numbers in refer to the reference list at the end.

like damage. They also add a strong economic incentive to prevent fires and explosions.

The Antitrust Exemption.

Industry and its customers experience all of the preceding fire events and still other kinds and it has happened often enough that industry employs the antitrust exemption to cooperate on matters of public interest such as oxidant safety. This is how standardized headlights for cars came about (so they could be rapidly and economically replaced when they fail) but, of course, the venerable sealed beams of olden days have now become history. This is why the Compressed Gas Association (CGA) standardizes things like compressed gas cylinder fittings so that customers can use anybody's cylinders with their systems and avoid connecting the wrong gas that might produce dire consequences. And that is why CGA has developed things like its original Pamphlet G-4.4 [***2***] to reduce oxygen pipeline fires.

Safety is a two edged sword. In the 1960s and perhaps before, the legal theory of strict liability was emerging, personal injury lawsuits were becoming more numerous and more daunting. By the early 1970s after several high profile accidents occurred: The Dortmund Oxygen Plant explosion [***3***] with 14 fatalities and the Apollo one fire (1966) with three fatalities stood out among a series of lesser accidents. After the Apollo One fire, NASA sought to learn how industry addresses this hazard. Paul Ordin of NASA-Lewis in Cleveland (now NASA-Glenn) issued contracts to several U.S. companies to document their practices in confidential reports. Later some but not all of those reports were made public. At that time, every company had its own procedures and typically each had their own custom specifications for oxygen equipment much of which cost a substantial premium to buy.

My Boss-to-be (1972), Dr. Abraham Lapin authored one of those reports [***4***], and he and his boss Dr. Clyde McKinley took the opportunity to not only document corporate practices but reorganize and improve corporate procedures and launch a new more systematic method of controlling these risks within the company. New centralized Corporate testing methods were launched and Lapin developed and documented his new Acceptability Index approach to weighting the various properties of materials [***5***]. Lapin also launched and led a new effort to share and develop industry-wide safety practices world-wide under the antitrust exemption.

With exceptions, oxygen and other oxidant (OOO) safety practices were not treated as trade or patent secrets. Information was often shared but not coordinated. That would soon change.

McKinley and Lapin realized that if standards, or even just a common demand, for oxygen equipment and practices could be agreed upon oxygen system costs and safety might improve, incidents, injuries, damage and, yes, lawsuits would decrease, and *everyone* would benefit. It was genuine public-interest win-win stuff.

Oxygen Safety "Wisdom"

Google says wisdom is: "The body of knowledge and principles that develops within a specified society or period." Public sharing of oxygen fire safety thinking has led to a body of knowledge and principles within the oxygen producer and large-scale user community that can be considered wisdom, however, agreement is not 100% in every case, nor is the knowledge complete and so those who face the oxygen fire hazard still need to appraise the wisdom that is available and promoted (which today is still not a full consensus wisdom) relative to their own unique circumstances.

Here Comes ASTM G4

Lapin became itinerant, oxygen safety's Johnnie Appleseed traveling the world seeking allies and making his case. He was joined by three supporters in industry Andre Bassou (L'Aire Liquide), Jack Gilbertson (BOC) and Robert Neary (Union Carbide – Linde, later Linde/Praxair, now Praxair Linde AG). Neary's own recollection of these proceedings is the keynote address for G4's first symposium [***6***]). Numerous standards organizations declined to accept a new committee but The American Society for Testing and Materials (ASTM) welcomed the addition that would become its *Committee G4 On Compatibility and Sensitivity of Materials in Oxygen-Enriched Atmospheres* in 1975. This worker was there.

ASTM was quite a good fit. In 1975 ASTM was vocal about its voluntary full-consensus mission. New Committee G4's standards were voluntary. Anyone could use them or reject them. They were not the only or in every case the best solutions. They were opinions, even "suggestions", glorified by those who agreed with them. They would not be codes or other mandatory material. The vast majority of oxygen systems in the world were and would be for a long time legacy systems not capable of revolutionary new safety dictates. The industry safety record was not bad anyhow. It just needed to be better. The benefits of its products far outweighed the risk of their production. Yes, there were occasional incidents some rather bad, individually, but working with or using oxygen was not extreme hazardous duty by any means (things might be worse today). Indeed, one of the central and most important bases for using an oxygen system design was if it had demonstrated a significant history of safe use. The reputation and track-records of the advocates helped users decide whether and to what degree to use these opinions. But G4's opinions did not invalidate other opinions (including historical decisions that underpin all of the existing world's oxygen systems). They were friendly commentary intended to help and encourage and tutor users about options to make their own best safety decisions.

Just weeks before its first meeting Dr. Lapin fell severely ill and his coworker Corporate Safety Director Leonard Ball replaced him as the first Chair. For three years I had done fire testing and had operated a fire and explosion test laboratory under Dr. Lapin and was destined to be a charter member. G4 launched with good

representation from industry, government including the Air force and NASA (Paul Ordin among others). Most members were rather lofty management types. Hands-on lower-level lab workers like myself were few. And very few of them had discretionary time to do voluntary leg work for the new Committee. When I signed on (finally got a job) in the 1972 U.S. recession that was actually a technical-worker depression, it was as a technician then later became an exempt employee in 1974. I was a three year low-ranking employee with a brand new title of Hazards Research Specialist (probably the only one in the corporation for more than a decade or two) and at that moment was reporting to Dr. McKinley who as our companies first Director of Research had been reporting to the founder, president, and chairman of the board of a Fortune 250 Corporation. Within that year the founder would die and in coming years Dr. McKinley and I both gained numerous new layers of management above us.

The assignment he gave to me was simply: Help G4 succeed. If that meant emptying the waste baskets then empty them, and sometimes mundane tasks were indeed G4's greatest obstacles. But recall most of G4's members were not worker bees (most were at least managers, even some company owners) yet they all did want to move forward. In G4's early years, assignments could be handed out but they seldom got done. Typically what got done was what anyone chose to do for their own reasons. After all, they were all volunteers. Volunteers always have the final say.

In the early years, none of G4's assignments were prestigious. They were working assignments and I found my self moving through nearly all of G4's offices often by default. When there were no other volunteers, I was there as the designated default volunteer for all jobs and not just emptying waste baskets: committee secretaries, and chairs, full committee vice chair and chair (1982), first symposium chair and technical editor, draft standards author, Second Education Committee chair, but also software coder, newsletter editor and reporter. I tracked what G4 needed and how it all fit together, and whatever it needed became a priority for me. In some instances I had entire learning curves to climb.

The first standard G4 produced (several early adoptions were from outside the Committee), was Standard G63. It took five years to develop and did not draw rave reviews. It became apparent by the time I became the Full Committee chair (1982), that evolution, sometimes circular evolution (some might say circle-jerk), was a major problem. Changing minds, wandering memories and new personnel were constantly changing and changing-back proposed text often for cosmetic, often editorial rather than technical reasons. This demon was vanquished after several years but appears (in 2025) to have returned with a vengeance.

I led adoption of the concept of fast-track standards development when I realized standards are a "snap-shot" in time (a lesson that seems to have been corporate-forgotten). In standards battle one needed to assemble all the troops, identify what they agreed upon and then before they changed their minds or were changed (replaced) themselves, conducted simultaneous ballots at all levels. In this process I often drafted the first version of many standards (G88, G145, G94, G114, G125, etc.) and major revisions/expansions (G93, G63, G128, G88). In each I prepared my best-

guess draft of what I had heard discussed at meetings, what I knew, and what individual key personalities said, and (in either order) sought comments from the full attendance at a meeting then from the full Committee in a mailing, negotiated changes person-to-person then balloted new standards at both subcommittee and full committee levels in some cases producing new standards in as little as six months. For example G88, which became one of the most popular standards was proposed at one meeting in 1984 and its adoption was announced at the next meeting, and it served without issue for twenty years. G4's original education textbook took only a little longer.

Today G4 has achieved substantial success and some of its offices are coveted. And sadly unseemly politics has emerged. Untoward motivations are not as carefully disguised as had once been the case. I might not qualify to hold any of its offices today. Sadly, today, G4 seems to be chewing its cud a lot more, but grazing a lot less and (without suggesting either that there is a great amount left to do or that everything is done) adding very little to its cud. Furthermore G4 is the only game in town. While there are non-public industry groups that address oxidant safety, there is no alternative voluntary group out there to compete with. Hence, G4 is the only game in town, ...and in this opinion it has run astray.

The G4 Success Story

So after about fifty years, G4 has produced or adopted about 25 standards as indicated on Figure 1. Some have been converted from original purpose and some may have been dropped. The vast majority of this work was in the first half of G4's tenure. In this opinion, during the second half, the character of G4 underwent critical changes first due to changes in its membership and leadership, but the last two decades may have produced as few as one new (albeit leftover) standard, In fact in early 2000, G4 went through a severe additional retrenchment due to a string of societal disruptions (9/11, the housing bubble, the Iraq war) and G4 made a conscious series of decisions to near-hibernate: to focus for a period on only four core functions: standards maintenance, its training course, its symposia and seminar series, and specific ongoing industry-sponsored research efforts.

Through these difficult times and beyond, the Committee maintained operations and sustained its portfolio of standards. Its training course was held with more than a thousand students and perhaps today several times that amount, the series of symposia increased from ten to sixteen. However industry-sponsored research efforts have been apparently inactive for more than a decade.

Unfortunately, and perhaps tragically during the same period many G4 activities were curtailed. Its Newsletter was scrapped, indeed minutes of meetings seldom issued and G4 fell into a "Black Hole". Numerous opportunities to launch new efforts were simply declined, and several support efforts soon stopped. And during the period the cognoscente (in the writer's opinion) drew into itself and operated often as oxygen safety czars, a star chamber, more so than consensus builders. The character of the symposium proceedings changed shifting to a more academic "POP" (publish or per-

List of ASTM G4 Oxidant Safety Standards

- **G128 Guide to Control of Hazards and Risks in Oxygen–Enriched Systems (G4's Abstract Standard)**
  - **G88 Designing Systems for Oxygen Service**
    - **G175** Evaluating the Ignition Sensitivity and Fault Tolerance of Oxygen Regulators
  - **G63 Evaluating Nonmetallic Materials**
    - **D2512** Compatibility of Materials With Liquid Oxygen (Mechanical Impact)
    - **D2863** Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion (Oxygen Index)
    - **D4809** Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method)
    - **G72** Autogenous Ignition Temperature of Liquids and Solids in High-Pressure Oxygen Enriched Atmospheres
    - **G74** Ignition Sensitivity of Materials to Gaseous Fluid Impact
    - **G86** Determining Ignition Sensitivity of Materials to Mechanical Impact in Pressurized Oxygen Environments
    - **G114** Aging Oxygen–Service Materials Prior to Flammability Testing
    - **G125** Measuring Liquid and Solid Material Fire Limits in Gaseous Oxidant
  - **G94 Guide to Evaluating Metals for Oxygen Service**
    - **G124** Determining the Combustion Behavior of Metallic Materials in Oxygen Enriched Atmospheres
  - **G93 Cleaning Methods for Material and Equipment**
    - G120 Determination of Soluble Residual Contamination in Materials and Components by Soxhlet Extraction
    - G136 Determination of Soluble Residual Contaminants in Materials by Ultrasonic Extraction
    - G144 Determination of Residual Contamination of Materials and Components by Total Carbon Analysis Using a High Temperature Combustion Analyzer
    - G127 Guide to the Selection of Cleaning Agents for Oxygen Systems
      - G122 Test Method for Evaluating the Effectiveness of Cleaning Agents
      - G121 Preparation of Contaminated Test Coupons for the Evaluation of Cleaning Agents
    - G131 Cleaning of Materials and Components by Ultrasonic Techniques
  - **G145 Studying Fire Incidents in Oxygen Systems**
  - **G126 Terminology Related to the Compatibility and Sensitivity of Materials in Oxygen-Enriched Atmospheres**

Desirable New Standards

- **GXX1 Guide to Control of Hazards and Risks in Oxidants Other than Oxygen (*Delinquent* sub-abstract standard)**
- **GXX2 Guide to the Application of Thermo-Chemical Equilibrium Data**
- **GXX3 Guide to G4 Software Adjuncts (Delinquent)**
- **GXX3 Guide to the Effects of Aging on Materials in Oxygen Service**
- **Guide for Large-Scale Use of Polymer, Pipe, Tube, and Components in Oxygen service**

FIG. 1—*Interrelationships of ASTM G04 Standard Guides and Practices and Their Supporting Test Methods*

ish) style. Membership fell by nearly half and today is worse than its smaller numbers indicate. Over time many of these issues would come to be lamented and some efforts would be directed to remedy but as of 2026 this assessment is that there is just not enough energy to operate the way G4 is trying to operate effectively, which contributes to this dissent. Nonetheless the street-gang-like self-appointed-czars posture appears to sustain.

The Mythic Voluntary "Full-Consensus" Standard.

My recollection, however flawed it may be, is that in 1975 ASTM focused proudly and loudly on "voluntary **full-consensus** standards" and that seemed to be the case. Full consensus meant largely "without dissent" and with "unanimity" in both the dictionary definition and within G4.

Back then, ASTM was a harsh task-master. It seemed at times that if you used a word in a standard multiple times and misspelled it once you could not correct the spelling without a re-ballot. That is perhaps exaggerated, but it seemed that way. However beginning in the 1980s G4 held several of its rare meetings in an ASTM Committee week to please ASTM. Solitary meetings were labor intensive and costly. In March 1990, ASTM seeking to illustrate the benefit, the lure, of meeting in its large "Committee-weeks" (including 'free' coffee breaks) trotted into the meeting a new Chairman of the Board to welcome us.

He was not prepared for the reception nor the mauling he received led by Robert Lowrie and Joel Stoltzfus. And other committees must have felt the same for in the 1990s Corporate ASTM restructured major new procedures. Some parts of them went so far that I rue them. For one, they made snapshot standards and other things more difficult. And today they stress voluntary consensus standards (not ***full*** consensus), and the consensuses that support ASTM Standards today are in some cases far different from the full, or at least greater unanimity of older times. In this judgment, things have swung way too far in the other bureaucratic direction and that is problematic. That is bad.

For example our original Staff Manager, Jack Bystrom, was a memorable flamboyant ASTM veteran who often regaled us with these impressive impromptu spot-on dissertations, including my favorite on how ASTM was located in Pennsylvania because of the state's original Constitution that granted great liability immunity to standards groups whose standards were approved with a *full* consensus. How can you condemn anyone for doing what *everyone* agrees (even if tacitly) they *should* be doing? Keep in mind ASTM was chartered in 1902 and Pennsylvania's constitution was dated 1873. Even before the modern litigious society became manifest, there was apparently benefit to being a full-consensus standards organization. I have often heard this referred to as a "loneliness philosophy". If everyone is doing some routine task one way, then you need a reason, a damn good reason to be an outlier. Outliers are more vulnerable when things go wrong, and I have wit-

nessed proof of this Gospel more than once.

Avoiding controversy was a prime objective back then. Anyone, even in the general public could raise an issue and ASTM Committees were required to deal with it the same as if it has been registered as a negative ballot by the Committee's most prestigious member. A potential synonym for this "full-consensus" factor is to say "everyone agrees" even if the agreement was about what they disagreed about. Back then, we put enormous effort into avoiding negative ballots. I can recall only a very few cases of finding a negative ballot non-persuasive and can recite examples of the lengths we, and I personally, went to in order to achieve affirmative votes. Today, despite the onus and risk of strict liability, ASTM now allows wide ranging latitude to in effect disregard (and as I shall argue: cover-up) dissent, ...and G4 has become quite bureaucratic and very political in doing so. I have had negative ballots found not-persuasive for non-technical (actually in my judgment lame) reasons that were not merely specious but at times mocking. Withdrawal of negatives based on promises for redress in immediate revisions that "fell through the cracks" perhaps for lack of energy but perhaps for politics. The G4 consensus these days has been achieved with at few as ten votes out of a 100+ member committee (the other 90 or so members having tacitly "delegated" authority) using a clever procedure (based at least in part on a "proxy" imprimatur). And this has *not* violated current ASTM parent requirements. In this judgment, this new bureaucratic liberty is "cruisin for a courthouse bruisin". More on this later.

Bipolar Disorder and Codes

There are two ways to look at ASTM (and at some other) Standards groups and they compare nicely with many corporate structures. My entire oxidant safety career was in what is called a *Staff* function. Staff offers voluntary advice. The folks I worked with proposed but it was the *Line* folks who disposed. Line positions were more like dictatorships (that compare to code standards). More like commander/ soldier.

Staff functions advised but the advice did not have to be taken. Hence we offered our opinions but often added tutorial and other persuasion efforts to help the various Lines make their decisions. There was a human tendency to drift into a command mode that I perceive afflicts ASTM G4 to this day. ASTM G4 was chartered so that its products were staff-based as was its Committee Operations. Hence its early *voluntary full consensus* orientation. One can voluntarily accept G4 perspectives but is free to go their own way (because there often were and still are other valid strategies that could be followed), keeping in mind that going one's own way can involve "loneliness" and usually increases economic demands. Hence G4's real job is, in this humble opinion, to tutor and perhaps persuade users, ...to court them ...not to dictate. These days I get the feeling that the cognoscenti in ASTM G4 often feels they have intellectual supremacy that demands that their edicts from Mt Olympus compels the use of G4's standards. It does not. It should not. I have even heard recent advocacy for the production of severely ill-advised "compliance standards".

By definition, those who use ASTM G4 standards, are receiving them as Staff input. They must decide for themselves whether to adopt the materials. Whether they find them, all or in part, persuasive. If they have reason in any case, and there can be and are many reasons, not to employ G4's opinions, or to modify them, they are free to do so but they are then more lonely. And that is okay if they got the safety situation in hand. It would be more than tragedy for anyone to be injured or die because a G4 standard was obeyed when a known safer, better, alternative existed.

Line organizations are allowed to issue any order they wish to their departments including whether to comply with ASTM G4 Standards. ASTM does not oppose allowing its standards to be used as line materials. Indeed in some fields, standards are encouraged as line materials, that is to say as codes[2], and Committees with jurisdiction can suggest standards they feel are prepared to that high degree of care and validity. And similarly in some cases use of G4 standards as codes has been overtly discouraged where the Committees believed their standards had not been prepared to that degree of perfection. G4 has had dissent to this posture. Ulrich Koch, a major and talented G4 contributor (principal author of standard G 128 for example) was a strong advocate of listing G4 standards for use as codes (read his 1997 Keynote address in STP 1319 [***7***]), but his cause did not prevail and for good reason in this opinion.

Nonetheless. in some cases human nature displays similar bipolarity in the operation of Committees themselves. In some cases the collegiality implied in a full consensus standard reflects thorough transparency in how a Committee operates. In how its leadership seeks full participation. Similarly in some cases a line-type Committee management obtains in which a cognoscente seeks to operate much like oxygen safety czars (bureaucrats). The Committee becomes opaque. And every now and then the inner sanctum releases something, often urgent, for the Committee to vote on (to rubber-stamp). If the latter sounds like national politics these days, it is. Generation one of G4 was largely a Staff operation. However generation two and later has clearly been shifting more to a line type of operation despite the problems that entails when comprised of volunteers. I fear elements within G4 have been seeking to de facto operate as a line organization and to have its standards viewed and obeyed as de facto codes.

Dissent is much more likely to form in Committees with a more line-like operation and such is a major though not only factor in this dissent. Indeed even on the largest scale, the United States itself, in this humble opinion has been shifting from a staff (republic format) to a much more nearly "strong leader" (dictatorship) over the many decades of my lifespan and before. It seems this is human nature. Some of us really want to be alpha wolves. Many, but not all, maybe most of us are

[2] Two of the most famous codes are the National Electric Code and the Building Codes both of which are often adopted into laws. After participating with G4 for about fifty years, engaging on occasion with similar committees the writer has become rather concerned about the possible abuse of these codes and powers by their respective cognoscenti.

willing to be betas.

Regardless of how G4 operates behind closed doors, its success depends on whether its standards are voluntarily used or ignored. This implies an inherent need to focus on its users and what its users want and need and not so much on what its members (or even just its core cognoscente) want. Although it charges for its materials, G4 is not “selling” its products but needs to promote respect for them in the spirit of the 1980s quality-process ethics: like “continuous conformance to customer expectations”.

The Role of Dissent/Collegiality

Dissent can serve a useful purpose even when disruptive, though these days disruption is often viewed as a good thing when it supports the insurgent. The specific dissent may vary depending on whose opinion is being considered. In the dissent to be addressed here, G4 is not alleged to be broken but its operating algorithm has some bad code in it. That can be looked at as sour grapes from a old-timer member whose fall from grace was perhaps because time had passed him by and he is now obsolete and doddering, but it may just be because G4 has changed over the two-plus decades that he has been submitting materials that have been pretty completely rejected (shunned in other words). Dissent helps users to decide this for themselves. And so they shall.

Nonetheless, dissent is damaging to a voluntary full– or defined-consensus standard, and that is one of the reasons why this dissent has been deferred for so long. Not only does its mere existence prove the opinion in the standard is *not* what *everyone* agrees should be done, it proves the exact opposite. When incident investigations are being conducted, and especially when they are foundering, dissent to the base standards takes on a new credibility. And in this judgment G4 is severely vulnerable in this regard.

So why do a formal dissent? Who needs a formal dissent? Why not just work in a nice collegial manner within the G4? Ideally that would be preferable and has been the writer’s goal for two+ decades. Hence the decision to do a formal dissent now can not be called rash. However at best current G4 cognoscente may find my efforts unsuited to its goals. At worst my pariah may have resulted from my comments about the emperor's new clothes. The basis for that may include personal animosity for I have stepped on toes, but it may signal a more native [Line rather than Staff] reception. Every effort of mine has been graciously received and then completely ignored or scrapped outright, rejected when it could not be ignored, as they should have been if they are crap, and YOU the reader get to decide if they were. And if not, then it was wrongful to disdain any merit in them. You the user also get to make that choice. You and your worker’s and your customer’s safety is at risk. This dissent, like the G4 body of work (BOW) are opinions that you on the front line are welcome to adopt, adapt, or reject.

For this G4 needs to not only take dissent more seriously and as will be discussed later should add a dissent section to each of its standards. So should every ASTM standard, all thousands of them.

Known Unknowns

We know there are things we still don't know. We know we don't know the causes of a significant number of fire and explosion incidents that have happened going back as much as at least fifty years, probably back to when Priestly discovered oxygen. We also know that some of the things we thought we knew were wrong. We have seen how incidents have happened. How following those kinds of events, there have been times when the smartest guys in the room have assembled, done an investigation, and failed to find a cause (I call these nightmare incidents), or worse declared a cause and implemented a fix only to have the event repeat, ...more than once (I call these cluster incidents) [***8***]. Oxygen and other oxidant fire and explosion safety is NOT settled science, it is not complete. On 19 July 2019 there was yet another large scale (possibly top-ten) reminder of this verity in Sanmenxia China (as really graphic video links[2] exhibit). As a result, many of us are limited to opinions about those things we think we know but there are those of us with much higher levels of arrogance who can seek to dictate absolute truths, hence even those who follow G4 opinions to the letter are not fully immune to even severe fire and explosion incidents. G4 can make a strong case that its opinions will reduce (and in fact *HAVE reduced*) the number of events, but cannot claim to have eradicated every last one. We still have things to learn.

Terms and Conditions

This worker is comfortable being a "staff" commentator" providing non-mandatory material here to those whose shoulder's bear the burden of decision. The materials herein are offered as conscientious opinion and cite resources to aid in their verification. However, that does not and can not elevate these materials above the standard of opinion. They are like many ASTM standards voluntary and sadly have a consensus of only one (or perhaps a few) since they have been shunned from the G4 operations. Keep that in mind. This is not the Oracle at Delphi speaking. It is not Zeus from Olympus. It is merely opinion, hard-won opinion, anyone is welcome to evaluate and adopt or reject *just like they can, indeed must, do with every standard G4 has ever published*. But you are entitled to know about them, so you can do *YOUR* thing and discharge your duty.

So How Stands Oxygen Safety?

This dissent is divided into three kinds: (1) dissent to G4's operations, (2) dis-

[3] The aftermath link: https://news.cgtn.com/news/2019-07-20/Aerial-footage-shows-C-China-gas-factory-blast-aftermath-ItXwLQzBg4/index.html and the mushroom cloud link: https://www.trtworld.com/asia/explosion-at-gas-factory-in-central-china-kills-at-least-10-28385 and numerous details https://www.cbc.ca/news/world/china-gas-factory-explosion-1.5219092

sent to its products (not just its standards) and (3) dissent to its lack thereof, its dereliction of duty. All of these distill into dissent to the people who produce them. G4 is free to again ignore me but also welcome to address and/or deploy any of the measures recommended.

The American Revolution was fought with volunteer soldiers. Imagine how difficult that must have been. ASTM G4 faces similar difficulties with its volunteers. Some within it ranks clearly prefer authoritarianism (Line organizations). Some do not. However, G4 is a voluntary organization. Its members act on behalf of their parent organization so their loyalties are by nature divided. That must be kept in mind. However, there is a noble imperative operating also.

And if G4 has retrenched for the past 25 years because of social disruptions, today's situation poses a threat to G4's very survival. Can G4's cognoscente argue they have created value relative to what was achievable and perhaps needed. Indeed, in today's climate G4 is even derelict if it has not made an estate plan, ...just in case.

This worker believes G4 is currently mismanaging its mission in several ways. It seems to continuously lament its lack of energy to do things, yet seems to waste and ignore the energy that is available, yet manages to cater to selected interests. The material contained in this dissent, is in some ways this workers oxidant safety estate plan, for it allows these shunned opinions to be archived so they can outlive their author. If G4 is so incapable of doing its job, as it so often laments, then G4 should configure itself so its past teachings can outlive G4 should that become necessary. Some suggestions to that end will also be included herein. But G4's materials can be ignored. That too is a voluntary choice that can be made. However, G4's materials should not be pulled like a rug out from under its subscribers if G4 ceased to exist.

Finally this commentator fears that the self-appointed bully cognoscente (NASA+) who exert so much influence over G4 at present, have their own oxidant risks. This worker disagrees with some of the decisions they have made in their own systems (for example, the space shuttle and SLS LOX Tanks), but not their right and duty to make them. Yet in the event of a disaster (say another Challenger-like) incident traceable this time to oxygen safety practices, G4 could be ripped asunder. NASA will want to defend their designs as consistent with G4 standards and will suddenly want to claim those standards are full-consensus something they themselves undermined. G4 would not survive, maybe it should not in that case. But to those of us who support voluntary consensus (real full consensus) standards, who felt G4 was a ideal organ to compile oxidant safety data and practices, who watched what I consider to have been Dunning-Kruger effect and confirmation bias poison the committee it will be a defeat. How will those subject to the oxidant fire hazard risks ever come to trust G4 standards and machinations again.

Section 3

Admin Stuff to Which I Dissent

G4 Prime Objective:

As of 2024, the Detailed Overview of ASTM-at-Large on its WebSite proclaimed:

> "Working in an open and transparent process and using ASTM's advanced IT infrastructure, our members create the test methods, specifications, classifications, guides and practices that support industries and governments worldwide."

Under that umbrella, albeit an umbrella that failed to cite, consumers, the G4 Committee Scope said it addresses:

> "The development and promulgation of test methods, definitions, recommended practices, and classifications for determining the compatibility and sensitivity of materials and configurations and applications intended for use in systems subjected to enriched oxygen atmospheres, taking into consideration but not limited to, ignition, combustion, offgassing and reaction products and decomposition tendencies. The Committee will also concern itself with the promotion and dissemination of knowledge related thereto."

These lofty perspectives are not *entirely* crap from the bull.

Transparency, promotion and dissemination of knowledge from a Committee whose existence is predicated upon the public service of pursuing safety. Wow! The writer is impressed. Hence these are the "standards" by which to judge G4. We shall explore how G4 is doing. In 2014 (G4 age 39) new chair Elliot Forsyth conducted a "quality" survey of members to see how G4 was doing and what it should be doing. He got 47 replies, nearly half the Committee. The survey suggested little progress over the previous decade. The writer was not the only respondent with critical comments. In 2025 (G4 age 50) new Strategic Planning chair Charlie Harper, essentially reported little progress over yet another decade. A few of those results will be cited here on occasion in an effort to avoid appearing like a solitary and "lonely" disgruntled dissenter, since such isolation (solitude) has been a curious basis for finding a negative ballot of mine non-persuasive.

Repeat: this is not a mystery novel. You do not have to read to the end to find out “Who dunnit.” My judgment: ASTM and G4 are not living up to their mission and charter. They are not evil or excessively malicious (hopefully), but I argue they are derelict in some of their duty, albeit perhaps duty they may disagree with. Regardless of how the prime objective is articulated, it amounts to loss prevention: preventing loss of life or well-being, loss of capital, loss of mission. Developing and promulgating standards can serve that end, and publicity, education, experimentation and collegium are all among the ways to promote and disseminate, ...but they may not always be the only nor best ways. And sometimes they can even be counter productive.

Defined-Consensus/Voluntary-Status Statements

First let us consider the robustness of today’s G4’s consensuses. Since the redesign or deterioration of ASTM from a “full-consensus” to a mere self-defined-consensus organization, today ASTM allows Committees to address negative ballots with a majority vote of the whole Committee or by a majority vote of a (self defined) quorum at a meeting. Committees can designate what a quorum is and in the case of my own experience, a controversial ballot that had repeatedly failed for more than a decade was finally voted on, not by the hundred member Committee, but at a meeting, yet not by the forty or fifty members that attended various parts of that meeting, but as the last act on the last day when the unanimous completely legal quorum (as designated by they themselves) of about six members (roughly the core group who were seeking to make the staunchly opposed change in the first place in the relevant sub-committee, and about ten (in the main committee) that were present and surprise!, they found my negative non-persuasive while enjoying their status as a defined-minority consensus.

G4’s standards were not designed to be court-room documents but they can and have wound up in that role. And since their claim is to be “consensus” documents (of a sort), yet not the historical “full-consensus”, it behooves the Committee to declare in the front matter of every standard just what the actual consensus for the standard is, as well as if there are persistent claims of dissent. And, if there are, then overview the persistent dissent or cite controversial references or sources, or even the negative ballot materials. To my knowledge, after the first twenty five years of G4’s life, every G4 standard could have contained a disclosure (not suggested as boilerplate) such as

> **Consensus:** This standard was balloted to the full G4 Committee and has been in public use for twenty years and there have been no challenges nor opposition to its suitability for voluntary use.

Whereas; today: full disclosure of at least one G4 standard would have to say:

> **Consensus**: The standard was altered after sixteen years of public use over strong dissent and is alleged to be unfit for service [***1***] which users may wish to appraise in deciding whether and how to voluntarily use this standard.

When G4 offers its public-service standards for voluntary acceptance (at least in some part) based upon a “delegated/defined consensus” for the opinions of others, it needs to disabuse its users of any lingering beliefs that ASTM standards are “full consensus” like they were in the good old days. Its current less-than-clear disclaimers that the user assess the merit of the standard for use deny them the otherwise nearly impossible to obtain data regarding dissent that might be viewed by some (including this commentator) as a serious dereliction in its committee mission to save lives, harm, capital, and user mission.

Indeed, if being honest in a fashion that seeks to disseminate and inform, then every G4 Standard title should contain the words “Voluntary Standard” for text can often otherwise appear to represent a much more mandatory or more thoroughly supported product.

New Brooms Sweep Clean

G4 is evolving into its third, maybe fourth, generation despite a very few old-timers (dregs) like me who still hang on (remotely in my case) from Generation One. New people, new opinions obtain. It can be much like when new department heads are promoted in a company. We have all been there. Me more times than I want to count. The new broom sweeps clean.

As you should know, a new boss arrives and the most likely first effort: is to mark the territory. Typically a new department name to improve efficiency. Then the offices have to be shuffled around to produce optimum access of the right people to the boss. However, more often than not, much of the department proceeds pretty much like it always did. But each department has its own brand. Like the nations of the world the issue of turf arises with some turfs reflecting great collegiality while others operate more like street gangs. The world has its reputed democracies but it also has its dictators. Change must be expected, and it can be but may not be bad. So it has been with G4.

Cognoscente Fiefdoms (CFs)

Cognoscente fiefdoms are what I think of as bureaucracies or more commonly fishes-and-ponds. Within G4, Education, Symposia, Research, and selected standards development have operated as small ponds with big fishes at various times. In what I also think of as Generation 2 and so far in Generation 3, G4 appears changed. It has shifted into a much more bureaucratic operation: self-appointed cognoscente fiefdoms have formed. Scary smart SGRs (smartest guys in

the room) act like alpha wolves, and with some success. Not lacking for hubris, many from the to-be-described NASA+ clique, have formed and with plausible, even valid, laments, they have dropped curtains over G4's less-than-great transparency rendering it rather opaque. At times they have been completely opaque. The SGRs meet and with something akin to Divine Providence make decisions that are then submitted to G4 at large, as mushroom members, to rubber stamp.

Rank and File Committee members are often faced with ballot choices to either affirm or see an overdue standard withdrawn. Major changes in standards have at times been dropped on the full committee often under time pressure and with disguised incomplete rationales and/or deliberately misleading rationale statements.

It can be rewarding (in various ways) to be a big fish in a little pond. In that paradigm, one's status grows when their own-size and strength increases ...or the pond-size shrinks. And over a period of years, the G4 pond has shrunk. To bullies, opaqueness, silence, and politics may be lamented as overwhelming work demand but they are also useful tools of the trade.

Bullies rule on the current G4 playground. Gangs of bullies grow to learn the joy of big-fish/little-pond, much as we have seen prevail in government in Washington DC and State capitals. How, oh how, do we learn to push back on the playground?

Conventional wisdom has often held the majority of bullies can be best dealt with by bloodying their noses (metaphorically in this case). There are however some that actually like having their noses bloodied. I have known some real bullies like that (one offered to break my real nose as a personal favor to a friend). And then there are also the possibilities that with too much force (push-back), a bully's nose cartilage can be metaphorically driven into his brain, or that one might miss their target and crush the bully's metaphoric windpipe either with fatal results. G4 still performs some worthwhile services and so its demise is very undesirable.

For example, In the 1985 G4 symposium, Jack Gilbertson's keynote address (can be read in *ASTM STP 910*) called for an education program to benefit "tyros". The very next opportunity (maybe that same meeting) the Education Committee was formed with Charter Member NASA's Jack Stradling as its first chair. Its spirit, motivation and intent were good but its energies were, as was typical, in way short supply. Stradling soon withdrew. There were no volunteers to succeed him. Hence, as designated volunteer, the Chair soon came my way and I prepared the course text, photographed coordinated slides (no PowerPoint software in those days). When the course launched successfully, to the Committee's great good fortune NASA's Joel Stoltzfus proved to be this superb instructor of incredible stamina who seemed to thrive in front of a class and was responsible for its public reception. Soon Joel welcomed the lead and I moved on as his Education effort became a critical success and lured a cadre of genuine and impressive instructors who were, as was expected, operating more or less autonomously hopefully within the course

established boundaries. The course carried the Committee imprimatur in its documentation, but the Subcommittee was largely pretty opaque. This does not mean to imply it was doing anything wrong and the students satisfaction surveys (largely due to Stoltzfus's brilliant leadership and personal performances) were beyond the wildest expectations. Gilbertson's education call was a home run.

The course was not focused only on post-graduate design engineers. Quite the opposite. Not even so much as a GED was required to attend. Pay your money and take a seat. A secondary benefit was that a community of interested course-graduates developed that helped grow interest in the G4 Committee and in some cases grew its membership. The "transparency" ASTM likes to boast about also grew. And yet, perhaps predictably, today G4 Education appears to have become a pretty closed cognoscente fiefdom.

Course instructors obviously color their presentations as they must with their own experience base, and that was baked into the course design, but the risk of an evolutionary bias was also possible. The course slides and course text were always the consensus backbone upon which instructor's experiences supplemented, while freely offering their opinions and context so that the classroom could factor all the perspectives into their own *voluntary* application of oxygen safety practices. In the early 90s, NASA+ WSTF members wrote a treatise on oxygen safety that was submitted to ASTM (it became *Manual 36*). It was later pushed for use as ***the*** course textbook. I protested for it was not a consensus balloted book and that it reflected NASA+ practices that did not spring from a larger community consensus, so it was balloted as a G4 Manual and became a supplemental course resource. An expert opinion not a mandate nor consensus. It is a superb writing in many ways and the Second Edition in 2007 won ASTM's Dudley Award for its success in 2024.

However, *Manual 36* remains a NASA+ perspective on oxidant safety. One can not but suspect and perhaps fear its portrayal in the course (based on a few factors) may reflect a too-strong NASA+ bias as to its merit. Course instructors have tended to be mostly current and former NASA or NASA–associated (NASA+). Recent examination of the first two editions again found it a wealth of information but again with some information that is controversial. Opinion that may or may not serve well in some cases.

Overconfident SGRs and Bullies

ASTM Committee G4 is both blessed and cursed with its core SGRs (Smartest Guys in the Room). They have allowed G4 to take on some daunting challenges. This has included some "off-the-chart smart" folks whomsoever can be daunting to challenge but, alas, also who in G4's case consider it an insult to be challenged. Oracles of Delphi they are. Self-Appointed oxygen safety Czars. Prima Donnas. All permeate the core Committee "defined-consensus".

So confident are they of their own superiority, which is indeed substantial in many cases but only self-perceived in others, they have succumbed to the lure of

the school yard bully. So superior are their intellects (in some cases) that it leads them to hear only their own voices for clearly those are the best voices. Sometimes it is best to let them bask in their supremacy and sometimes it is necessary to push back on the school yard.

I have worked with some of the world's top people in this field and related fields (many of which have not been G4 members, some of which were members yet never attended a meeting). They are people one should aspire to emulate. For within G4's current extreme overconfidence lies a risk that sometimes good judgment (the stuff I argue G4 needs most) is valued less than the twin facades of extreme academic status and ego. G4's SGRs should be wary about wisdom, but that has not stopped many of them from falling prey to Lord Acton's worst fears.

Undue Influence

So do the G4 cognoscente, what I fear have become cognoscente fiefdoms, exercise undue influence over the G4 operation? In my judgment they do. They pursue their own agendas (not entirely surprising in a voluntary Committee) and assign inadequate importance to collegium, the official charter of ASTM and G4 and G4's mission.

This is not an ancient issue. ASTM-at–large has two kinds of Committees: classified and unclassified. Classified committees are allowed to have as many members from a single interest/concern as desired but in combination they get only one vote. This is to prevent partisan bias from tilting the products. ASTM G4 started as not classified because of its public service orientation. It current stus is uncertain. However, over the years, representation and influence has become lopsided. The NASA WSTF members and the many with prior or current WSTF affiliations are able to indeed exercise undue influence. It accrues to them through no fault of their own. The danger is in how they exercise that influence and in this judgment it has not always been consistent with the G4 charter. In some cases, undue influence has been exercised though its origins are not always clear. Many of these folks are highly motivated and highly qualified but whose roots bear a common perspective and therefore represent a bias. Combine that with the difficulty of finding energetic members from smaller less motivated sectors. Indeed, the two effects seems to foster a presumption of manifest destiny for certain SGRs to rule.

One comment in the 2014 performance survey (not from the writer) commented: "Unfortunately, the bulk of the new information is coming from a limited number of sources." This view reflects the great conundrum of G4. Work gets done by those who do it, and many members have no time or ability to do the heavy lifting needed. However, it is also true that the situation is not completely inadvertent and unavoidable. Over the years, unfortunate and perhaps at times intentional efforts have served to prune out contributions from other than the G4 self-appointed SGR ruling clique. Contributions have been ignored and outright refused. Peer review has been used to censor unwanted heretical material. Conflicts of interest

have been ignored. It may not be collegial to proclaim the impression that G4 is dominated by and dependent upon a core group of “the real experts” but that impression is held by many (including this writer) and so this case has been made.

Within the widely-endorsed fundamental system design ethics that cite G4’s goals, there can and are in some case extreme differences in how to apply design ethics. For example, one can cite a fully ethical system design that stresses ignition prevention over propagation prevention, while another might cite a fully ethical system design that stresses propagation prevention over ignition prevention, and sometimes “all of the above” are advocated. To choose a preference is to in fact define a preferred bias. Yet all these approaches can be circumstantially valid. And under what this commentator considers the undue influence of NASA+, important materials have been ignored, discouraged, censored and swamped.

Domination and censorship (i.e. undue influence) by the NASA+ clique may be offensive and counterproductive, but does not have to be bad. Indeed, if their perspective were clearly the best that could be, its undue influence might even be desirable. However a case can be made that notwithstanding the many and extreme talents present in the NASA+, it is not nearly infallible and has demonstrated more nearly a parity in numerous situations. And it has erred, sometimes badly, also. In the writer’s judgment, it appears to have misjudged the hazards of aluminum, has played politics with fire limit measurements, censored the importance of carbon in steel flammability, has committed experimental blunders and even trivial errors among other offenses that are documented in some detail in supporting related commentary [***9***] not intended to revile but more as a reality intervention. Among these, and perhaps most importantly NASA+ hubris has allowed its ego to support what this worker considers an alleged hornswoggle that the writer argues has, notwithstanding the progress that had been had, had serious negative effects on meaningful oxygen safety progress for a number of years [***10***]. And under this undue influence, this worker argues NASA+ influence has turned its open literature series into a self publication organ that caters more to fleshing out CVs than fostering safe use of oxidants [***11***].

Curiously, there is no shortage of criticism of this kind about NASA-at-large. We saw some after Challenger, and we can read about it in books like ***The Mission***. Many of us have our own stores of NASA arrogance like those cited earlier. I have therefore made my case for why domination and censorship (undue default influence) are neither the best that can be nor the best that is available at present.

To repeat, the NASA+ is talented and needed and important and vital. Everyone, this worker included, is in awe of their talent but while even I felt their influence and contributions would and should be massive, I now argue they drank to much of their own Kool-Aid and they have at least in some circumstances exceeded their impressive but not nearly infinite competence level (Dunning-Kruger Effect).

From the very beginning, NASA participation in G4 has been substantial and

critical. NASA members from at least five locations have been talented, hard working and motivated. Nor is this to be critical of industry from whence this commentator came, after all industry members had the additional effort of the marketplace to deal with and in many cases NASA was a customer of theirs, and soon a world wide quality movement would magnify the effect of the traditional: “the customer is always right” ethic. This commentator has struggled in no small degree with deference to the expert/customer and has deferred often as a “quality” measure when push-back may have been needed. However, notwithstanding the many and even critical contributions of NASA, it is my judgment today that the NASA+ clique has for some time been exerting undue influence and needs to “collegial up”.

It was not destined nor always that way. When G4 began numerous NASA members were among the most collegial, most humble, often citing a corporate mantra to avoid not only the fact but the appearance of impropriety. Perhaps they were still smarting from their comeuppances with the Apollo one and thirteen oxygen fires. Even for them oxygen had a tendency to rear up and bite them. Indeed, they wanted very much to work with industry. When they launched a make-over of their oxygen safety approach they invited numerous industry folks to participate (I was one of them). That worm seems to have turned. Today G4 is in my humble opinion become a class structure. The bully and street gang metaphors fit.

For NASA’s own good, it needs to be very careful flexing its prestige and its consumer muscle. Instead of being Zeus on Olympus, it needs to help tutor industry on its strengths and listen more carefully to what industry and experience can teach it.

The Hydrolevel Nightmare

An episode of undue influence occurred within ASME known as the Hydrolevel Case [***12***]. Apparently a number of overly self-confident committee leaders (who may have had conflicts of interest) were asked if a particular component met a certain safety standard (possibly code). These committee cognoscente in leadership position responded that it did not. In that declaration a company Hydrolevel was apparently put out of business. The Net reports a lawsuit resulted in a $5M judgment against the non-profit ASME that would send shockwaves through standards groups everywhere resulting in treble punitive damages for allowing its Committee officers to act that way.

In this case I worry that ASTM G4 operations are unduly influenced by the NASA+ clique, largely swaying operations and content towards a NASA+ (perhaps NASA-at-Large) perspective that I circumstantially dissent to. And while I do not oppose and indeed support NASA+ having its full opinions expressed, possibly even preferentially, I recoil at having other, including my, opinions censored by them. This is yet another excellent reason why G4 standards should not be codes. And I fear that within the G4 teachings of oxygen safety opinion are positions that reflect the

druthers of the NASA+ rather than objective scientific perspectives. I argue several NASA and NASA+ efforts have been bad science. The bases for this fear are recited in numerous supporting analyses [***9***] herein. Indeed, I also fear there may be some in the general public who still believe G4 Standards among other ASTM standards or that standards in general reflect a full consensus or legal basis but my own experiences prove G4's standards are being tilted into politically generated products that obscure and even outright censor dissent. Transparency demands the loss of G4's full-consensus posture be publicized for in this view it is a grievous over-swing of the pendulum.

Preaching to the Choir

Today ASTM G4's NASA+ faction appears to this defacto, "assigned" outsider to be operating as largely obscure self-appointed oxygen safety czars, and while that is, or at least should be, an improvement over pure anarchy, it is not best serving G4's mission. The cool kids talk to themselves and every now and then share their pronouncements with the riff-raff. One is tempted to refer to these pronouncements as coming from a NASA+ Star Chamber. And while it may meet current ASTM operating requirements, in this humble view it is asking for trouble and that case has been made many times and most thoroughly.

Stagnation

ASTM G4 is now or soon will be evolving into its third/fourth generation of operation. Gen 2 has deliberately done very little in its era beyond the routine maintenance, ...partly a deliberate choice, partly a result of world-wide trauma, but partly in this opinion dereliction. By its own statements it had rationed its work, focusing on doing its education course, its symposia, an early limited amount of laboratory research and minimal standards maintenance (with rare exceptions and some revision). And as noted earlier, there have been reasons that justified some deliberate stagnation: 9/11, the housing bubble, recession, war, that all tend to be significant distractions. However, these distractions layer onto the base distractions that have always obtained. Progress is difficult but not impossible.

Several times new standards, revisions and initiatives have been proposed (I have proposed several) but for more than a decade G4 has resisted (or failed) in new initiatives and some (most) have been abandoned or ignored. Those actions in effect censor products and withhold them from the full committee and therefore full community. That is okay if its ultimate goal has been achieved and certainly a lot has been done. However there have been incidents and at least one Top-Ten spectacular incident (in Sanmenxia China). There have been challenges that warranted, even demanded, new initiatives. There have been opportunities that have been ignored. While one might be tempted to say these issues "fell through the cracks" of an overburdened understaffed team, the excuse is provably specious. And of

course there are the specific judgments rendered herein. G4 may not have had adequate energies to conquer all of the new challenges available for the early-past two decades (despite energies that were disdained, and declined), and it may not be possible to prevent every incident, but the oxygen safety imperative has been underserved.

Wrong-Way Development of Standards

Corporate memory loss (also called Corporate amnesia) often examines how worker turnover, retirement, and a series of factors can cause a company to forget how to do what it has always done. In 1977 I purchased a new General Motors car they would have been ashamed to produce in 1940. In some cases memory loss is encouraged in the hope that fresh, new, better, ways to do things will be found by the smarter, better, newer generation. But maybe that does not always happen. In following G4 to the small extent possible these days through it oftentimes opaque veil, I can surmise the newer generation rejects the earlier efforts and perhaps even the idea of collegial standardization. But I can also surmise that G4 may have simply concomitantly forgotten how to do standards and does not know how to relearn.

This problem is doubtless exacerbated by ASTM's ham-handed (one is prone to suspecting corrupt) adoption of Microsoft software and related procedures imposed on committees. This is like a one-two punch whammy. The new procedure is despicable. ASTM abandons things like full-consensus but seeks instead to dominate the minutia of how standards are composed (not structured but composed).

The new procedure apparently establishes hoops that must be jumped through. Task groups are formed with invitees, emails are sent out and often incomplete and disjointed debates are emailed around. Chaotic phone conferences are employed. MSWord software of the latest persuasion is used that not everyone is familiar with and may not have access to. I have experienced the SYSTEM twice and quite simply it sucks.

And yet G4 needs to grow a new pair. ASTM is not all powerful. I can recall numerous battles waged with Kathy Green when she was in publications (currently ASTM retiring President Kathy Morgan). The ASTM System in the 1980s was almost designed to prevent the prompt publication of Symposium proceedings. Under the optimistic encouragement of Keith A. Miller (a coworker) G4 set out on a quest to have the book published in time for distribution **at** the symposium. It took a lot of work and sacrifice but in 1997 G4 accomplished the task at its 8th symposium, *STP 1319*, 1997, for the first time (with no small amount of personal sacrifice and a series of failures), and rumor has it that it has been able to repeat the task many more times since, but may have finally (2025) lost or scrapped that skill as well.

If G4 finds ASTM too adamant to facilitate rather than dictate minutia, then

this thoroughly experienced operative recommends that G4 as a part of its normal proceedings return to its former method of developing standards as an informal precursor, to work up an effectively final-form and consensus and only then go through an artificial pro-forma perfunctory conformance with the ASTM tyranny.

To wit, in 2003 I was asked to lead a revision of G88, a four page standard that had taken me about six months to draft, process and final vote on in 1984 (during my own chair of the full committee). Using those same old methods, I solicited and collected together data for a revision *from the full committee* (including the results of numerous accident investigations over the twenty years interval). I sent a draft out for comment and negotiated personally issues on two controversial points (flow friction and document length) and a joint full committee ballot resulted in one none-technical, therefore nonvalid, negative (one member wanted more time to think about it). That request was nonetheless accommodated but then under some kind of pressure, the ASTM PROCEDURE was demanded. So Elliot Forsyth assumed chair of the revision and spent two years jumping through ASTM procedural hoops only to publish the ~24 page revision after those two years with virtually no substantive changes and only a few cosmetic edits.

I am not aware of any comparable progress since. Admittedly G4 does appear to be stuck in a development loop just like that which thwarted progress when G4 was brand spanking new in 1975. Alas corporate amnesia has many downsides. Accident investigation learnings are also forgotten, mistakes are suppressed, etc. All of this must be resisted.

A recent (2024) assessment of ASTM G4's status and issues by its new Chairman of strategic planning (Charlie Harper) reads like the record of G4 at age five. G4 appears to have fully forgotten the hard-won solutions it learned in its first decade. That's corporate memory loss for you.

Dissent

Dissent in the standards development theater is most powerfully reflected in negative ballots. As noted earlier, negative ballots were once upon a time a big deal, but the modern ASTM procedures now allow negative ballots to be worked around or ruled non-persuasive with little work and little or no technical merit.

At present, G4's cognoscente appears to care little about standing dissent which has been largely censored. And indeed, the putative original historical basis for seeking full consensus may be formally obsolete. However, I would argue the benefits of addressing dissent (either by adjustment or recognition) can still have value in defending lawsuits.

Therefore, this is to argue that every G4 standard should contain an overt statement on dissent, perhaps integrated with a corresponding "Consensus" declaration (since not every dissent would necessarily result from a ballot vote). Such

statements should declare unresolved challenges to the standard, their bases, and the bases for finding them non-persuasive. I suggest a claim that the Committee does not know how to use its own standards, or a claim that legitimate negatives can not be filed in solitude, and that standards are immune to dissent that the ballot scope does not permit are inappropriate. Consensus and dissent declarations qualify as "transparency" that shift a duty to address some the issues to the users while providing the users with tools to help them make informed choices. But that is not the case within G4 today.

Opacity...B-a-a-a-a-d!

As of 2024, perhaps still, the ASTM website proclaimed "*ASTM International offers global access to fully transparent standards development*." Even though the previous and precious "full" consensus claim has been lost, ASTM now claims devotion to "full" transparency. Really? Consider ASTM Committee G4. Indeed, for nearly a decade before retirement, I exerted no small effort to publish a free newsletter within weeks of every meeting. Its mission was not just transparency, but a source of context and clarity, a lure to new members, a way to boost interest and get words out, and a way to prime and tutor the entire community. I like to think it helped bring G4's membership to top a hundred for the first time and its subscription base exceeded 200. Within a year of my retirement (but not withdrawal from the Committee) the newsletter was scrapped. It was "nice" but there were no volunteers among attending members to do it, and no interest in "solving" the problem. Score one for opacity and another for false commitment to transparency. Not only that but at the time the abstruse G4 Minutes of meetings also became a rarity. What ever G4 was doing was known only to a select group of insiders.

ASTM has been pretty scrupulous in ensuring use of the following advisory:

> "This document is not an ASTM standard; it is under consideration within an ASTM technical committee but has not received all approvals required to become an ASTM standard. You agree not to reproduce or circulate or quote, in whole or in part, this document outside of ASTM Committee/ Society activities, or submit it to any other organization or standards bodies (whether national, international, or other) except with the approval of the Chairman of the Committee having jurisdiction and the written authorization of the President of the Society. If you do not agree with these conditions please immediately destroy all copies of the document. Copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. All Rights Reserved."

This is how ASTM assures its commitment to transparency for activities that in principle are open to the public. Score two for ASTM and G4 opacity.

Indeed, my comment to the G4 2014 quality survey question regarding sug-

gestions for the Committee was that the Committee was way too obscure. As a member who could no longer attend, I found it nearly impossible to find out what was going on in those smoke-filled back-rooms despite serious efforts few others would exert. For years either no minutes at all issued or numerous sub- and even the full-committee issued indecipherable minutes. One of new Chair Elliot Forsyth's first major efforts (in about 2014) was to consolidate subcommittees and a major result was there were fewer un-issued minutes. So instead of failure to issue minutes, the absence of such data was simply absent within other similarly not issued minutes. But overall the increase in real "transparency" was nil.

G4 could incrementally increase its true transparency by issuing a blanket permission to circulate/distribute all its proceedings. Getting a blanket letter of permission from the President. Perhaps even posting them on an open Website. A G4 website Dwight Janoff produced open to the public, unlike the current site was dropped in this same time period. A later discussion will address how ASTM pricing of G4 products (which involves "drivers" beyond the Committee's mission) is also antithetical to transparency.

Dissemination (An Opposite of Opacity)

"The Committee will also concern itself with the promotion and dissemination of knowledge related thereto." *Disseminate*, transitive verb, **1** : to spread abroad as though sowing seed, **2** : to disperse throughout.

One can, I know I can, and I do, argue that while ASTM G4 has taken a chunk, a major chunk, perhaps a majority chunk out of its mission to generate *voluntary* standards, that its mission to promote and disseminate still has a long ways to go and has lost ground. I might be tempted to issue a failing grade. And I make this claim fully well knowing that fifteen symposia have been held with proceedings published and likely thousands of students have taken the G4 education course.

Indeed, those dissemination actions were perhaps the first, and most important steps one takes in that regard. However it is far from complete. There are whole classes of people not being disseminated to. Maybe some never will be. It may be unfair (but as member Joel Stoltzfus has tutored in G4 meetings on this very topic "the world is not fair"). Nonetheless, as of this writing, the majority of those disseminated to are engineers, or scientists or technical support staff to engineers and scientists whose needs justify the rather substantial cost. And while that is a much better thing than nothing, the audience and the ante are both less than laudable. Not everyone, indeed, not even a majority of people need or can benefit from oxidant safety knowledge, but G4 is not serving the whole audience it should, nor is its portfolio complete, nor is its portfolio quality up to snuff.

Public-service dissemination includes documenting the knowledge, it means making the knowledge readily available, it means making the knowledge practical. In all of these areas G4 has a ways to go, after losing and giving up ground. In par-

ticular, right now product ante is especially bad, but things like longevity, settlement, compilation, segregation, and synchronicity all need work also. Consider the following sections:

Product Ante

You know if you come upon a car accident and someone is trapped inside, it is a very ripe situation to market one's assistance services at high prices but such marketing is illegal.

Committee G4's documented goal is to upgrade safety among not only producers but vendors and users in the real world. And to avail oneself of these amazing materials one need merely purchase its public-service products:

Part 14.04 of The Book of Standards—about $318/year for each revision

Sixteen Special Technical Publications—about $1700

Its Education course—$1250 per person

Committee membership: $50 per year

Attend its biannual meetings est. $3000+ per year in travel and lodging.

Education course textbook: Apparently, not for sale.

Manual 36—$91-$96

New separates as they are revised—typically $68-$90 per standard and up to an average of 5 revisions due per year (24 standards/5 year revision schedule). Almost less expensive to buy Part 14.04 every year.

Perhaps the most serious allegations advanced here is that G4 is not stewarding this prime objective. Even when I was a Fortune 250 company Corporate Representative I was unable to budget this amount of vigorish. Neither ASTM nor G4 nor any member company benefits from standards that are not disseminated (sold), therefore not used, due to their cost. Ideally, G4 standards and related materials should be ubiquitous and available to everyone who might or who does need them. G4 needs a formal stewardship effort to among other things, control and target its costs to others and some suggestions (to wit: compilations, segregation, synchronicity) are cited below. G4's prime objective is not as a forum for fleshing out university curricula vitae. True affordability (costs within the customer's budget) and artificial affordability (subsidy from others only when needed) can both play roles. Indeed, G4 needs to consider open posting of its standards and more. One major obstacle in preparing this dissent was lack of the latest standards, and publications from G4, which I prudently declined to re-purchase yet another time potentially leaving myself open to criticism that I am not up to date in this commentary, yet thereby proving some of the points I am making.

Herein, the seeking of grants/donations to replace the operating income lost should be considered (broached to G4 in 2009 and rejected). The STPs from symposia can offer “sponsorship” blubs. Perhaps companies can be encouraged to allow matching of donations to G4 since it is a nonprofit public service (in alleged principle). Donations to G4’s STPs and publications (especially compilations to be discussed below) can seek to cut the prices to where purchase is considered an inconvenience rather than a mini-capital expenditure. Making the availability of standards and research results commonplace (perhaps even ubiquitous) serves the G4 mission.

Usability of Products

Longevity—Looking back at nearly a century of oxygen safety practices, this observer would argue there has been little of the currently vogue disruption. Everything that was done is still basically good to do. New discoveries have complimented rather than contradicted existing “old” knowledge. Many systems safely operated in 1950 can be operated safely today in the exact same way, ...*if their circumstances have not changed*. However, there have been changes in circumstances, new knowledge and materials and procedures, and some will be cited herein, that can and do serve as traps for the unwary. Hence a copy of G4’s first standard G 63 issued in the 1980’s is still largely a useful document. This aspect as well as any exceptions to it should be a focus of Committee commitment. G4’s standards should not be cooked to make them *seem* like new technology, like model year makeovers with tail fins no less, while its exceptions should be targeted for recognition and publicity. This is also a goal here.

Settlement—Because oxygen safety practices for the most part enjoy longevity, that fact should be celebrated. Many practices are “settled”. There is no need to cook the books for the sake of appearances. The writer studied “determinants” in high school in 1961. By the 1990s he had a chance to see a modern high school math textbook and its section on determinants. So many cosmetic changes had been introduced that it looked like a new subject and that the material he studied was now obsolete. Sadly it was all cosmetics almost as if some sales group was trying to convince folks that it was as new and as amazing as the latest innovation in toilet paper. Oxygen safety is not a profit center and one goal should be to retain and entrench perspective that can be counted upon. Standards should not be revised willy nilly to make them *look* new or vogue or to mark one’s territory.

Constancy—Standards should be viewed as touchstones. Their constancy should be something that can be counted upon. This commentator can recall in the 1970s when a new revision of ASTM Standard D2863 (The Oxygen Index) came out. The early editions of this new standard were not well written and were easily misinterpreted, in some cases were wrong, and many changes were made. None-

theless, the appearance of the standard changed so massively that one had to struggle to determine the “real” meaning of every new sentence when in fact almost all of the standard had been unchanged in intent (procedure and goal). It would have been much preferable from the user’s point of view to focus on the errors that needed repair rather than to rewrite the entire document. In that case a few careful footnotes could have fixed all of its issues. G4 should seek to cast its standards into concrete when ever possible. Change should be incorporated as inserts and footnotes and errata for the sake of the user who may just misinterpret new text, no matter how elegant the new text may be.

G4’s record on constancy is abominable.

Compilations—I submit G4 needs to focus not only on producing good standards that can serve its three prime objectives, but on focusing on making them attractive to use, easy to use, effective to use, so that even its most humble “customers” have a strong motivation (and ability) to choose to use, or at least be aware of, them and very importantly they need to be durable.

In that regard I would hearken back to 1997 when G4 charged Mike Yentzen with guiding publication of a compilation of G4’s standards. What resulted was a more economic, easier to use 212-page booklet containing all 20 of G4’s standards and three adopted from other committees. Today this list would apparently contain only one additional standard. A much more convenient tool than the Book of Standards, Part 14.04, 1000 page monstrosity. It is a main tool I use to this day despite being extremely dated. G4 needs new “smart” compilations of its standards and perhaps even abstracted, integrated or separate key selected papers from its symposia, especially papers that provide example material reviews or design strategies. Especially papers that have been designed for inclusion in the compilation. Compilations can be a powerful tool.

Segregation—I want to argue that many of G4’s standards are pretty settled and should be segregated; These are mainly the Test methods and their supporting documents. To wit, D2512, D2863, D4809, G72, G74, G86, G114, G124, G125, G120, G136, G144, G127, G122, G121, G131 and G126. G124 and G175 are somewhat problematic but should also be included. These standards (most or all of which are Test Methods or support test methods and with two exceptions have not changed in intent greatly since Yentzen’s 1997 compilation and there is little likelihood, with perhaps the one or two major exceptions, they may never need to change. They should be compiled into a single inexpensive document perhaps supplemented with selected or abstracted papers from G4 symposia.

Similarly, the Practices Standards: G63, G93, G94, G128, and G145 would tend to be used together and should be compiled into a second document again with selected papers and perhaps ad hoc textual supplements.

Synchronicity—I plead with G4 to do mass collective re-approvals of both compilation sets. In this way each compilation would be current for a full five-to-eight year period or longer with reapproval. Then a re-re-approval can refresh and update and expand all documents simultaneously. During the active five-to-eight years, addenda and alerts can issue if errors are found.

Then do a support-standards compilation (A State-of-G4 document or other) that will likely be unchanged for a decade or more. If (or when) revised, it should have a preamble to declare how it has changed. It should contain a commentary and contain blank pages for note taking. It should contain pages of conversion factors, charts, etc and, reference numbers, even phone numbers, web links, and perhaps even ads. *It should be made into a Tool.* ASTM has a need to ensure its standards have a robust shelf life, but G4 also has a need to design standards that resist becoming obsolete and obscure. Lunch meat contains preservatives to prevent harmful spoilage. Preservatives should be invented for G4's standards. Indeed a goal to consider might be to render it so practical and affordable that it might even be used as publicity handouts (as has been done with some G4 documents in the past) by vendors and otherwise become ubiquitous. Cosmetic re-approvals or changes to mark territory should be avoided.

Both compilations (print and electronic) could and should be included as handouts in the G4 Education course. If needed or requested, subsidy's for these compilations should be sought or accepted from those who benefit most from them in the form of grants and honoraria mention in the compilations themselves. Many companies have matching donations programs and perhaps donations to this public-service effort could be qualified. And yes advertising should be allowed.

In 1997, the Yentzen Compilation was a significant amount of work and I believe required a subsidy from the G4 fund. Now 25-years later, we have on-demand book publishing from various resources including Amazon (typically using Espresso book publishing machines). If ASTM is unable to provide a practical alternative, or negotiate a deal with Amazon or Barns and Noble, etc., or does not own a machine itself, G4 should look to reinvent its own system. This same situation likely affects dozens if not hundreds of other ASTM Committees. And its absence today is an extreme dereliction in both quarters.

Quality

In the 1980s the world-wide quality movement arrived. With it came such "wonderful" ethics as "Continuous Improvement", "Continuous Commitment to Customer Expectations" and so much more. A key tool to achieve quality was the quality survey akin to that Elliot Forsyth conducted in 2014 that is cited so often herein. Unfortunately the ideal quality survey is sought from one's customers. G4s members are not customers in the purest sense. G4's customers are the people purchasing and using oxygen and other oxidants. They deserve more focus.

However this is not to disdain the merit of the 2014 survey which was substantial but less than very effective. One might ask however, how can G4 disseminate wisdom when its collegiality is so problematic. When its leadership clique thinks it is ***the*** model for others to copy.

Redundant Text

A recent (yet years ago) revision of a G4 standard deleted text that was redundant in other standards in favor of a simple referral to the source standards. Redundant text was eliminated.

Redundant materials have been addressed by G4 on at least two occasions. In an early instance, redundant materials were heartily endorsed. G63 and G94 are both material selection standards. There is enormous duplication (redundancy) of topics with fine tuning of context to focus on the differences between metals and nonmetals. The two standards could have been combined with a reduction of combined pages but with an increase in likely confusion between the two processes. G4 opted for the greater clarity. Similar redundancy appears between the abstract standard G128 and *all* of its support standards. Indeed anywhere need for precision is necessary, sections can be written so that that they can be quoted verbatim in multiple standards.

But perhaps *most importantly* in terms of such things as the previously cited service to one's customers, redundant text avoids the requirement to buy (at user expense) numerous standards just to get a complete picture. This can impose upon users delays when they find their need to buy more and might likely and justifiably come to surmise they are being victimized in a commercial gambit to force them to spend more. I know that is how I feel.

Software

Electronics/Software is a thorn in ASTM G4's side. ASTM apparently hates software (at least the free kind). Even when the software is fairly basic, even when the software has extreme disclaimers and has been vetted and balloted multiple times and has a history of safe use, the same as any standard in the G4 portfolio, even when the software is far more likely to help G4's standard users get to the right answers, than to provide wrong answers. Something not every G4 standard can do.

G4's subject area is not trivial. Furthermore, G4 has on occasion published erroneous and false data, including data generated by some of G4's and the industries most astute members that were simply wrong [***9***]. One G4 "consensus" standard ignores and censors staunch dissent. Hence G4 should publish historical errata summaries, and clarifications, perhaps as a standard. The notion that G4's existential purpose in life is better served by dumping these advanced mathematical concepts (so challenging for even the most lettered among us) on far less astute users might be viewed as setting up quicksand traps. Can one genuinely believe

there is liability merit to ignoring the traps rather than provide the tools most likely to serve the Committee trinity (save lives/harm, capital, missions)?

In the mid 2000s G4 folded to ASTM pressure to abandon its own software (G4Math V.1.2) despite the number of copies (>1000) already distributed. As a result, this and other practical software adjuncts are badly encumbered, if not thwarted. However, just as G4 recommends slowly opening valves to prevent compression ignition, or cleaning of hardware to prevent contaminant fires, I am here to argue that whether or not G4 has prepared, vetted, and distributed any software, G4 has a duty to advise about software hazards the way it advises about adiabatic compression hazards, especially software misuse that can lead to the same consequences. This dissent proposes a standard on software [***13***] and another on software-generated data [***14***] not at all unlike the way G4 incorporates tables and figures and graphs (often generated with software) in order to get its message across. Indeed this commentator sees little difference between a computer utility that might generate erroneous data and a print publication that lists those same wrong data in a table or figure, usually with less care, precaution, and no disclaimer.

Utility Software. G4 no longer provides G4Math12 software that does about a half dozen different non-trivial calculations and has shown no interest to upgrade it. Presumably G4 no longer teaches its use in its education course. However I have upgraded the original code for newer (64 bit) computer use, and may make it available (under a new name and with no G4 imprimatur). It would be better if G4 did that but lacking that does need to take a stand on it just as much as it takes a stand on whether to open valves slowly. This tool can help oxygen compatibility practitioners to both learn and achieve the safety goals G4's mission proclaims. It would be to their benefit to have G4's sage help. It is again "as Is" and "use at your own risk", but is now unvetted, un-balloted and far less proof-tested on its functions that have been revised in view of changing times. But G4 can vet and alert and add its own cautions or not in an approved standard, like the proposal [***13***], that effectively evaluates such utilities.

Indeed, while reprogramming the EIGA /CGA Piping criteria for the G4Math12 re-write, it became obvious that that group's ("printed") recommendation was flawed. It made two slightly different conflicting recommendations (possibly fixed since?). Something that was easy to do when drawing a curve and running a line to perhaps the wrong point but which stood out when converting into code. It is a small error, but it is in real error. Coding standards when possible is a powerful way to vet standards.

Other draft utilities to estimate Real oxidant adiabatic compression temperatures, to estimate rough TNT equivalencies, and to read thermo-chemical equilibrium metal combustion profiles would all be far more than "nice" additions. They would serve many functions and G4's mission.

Thermo-Chemical Equilibrium (TCE) Software. TCE theory is a powerful,

even if not perfect, way to obtain insight into combustion processes. Originally introduced to G4 and advocated by NASA+-associates in the early 1990s [***15***], use and misuse of a NASA program (Gordon-McBride Code), apparent bugs or quirks in the code, and failure to detect erroneous data led to a series of publications with errors, during which the original advocates of TCE theory soured and were largely and wrongfully disenchanted. Alternative code has at least partly clarified the issues but may exhibit problems of its own [***16***]. My own, less than fully qualified, repeated efforts since 2008 [***16-21***] to support TCE interpretations have been futile (I now qualify as a pariah, no doubt) but have identified and resolved some of the problems, and notwithstanding any learning-curve errors therein have pointed the way to what may prove to be a highly useful advance in oxidant safety methodology.

While actual hands-on use of TCE software is probably best avoided by the rank and file (and even some of the others), the results of TCE theory and code can be reduced to familiar figures for metals combustion properties that can easily be interpreted by the rank and file especially if they are supported with reader software [***14***]. Could there be ulterior motives behind the cognoscente demur?

The mining of TCE software is difficult. Code other than NSA's CEA is expensive and frustrating-to-use and is fraught with pitfalls. It clearly commands an elite leadership that is currently demurring. Issues that G4 could and should be working on languish. Yet G4 cognoscente laments the lack of energy but has disdained every one of this pariah's efforts and proposals. Nonetheless, my latest efforts [***14,16-21***] may forecast ways to achieve (and possibly experimentally verify) rankings for metals in far greater numbers and details than the current theoretical effort that are limited to elements alone including the small scale experimental tests listed in standard G94. They have pointed a way to define new parameters and a draft standard included in this dissent [***14***] proposes how a digital atlas of TCE data should be published and software configured to allow even those whose appreciation of TCE theory is scant to still extract data such as standard and in-situ heats of combustion, standard and in-situ adiabatic combustion temperatures, traditional and more pertinent burn ratios of either melting-point or boiling-point variety) and other understandings such as fire limits of theoretical alloys. For details see [***14***]. G4's deliberate silence for decades on this is a dereliction of duty that sullies all of its other works.

Computational Fluid Dynamics (CFD) Software. CFD theory appears to be a much greater challenge to learn and apply than even the previously cited challenge of TCE theory. But it is still useful even if less compelling in scope. Available CFD software allows predictions of gas flow patterns but like TCE, its software is not for the inexperienced rank and file. It can give insight into how particles and flammable gases mix and flow and impact and compress in systems. It can make realistic predictions of how things like dual vortex (ASTM G88 Figure 11) flow patterns can define vulnerable impact sites at surprising places.

CFD can aid in incident investigations to test causal hypothesis. At present

scant use of CFD is found in G4's symposia. It does not appear to be cited in any standards nor translated in any standards. But it should be [***13***].

However, practitioners of CFD software use for the present are highly esoteric and the role for CFD software is again even more obscure than for TCE software in cataloging examples of CFD analysis (such as for the previously cited dual vortex mechanism). Furthermore extracts of example analyses may not be as easy to configure for the rank-and-file. Nonetheless its potential and a consensus perspective on it should appear in G4's body of work.

Thermo-Physical Properties Software. Thermo-physical properties are crucial and many are commonly published. Often they are approximated with ideal gas models. This commentator has published a long comment on numerous issues related to real gases versus ideal approximations [***22***] and the implications of both. While industrial companies tend to generate their own thermo-physical properties data, the rest of the world can access a NIST software package or internet algorithm [***22***] as a highly credible source. G4 members should take a stand on these data and any flaws it may contain or concerns for its use identified, as well as reviewing its uses including those cited in this writers analysis with similar vetting. It should also publish extracts of particular note in its standards. Again the rank and file may not be equipped to employ this software and should be forewarned, but selected extracts and reader software should be both workable and valuable.

"Reader" Software**.** Virtually everyone knows about Portable Document Files (PDF) which are a compact standard file format for text and graphic material and generated with a range of software (the original Adobe Acrobat, as well as many text, publisher, spreadsheet, browsers and other software). Among oxidant safety needs are access to numerous data. For example, G88 provides tables and graphs of examples of adiabatic compression temperatures. However these data like many others are often most effectively plotted as log-log or semi-log graphs that are a challenge to read unless one uses a quality vernier calipers and does a bunch of onerous conversions of dimensions. Graphical reader software is not difficult to code nor too persnickety, and it can allow cross hairs to be placed on graphs to simply read the data point for you to the maximum precision possible. As for the G4Math software and a successor, this worker has coded examples that are like that but they are un-vetted and increase the challenge for users to qualify them for their own uses when better G4 opinions could be offered. Such experimental readers could include the ability to read real oxidant adiabatic compression curves generated from NIST software in any of the three formats, and thermo-chemical combustion "profile" curves to extract a whole range of data (Heats of Combustion, Adiabatic Combustion Temperatures, Burn Ratios, TNT Equivalencies, etc.).

ASTM Productivity **Software**

There is, however, software that this worker is more than happy to condemn while still claiming not to be a troglodyte. I am in reality quite the opposite. I began

coding algorithms in 1968 on a Bell Telephone Laboratories IBM 1620 “scientific computer” using Fortran II language (Did you know there was such a thing?) with input/output using 80-column keypunch cards. Hence, I am a dinosaur soon facing my own extinction. Consequently I enthusiastically endorse cautious use of various software adjuncts that ASTM apparently disdains. But I must note ASTM does not oppose all software. As noted elsewhere it sells CHETAH, but it also boasts about its adopted software infrastructure containing the exact software this worker is willing to condemn.

Such infrastructure largely, but not exclusively to date, includes use of Microsoft Word for standards development, and Microsoft Teams and WebEx for conferencing software for virtual meetings. While these softwares have their uses, I must condemn the ASTM software edict and maybe even their classes on standards development that apparently cite the previously mentioned and condemned procedure for development of standards.

My first (and last) experiment with WebEx was a quite unpleasant remote presentation to G4. WebEx is powerful but it imposes a learning curve. It is fine for those who have paid their dues to climb its learning curve. I have not and I suspect I am not the only G4 member who has not and has no need to. That presentation was no better, indeed was quite a bit worse than many I did and heard in the 1990s where analog phone lines were used in combination with on-site surrogate-operated Powerpoint files, or even overhead slides. Audio arrangements were actually better back then than in this experience, especially for post-presentation questions. Recently 2024/25, previous Vice-Chair Charlie Harper similarly lamented the lousy audio at meetings in a strategic planning overview. How many more decades must pass till this is solved?

Ditto Microsoft Word. Also a software that has many proponents, myself not one of them though I do have and use older versions. Mandating its use for development and teaching the “ASTM procedure” again imposes a learning curve on those (remember *volunteers*) who do not use it elsewhere. And the remote task group procedure was abominable, as was previously noted herein. Especially the tendency to flood Task Force members with scattered comments of little focus. It was like assembling a jigsaw puzzle, ...or perhaps worse there are some chaotic G4 Minutes of meetings.

Has ASTM abandoned its reputation as a respected standards organization to become much more like an on-demand printing company?

Of course, G4 can cope. As noted before, this commentator recommends a return to its former practical method of developing standards as a pre-cursor, to work up an effectively final-form snap-shot consensus then go through a high-speed artificial pro-forma perfunctory conformance with the ASTM Microsoft tyranny. Call it pre-planning. It has worked better than the intrigue and conspiracy this worker has experienced.

Membership/Fellowship Growth

Several comments were received in the previously cited 2014 quality survey to suggest; “expansion of membership”, and “gather more members” (neither comment from myself). The previously cited Charlie Harper strategic perspective a decade later cited as its first observation the small number of members available to divide and conquer. Early G4 always sought to involve every oxidant worker and user possible and even those with prospective or ancillary need to know. More recently the G4 base of not only members but the peripheral audience has shrunk (decaying to almost half its peak level while large numbers were scrapped) and one has wondered if the shrinkage was deliberate to reduce the size of the pond even if that ploy is supposedly unintended. Building membership has always been difficult, losing it was probably much easier.

Upon suggesting the creation of a Thermo-Chemical Equilibrium subcommittee or Task Force in 2008, the official G4 response was that G4 was only going to focus on four core activities for the present (1) offering the education course, (2) sustaining the symposium and seminar series (3) doing minimal mandatory standards maintenance, and (4) wrapping up a limited number of then-current industry funded research programs). This was predicated on extreme pressure competing for member time (the lingering quality revolution, international competition efforts, the 9/11 attack, the housing bubble, the recession) all of which had recently been and long continued to be compelling distractions even at the cost of additional members bringing additional energy and talent. However what is apparently wanted is “attending members”.

G4 is under no obligation to search out these potential members/audiences and force standards into their hands, but I would argue G4 has become far too reclusive (preaching secretively to its member choir, its kool kids) rather than its real audience at large. G4’s standards are voluntary and so collegiality makes more sense than edicts from Olympus. Of course a previously cited concern regarding the desirability that big fish have for small ponds may be a factor as well. Bottom line is that members get to read obscure minutes every now and then and some cast votes once or twice a year out of the blue., ...if lucky. Otherwise they are mushrooms in the dark. Voting members get to cast ballots on standards they have often not seen before, and some have been misrepresented or in crisis while couched in misleading terms. These are small incentives to become members if one can not attend in person and when attempting to listen in on WebEx meetings has been more repellant than attractive.

Alas, this commentator who witnessed and participated in the G4 creation epic and early struggles with this same issue, detailed elsewhere in this document, would repeat. G4 was always high-level people (with a few exceptions like myself) who do not take well to delegation. They delegate, they do not get delegated to. More members are critical but should not be counted on as a source of rank-and-

file labor. Voluntary members will do (and perhaps should do) what they were assigned to do by their company line supervisors, period. G4's current, dare I say prima donnas for context, need to practice stewardship of the small discretionary labor that is donated and be aware it will be small and shrinking. Efforts to seek grants and other mechanisms is more in their bailiwick. Membership expansion, vital as it is, might if anything, make projects more labor intensive.

Membership growth should be considered a vital effort, but not for the purpose of gaining labor resources.

Honorary Members = Free Labor

An example of bipolar G4's reclusion (another to follow) is how it has handled its retirees (myself both included and excluded). In 1989, after a long personal campaign G4 offered a series of honorary memberships to "emeritus" retirees who were no longer subsidized by employers. Several who accepted are still carried on the G4 roster but are for all intents and purposes thwarted from participation. If they are not voting status, then they get the ASTM magazine *Standardization News* which contains virtually nothing I am interested in reading. When I retired in 1999, I requested an Honorary membership, feeling it was wrongful to be charged after 25 years of service to continue to serve and I received what I believe was the only such membership granted since 1989. But my parallel hope was that it would revitalize a precedent. It did not. And my "service" has been largely, perhaps completely unwelcome.

For years (decades) I had tried to maintain cordial contact with retirees dating back to Bob Nearly and Ed Volland (1980s), Some of the giants on whose shoulders we stand today (truly Members Emeritus) whose inputs and commentaries and recollections are invaluable (at least in this judgment). Ideal folks to ask advice of or seek input for draft standards. While some retirees may want nothing to do with their past, some others are highly motivated, even public-service motivated. Nonetheless experience over the years has taught me that many of these highly talented, in some cases ground-breaking, experts still want to be of service as volunteers or even just contacts. I recall seeing a photo in a company retiree's newsletter of retired coworker George Ikeda (early Chair of G4 Practices, and massively experienced retired expert, voluntarily stuffing those newsletters into envelopes to help out). Similarly teams of superb former co-workers often oxygen safety experts designing and building and installing science demonstrations for a local (Franklin-Institute-style museum called The Da Vinci Center). If that is what George or any of them wanted to do, amen, but they should have had the option and G4 should have sought out their labor and valuable words, even if just for a survey purpose. George passed just months ago (2023) after nearly 40 years of retirement and his knowledge was lost forever. And yet poor G4 laments lack of energy. Admittedly today there are huge member egos who think they are God's gift to oxidant safety and appear to be opposed to letting other talented fish into *their* pond.

Having worked with Joe Slusser for 20 years before he became G4's chair (2008-2014?) whose knowledge of metals and their flammability, whose experience in investigating incidents and *WHO WAS G4's CHAIR just before retiring* should have been offered an automatic honorary membership, and yet like politicians in Washington, several oft-repeated suggestions and reminders to G4 leadership were always graciously received, sometimes agreed with vigorously, to be taken into consideration and then either fully ignored or secretly rejected. Things like that have far too easily fallen through G4's rather selective and convenient cracks.

A prime example of an oxidant authority, massively lettered, credentialed, and experienced and a past important contributor to G4 as distinguished as anyone G4 has ever enjoyed having in its ranks would be former coworker and friend James G, Hansel. And Jim was both theoretical and practical, as likely to be solving a ternary diagram for a fire limit or overhauling a diesel engine. Jim's amazing career can be viewed on the net* and exhibits a life-long volunteerism few could match. Only a rather insecure ASTM G4 could not want to nor even bother to court this man in retirement.

On a gretzy day when I am overly pessimistic, I might be prone to wonder if G4's previously cited cognoscente are deliberately trying to exclude anyone who might dilute their own influence in the Committee (i.e. as noted earlier by shrinking the pond so that the big fishees seem even bigger) even as they sustain their lament for lack of labor. But a more charitable if less flattering perspective is to just assume with their oversized egos, that G4's motivation is either nil or clueless.

Symposia/Seminar Series

Early standards from G4, like ASTM standards in general, contained reference lists that provided bases (justification, elaboration, details, etc) for the opinions expressed in the body of the standard. The G4 symposia series was begun in 1982 initially to document existing and generate new and better bases for ethics cited in the G4 body of standards. Opinions, including opinions that qualify as wisdom, are always best when supported by more detailed elaborations that explain or otherwise defend, but at the very least, document the opinion. Oxidant safety wisdom was at that time to a significant extent undocumented. It was organically stored in the memories and anecdotes of "old timers". What's more, in many cases the exercise of documenting one's knowledge and judgment, or of deliberate study or research can clarify, validate, expand and even scale the use of derivative ethics. It can lessen the degree to which oxidant safety ethics are based upon urban myth. It can provide a mechanism to identify gaps and generate ideal methods to create, expand or improve G4's specific ethics or entire standards. It can allow competing even conflicting ethics to flourish in context. Symposia/seminars are good things!

The early symposia were very successful but very difficult to administer and to supply with content. A seminar series was launched to increase content and ex-

* s3.us.east-2.amazonaws.com/mww-milestones/Hansel_James.pdf

panded to allow spreading the administration out as a means to reduce massive demand on the limited base of contributors and managers. As of this writing there have been sixteen symposia and perhaps even more seminar opportunities that produced sixteen volumes of Special Technical Publications. About 395 papers have been presented in the first 16 symposia. In this workers opinion this has been a “two edged sword”.

In numerous cases, data have been reported that have made standards more useful and in some cases possible. Many ethics have been analyzed, tested and better understood. And the context for G4’s body of work has grown. This seems to have been more so early on, and more recently it appears that content has taken on a much more academic rather than practical nature. In some cases there appears to be little practical benefit to some content even in cases where the content is entirely appropriate and therefore welcome.

In this judgment, whereas early symposia content was often crucial to the development of standards, more recent symposia have had little immediate benefit to rank and file oxygen system workers. It seems that often the reasons and value for some papers is rather esoteric. Perhaps some merely inflate CVs, and at least one was a badly conspired intrigue.

G4 does not appear to have any mechanism to systematically exploit or extract potential standard’s content or dissent from its symposia/seminars. At present they are scattered about on an ASTM Website that offers them for sale. This worker for about a decade generated a composite Bibliography of all identifiable publications within or outside the G4 forum as a PC utility file (.doc and .pdf formats) to aid generating papers and reference lists by authors of new papers but also to search as a cryptic database. The fifth and last revision in 2005 contained 2332 references when the Committee retrenchment made further revision impossible. The last version does not appear to be readily available. Today G4 requires its customers to cope with the less than optimum ASTM website to shop for documents. At a minimum a compilation of all G4 STPs with full bibliographic data, a list of paper titles and possibly even abstracts from the papers should be made available as a “quality” PC Utility file service to G4 members and the oxygen safety community including G4-at-Large. But the G4 Reference file should also be resurrected and expanded to contain abstracts (committee written where copyright issues obtain). For this website an unvetted searchable complied listing of the papers (not abstracts for copyright issues) in the STPs associated with symposia was generated [***23***] and the those papers in symposia since 2005 (about 120) were added to the larger G4Ref14.doc bibliography as Ref150426.doc [***24***] and both can be downloaded.

Unless these symposia papers are being used solely to fatten CVs, G4 should also adopt either a conscious effort to appraise every paper for possible impact on the G4 Body of Work, and possibly add as a requirement a heading for authors to propose the purpose/impact of their paper on the oxygen safety community.

In the same way there is a keynote address at many symposia with among the keynote possible functions being (often preferred) commentary on G4's operations and needs, a subcommittee or perhaps the volume editors should be assigned to present a paper at every symposium on where G4 stands with regard to the incremental papers in its own forum but perhaps also in external publications. These products can serve not only the oxygen user community but the G4 community as aids to identifying needs for developing or modifying standards.

Peer Review Corruption

"Yes, peer review has serious flaws but, by golly, it is the best system we got." This worker has heard this sentiment cited and implied in various forms till it makes this worker want to puke. I conclude it is quite simply a malicious deliberate lie. There is decades of indictment of peer review processes and abuses documented. One can do an Internet search for peer review abuse, especially during the COVID travesty, and of even the most prestigious implementations that suffer severe flaws. As if basic human nature, the flaws all seem to exemplify Lord Acton's warning. Of course not all peer review systems are equally bad. However, some like ASTM's and G4's implementation of it stand out.

The ASTM G4 peer review implementation is a very hot (perhaps too-hot) button issue with this worker due to personal experiences. In my judgment it is deplorable and has seriously disserved its audience, and inasmuch as G4's mission is a safety function (save lives/injury, capital and mission) the G4 peer review process has encumbered, interfered with and even prevented some of its most important functions. In my personal experience, it imbued me with nemeses (I call them the NASA+ herein) among my fellow committee members that defamed me in my employment, and interfered with the good works of the G4 committee, and in the worst case seems to have sentenced me as the pariah I seem to be today.

In my humble opinion, my judgment is that for a rather long time, the NASA+ cognoscente (as defined earlier) within G4 has exercised improper, ineffective and, perhaps worst of all, undue influence, has (whether deliberately or imperiously) imposed its own perspective on an ASTM defined-consensus with no push back from ASTM or the non-NASA+ members of G4. Sometimes such civility does not serve one's customers and can be destructive (and harmful in lawsuits).

My case study [***11***] details how in my judgment G4 has become focused on esoteric sophistry, while disdaining its more mundane yet more fundamental, indeed critical, duties. This seems to be the case even if there is an absence of any overt plan to misbehave. G4's cognoscente may even think it is doing a noble service by censoring data that in its ruling opinion is "misinformation." While that may be a workable system when used within its originator's communities where line organizational (line) authority may exist, it has disrupted the (staff) G4 mission.

I am not alone in finding fault with NASA-at-Large (recall the aftermaths of Challenger, Columbia and most pertinent to G4, Apollos 1 and 13) and its NASA+ sphere of influence despite the politeness in ASTM G4. Apples fall under the trees.

My own painfully long and detailed case study defends why I conclude, in my judgment, that G4 went though this subversion of its mission that includes its publications. With regard to a focus on peer review, I conclude, my judgment is, that the long term lead Editor (possibly assumed position rather than assigned position) of G4 publications since 1997 (Dr. Ted Steinberg) should be thanked for his efforts but removed from that position as it not only dilutes the POP (Publish Or Perish) status that he values so highly, but also his own many efforts with not only the appearance of impropriety but allegations (including my allegation as elaborated separately) of factual impropriety to the effect that the position has prevented (interfered with and censored) critical evaluation of his own works. As noted elsewhere the G4 organ has for all these reasons the appearance of being a self-publication vehicle for his own and his disciple's CVs (his current Google Scholar mid-2025 listing has about 80 papers that he was the “lead” or dominant editor in the ASTM/G4 peer review process). And in this opinion, Dr. Steinberg’s editing of his own work has been tragic.

Early G4-at-Large knew that a large fraction of practical oxygen safety knowledge was vested in rank-and-file front-line workers whose academics were often from the school-of-hard-knocks. They didn’t conduct experiments or contemplate about angels on the heads of pins for a living, they twisted valves. Hence their knowledge had to be coaxed and teased from them and even supported. For these folks publishing a paper could be onerous and unrewarding. Doing a paper was a noble sacrifice. Hence the early Committee adopted a no-fault sense of the Committee posture to encourage, support and mentor papers from all these diverse resources. That included discouraging peer review rejection based on technical reasons that were debatable. This was in part inspired by what Dr. Steinberg and associates had alleged was unfair treatment of *them* by a prestigious publish-or-perish (POP) journal peer review of a submission, a submission this worker believes today *was* rather flawed. Peer review was to support and help and even heretical commentary was welcome since there were oftentimes conflicting perspectives on oxygen safety practices and early G4 wanted to explore all of them. Dr. Steinberg unilaterally changed that in a way this worker considers harmful.

Since roughly 1995, a subset of G4 (with several heavy-duty academics) decided to and has replaced that process with a sustained POP-style peer review. Since then a greater fraction of very academic papers (that are and should be welcome) has been manifest and a substantial reduction in practical-knowledge papers has resulted. It is unconscionable to effectively exclude these other resources. At the same time peer review labor has been onerous and lamented.

A “proceedings” [***11***] in the words of ASTMs 1997 COP Chairman and the elimination of the peer review process should be adopted, with instead rebuttal and/

or context commentary applied to heretical papers. At bare minimum a parallel publication route should have been established and an outreach should be launched to lure contributions from those who do not seek academic stature or CV heft yet whose shunning is a disservice to the oxygen safety effort and community. More importantly whose exclusion from the G4 collegium is harmful as is alleged herein.

Suffice it to say in this judgment and opinion for the bases addressed here and within reference [***11***], G4 peer review has been used to censor questioning of the NASA+ supremacy, and yet has also been used, in this judgment, to publish flawed materials from within the supremacy for the purpose of manipulating G4's standards content.

The NASA+ cognoscente has in this judgment failed to avoid not only the appearance but the fact of impropriety. It may not be among the worst of dictatorships but as I have noted it has fallen far short of being good and has had serious negative consequences.

I offer this section and supporting bases due to multiple personal experiences covered in painful detail because I fear those bases are far too resemblant of the ASME Hydrolevel problem, in which a clique within its committee's cognoscente took it upon themselves much as NASA+ has been doing, of substituting the views of the few for those of others often on the foundation of a defined consensus and in spite of spirited dissent. Perhaps that will insulate them from antitrust and lawsuit issues, but they have certainly gambled a lot on it. ASTM disclaims antitrust issues at many, maybe every, meeting. Would the events at ASME have been fully acceptable if such a disclaimer had been a-priori worked into their system and the same result had been manipulated? Would ASME, indeed would ASTM, have cared what happened if they had avoided the judgment? Is ASTM and G4 flirting with new risk here greater than that of distributing vetted fully disclaimed software?

Education May Need a Critical Audit?

G4's education course is its biggest sub-pond and has been its crown jewel. The student head counts are not boasted about (maybe they should be) but they broke a thousand several decades ago. The last I heard students seemed to love the course. To my knowledge, since I have passed on the Education chair in the 90s, the G4 course has been operating with a high degree of autonomy. That is not necessarily bad and may have been a factor in why it was able to achieve such impressive early and on-going results.

However, when one considers how predictable human nature has led to what I consider to be the NASA+ undue influence in the main committee, one has to wonder if the same undue influence has infiltrated the reclusive education course. Many of the same people are involved. As detailed earlier, the NASA+ clearly believes it is top gun on all things technical (not without some basis, but not

exactly accurate either). The self-appointed SGRs, the scary smart, the cognoscente, appear to be in charge. There is no smoking gun here but there is smoke.

For example, indeed, at one point NASA assembled it own oxygen safety standard. *Safety Standard for Oxygen and Oxygen Systems*, NSS 1740.15, January 1996. Soon thereafter it was advocated for adoption as the G4 education-course CourseBook, but was not a balloted G4 product. It would be converted into an ASTM *Manual 36* (©2000) and revised in 2007. After it was balloted, it became a resource included in the Education course supplemental materials because of the scale of the effort from a leading noncommercial source. However, it was not a consensus perspective, it reflected the NASA perspective not withstanding a substantial amount of overlap between those two perspectives. It is something voluntary oxidant safety workers should have access to and may wish to and often should consider, but it is not irrefutable, nor gospel, by any means.

Since the 2007 revision, it has became an award winning product (partly due to its inclusion in education course materials). And yet both editions have non-consensus flaws in this opinion (in this "peer" review) and while NASA+ may feel it should be the oxygen safety communities gospel, this worker disagrees. Both editions present the NASA+ perspective that is entirely appropriate to hold and share but should not be shared out of context with other opinions. Indeed NASA and NASA+ are very talented people who, whether they realize it or not, may feel they should be allowed to specify safety practices and in this opinion tend to gravitate that way. But they are *not* perfect and need to know that and "**The NASA+ 800 Pound Gorilla**" [***9***] provides details. This worker concludes that this assembly of recognized and/or subliminal extreme self confidence (perhaps ego and arrogance) has decertified this worker as an effective member of the G4 designated consensus. I am *effectively* no longer allowed to participate. I am only allowed to be background noise. That has been bad for me but may be really bad for G4, ASTM, and some culprits within the NASA+.

And so G4 education may indeed need a critical audit. If it sustains student polls after every course, those comments should as a minimum be screened for dissent. Dissent needs to rank the way negative votes used to in standards ballots.

G4 Outreach

In the past and in recent times this worker has gone onto Google and typed words like "oxygen fire safety" into the search engine. A bounty of safety information erupted. None of it related to G4. What seems clear (if it is not fake news) is that home medical oxygen is producing a plethora of death. A web site claimed an oxygen-fire related death was occurring every two or three days. If so this *is* a real crisis. Apparently, during COVID a facility in Iraq experienced an oxygen fire that took 82 lives. A year before that an awesome blast in a Sanmenxia China air sepa-

ration plant killed 15-24[4]. G4 should be smarting from this news and reaching out beyond its membership although this is not to suggest G4 should market its standards to ailing home oxygen users, though some user-level effort outreach based on the G4 mission makes sense.

Similarly searching for "ASTM Committee G4" brought forth nothing that G4 should be proud of. Indeed G4 should perform this search in a meeting to illustrate to its cognoscente how pathetic the external perspective of it is. Thanks to the precocity of member Dwight Janoff in the 1990s G4 had a rudimentary website run on the WWW from his own PC at NASA-WSTF for years that made it seem G4 was cutting edge. Today it has nothing. Even this worker's personal website *BWOpinion* that ran through roughly 2000-2010 (untill his ISP made it a hassle to continue) provided more info. It does not look like G4 is trying or even wants to try, ...and maybe it does not. Indeed, a search for related videos on YouTube is similarly ungratifying. G4 needs a public outreach website and at least one introductory video.

The so-called Committee website areas within the parent ASTM Website seek to describe G4 to outsiders in one case and provides Committee operating data to actual members in the other. Neither appears to be creating nor capable of creating much interest as to outreach to oxygen users. Occasional articles in the ASTM organ "*Standardization News*" again has a membership appeal limited to ASTM at large. Outreach efforts in the deep past produced precious little outreach. A newsletter in the spirit of transparency and outreach was scrapped long ago with little remorse. That is G4 today.

G4 is obscure in today's world and does not seem to care, indeed, its attending members seem to meet in scenic sites, take tours, chat, publish (perhaps vanity publish) esoteric papers for their CVs, and seem to want obscurity. That may seem a harsh assessment, but much worse could be said. G4 needs to resurrect its Newsletter (without making a big deal of it), launch a modest website (without making a big deal of it), and probably could benefit from a YouTube video (without making big deal of it). None of these things are Herculean efforts in today's world.

Gaps

In the mid-1990s, G4's basic body of work (BOW) was looking pretty good. Almost all of the oxygen standards in its current jurisdiction were in place, the education course was thriving, and the symposium series was successful but struggling with a short supply of papers and peer reviewers. What was left to do?

A "gaps" document was launched listing specific topics or standards efforts

[4]Details of the Sanmenxia explosion are not clear. It appears to have involved a LOX/aluminum explosion. However, there are two schools of practice for aluminum. Some past incidents [***25,26***] have employed aluminum on the valid predicate that its ignition could be prevented, but if so clearly operation may have been its direct cause. Other practices seek to prevent propagation, but if so such design may be been its direct cause.

or whatever that anyone thought G4 should undertake. Since G4 was a voluntary organization, perhaps some volunteerism could be solicited and inspired and targeted and diverted to specific gaps in the BOW. But it was also pertinent if G4 felt it should waive off on any topic as waiver of work (WOW). A series of gaps was identified and for a few years, a few papers were cajoled that filled a few gaps. But many remain to this day, perhaps some from that original list.

An obstacle to filling gaps as well as outreach is that the ideal mechanism for identifying and filling gaps is the submission of a paper and yet the G4 Peer Review system discourages many potential contributors/commentators. As noted earlier, the present G4 system treats papers like eager submissions from academics champing to publish and who need to be policed to avoid bogus CV inflation efforts. Indeed, in the last 25 years there have been about seven symposia that generated about 180 papers, and they do lend the appearance of academia rather than a collaborative oxidant safety community ...at least to this worker.

At that time, this worker was about five years from retirement, and so his associates were surveyed and a list of more than thirty topics was assembled, many very practical based on often unique corporate experience and research. About six were cajoled from optimum practitioners within this worker's community [***27-32***]. Then came "**A Brief Study**..." [***33***], a paper this worker stands by to this day, that received remarkably extreme negative peer review, of the exact kind G4-at-large had sought to discourage as unwelcome. Substantial intrigue ultimately prevented its inclusion in the G4 forum. However, the energy and vitriol that it spawned was stunning. Questioning the mighty and infallible NASA+ was like touching a hot cigarette to an anaconda. But a following very practical paper had also been submitted [***32***] and it was peer reviewed by one of the same NASA+ reviewers as for [***33***] and it drew comparable unwarranted overflow vitriol. My Coauthor whomsoever I had assured would be doing a great service to the world in the warm nurturing ASTM G4 community was suddenly recipient of really nasty peer review that effectively accused us both of gross incompetence. That peer review from a university professor emeritus was ultimately proven to be a petty effort at peer review manipulation from a NASA+ ideologue and with great effort the paper published but the damage done was irreparable. The G4 and ASTM peer review process proved deplorable (and yes that is this worker's peer review of it) [***11***]. At present it is not "flawed but the best we got". It is counterproductive and failing to serve G4's most vital needs (saving lives, injuries, capital and mission losses). It needs to be scrapped and replaced by something consistent with the needs of a voluntary consensus collaborative standards organization.

The forum was poisoned. This worker's credibility for cajoling and soliciting, even extorting, papers from coworkers was history. I was able to obtain a few more presentations but none were submitted to the G4 peer review process. In the 25 years since I have retired I have seen few papers, maybe only one from my list of more than thirty, either presented or published in the G4 forum or anywhere else. A major loss. Many of the optimum authors are not only retired, they are gone.

For more than two decades, the influence of the NASA+ clique on the G4 forum has been far too much like scholastic vanity self-publication with far too little focus on oxygen users. The early gaps effort was apparently lost when G4 retrenched in the 2000s to focus only on it four main efforts: standards maintenance, seminar and symposia activity, education course, and wrapping up on-going industry sponsored testing.

Recently (2024) the new Strategic Planner (vice chair Charlie Harper) has written his own assessment factoring in the 2014 quality survey and it includes a gaps effort as well as several more of the same kind of gretzings cited here. His vice-chair has now timed out, and his or other efforts are less clear.

A few examples of prior gaps are in order. Ideally, every opinion/ethic cited in an oxidant safety standard should cite a more detailed discussion to allow follow-up. G4's ethics are not proclamations. Numerous safety professionals I have known have endorsed the concept of citing safety ethics in concert with supporting bases. That is to say do not issue safety maxims without explaining why they are important in context [e.g. "Do not open valves rapidly, ...as rapid pressurization can produce extreme heating and ignition"]. In one ancient incident a night worker was cleaning up an idled plant in the spirit of safety instead of watching an idled reactor temperature also in the spirit of safety. He had not been told to keep the plant clean ...something that prevents tripping hazards, and to keep the temperature down, ...something that prevents blowing the plant up. The reactor ran away while he was cleaning floors and an ensuing fire burned the plant to the ground. Complete loss. Both efforts were duties but they were of unequal urgency. G4 should audit how well the ethics in its BOW is supported by bases *and* a separate reference when available. Wherever a bases is found lacking or scant, a gap is discovered that needs filling.

Another example: is the oft cited hazard of LOX spills on blacktop and maccadam. In the mid-1990s when the gap was first flagged in the gaps listing, Coleman J. Bryan stepped up to describe a test at KSC where some blacktop or macadam was put down then flooded with LOX and ignited. Bryan cited the explosion as being heard all the way over in Titusville. Unfortunately, documentation could not be found to support a reference paper. This gap apparently still obtains. And spillage of LOX onto blacktop is still really good to avoid.

A third double-gap example, in this opinion, to repeat past gretzing, G4 has stressed one of two ignition parameters (ignition temperature) but is virtually devoid of discussion of the other one: ignition energy (IE). Both Min AIT and Min IE must be achieved to enable ignition and this necessary but not sufficient condition that is not disputed should be introduced in G128, elaborated upon in G63 and G94 and G88, as well as integrated into G145. However, this factor was broached, *by this worker*, in 1993 and a proposal to deal with the gap it poses in 2007 about two decades ago, then reiterated in 2014 along with another offer of voluntary energy needed to accomplish it, finally endorsed by Barry Newton in a OSSS presentation

in 2017, but it slipped through the cracks yet again. Oops!

This dissent also contributes (actually repeats a few) such topics but makes the strong point that the most serious dereliction in G4s body of work is the complete absence of a thermo-chemical equilibrium initiative after more than two decades of intransigence [***14***]. As noted earlier TCE theory is also not speculative. It is mature science crucial to many fields and its potential value is forecast clearly in this perhaps less-than-ideal commentator's (pariah's) many efforts during the past nearly two decades, despite any errors and indeed possibly even jumbo errors those efforts may have produced. If G4 needs to learn this "new" material then a curriculum needs to be launched.

These gaps are among many others and yet at present, G4's minutes have contemplated three new standards by the NASA+ cognoscente. Based on those Minutes of Meetings, one is on Filters (an ancient request that often comes back to haunt), one on "compliance" training for G4 standards (perhaps a badly misused word), and one on material evaluation (i.e. hazard-review) procedures. All three of these are in this view ill-advised and are examined in a later dedicated section

Estate Planning

This worker worries if rumored NASA budget cuts (which this decertified consensus member supports) and their reflections will force retrenchment of NASA+ workers on G4 and whether in light of the other problems cited herein, it might mean the end of G4 effectively or in fact. Whether that is fanciful or too realistic, G4 needs to do some estate planning. What happens if G4 faces demise or the loss of a majority of its operating energy (misguided though I judge that energy to be at present).

In this regard several of the criticisms herein may be prescient. If G4 had expanded its scope as foreseen on day one, the need for G4 spread much wider might have allowed some leverage to sustain a reduced level of operations. Either way, are the symposium series and seminar series lost? Is the education course shut down?

Can further retrenchment allow standards maintenance to be continued even if just using conferencing software should any energies be retained. Earlier suggestions regarding compilations and more durable standards apply here again. Can anything be converted into manuals (in other words, permanent standards) to serve the same need even with a pruned committee or no committee. G4 should not assume it is immortal. It needs to ask itself a crucial "what if" question: where would oxidant safety stand tomorrow if G4 disbanded. An estate plan needs to answer that question.

Closure to Admin Commentary

G4's work is extensive but not nearly finished. And yet its ongoing, lingering retrenchment, stagnation, mutiny and reclusion make it seem like G4's current generation may want to pack it in or worse. For various reasons explored herein, the Committee's production has dropped and not just because a large fraction of the oxygen effort is complete. That drop was at least in part intentional, perhaps strategic. A similar long term drop in membership may seem like a fatal omen. It may be rats deserting a sinking ship? Or sabotage? Or has G4 merely become boring? Should G4 retire even before its work is done? Should it put itself out of business before someone else puts it out of business?

As of this writing, ASTM Committee G4 has been active for 50 years. I believe its current generation is poorly stewarding a compelling body of work that can and likely has advanced its three prime goals of (1) saving lives and injury, (2) saving capital, and (3) saving mission. But the job still has a long ways to go. Perhaps to some extent it has been picking the low hanging fruit. A wise choice to improve early yield where the payback is greatest and quickest. But potentially hard work still remains and G4 is not doing it. In this view a majority of that hard work is not just in extremely esoteric academic-based research.

Unexpected (and unwanted) Incidents, even big ones, have continued to "happen" and some may not be preventable in any practical way. There are historical unexplained incidents, even clusters of incidents. And doubtless the known knowns contained in the BOW could save more with better wider application. Quality principles push "continuous improvement." And since oxygen fire safety is not fully settled science, there is plenty to do. This worker fears for yet another NASA comeuppance he calls "oxygen roulette".

What may be needed, and what is presented here is push-back. But just how does one best push back on the playground? How does one punch the bully's metaphorical nose but (in most cases) not his windpipe?

This expose' laments issues. These issues are being archived here. It would be better for them to be addressed in Committee G4 but they have not been welcome. This messenger, this bearer of bad news, has curiously also not been welcome in the second or third generation Committee G4. Why? This worker (a.k.a designated volunteer) has populated nearly every position G4 has. Chaired and edited the first symposium and its proceedings. Wrote the first draft course book and major portions of more than half of G4 standards, wrote/co-wrote and presented nearly a dozen papers, conceived and prepared a newsletter for nine years, and coded four versions of G4's now-withdrawn utility software and more. He is G4's second Award of Merit recipient. How did this member fall so massively from grace? He believes it all began when he presented a paper challenging NASA+ excess oxygen work and its wunderkind Dr. Ted Steinberg. That saga is discussed and the challenge is defended in extreme detail in [***10***], and the equally grim peer

review effort to suppress it in [***11***]. NASA+ does not suffer fools like this one kindly.

So what volunteer efforts did this worker attempt to contribute during the second half of G4 operation and the majority of his concluding retirement. A sampling:

- 1995 Through 2010. At least two or three negative ballots on an ill-advised change in the burn criterion for ASTM G124, all ballots of which were then withdrawn and the negatives scrapped and ignored.

- 2000 A proposed draft standard to help analyze fire limits using and simplifying universally disliked ternary diagrams with a functional PC utility to simplify the analysis. A blue ribbon panel was embodied to evaluate the need, they may still be evaluating (though some have died).

- 2003 A revision of G88 from four to 20+ pages. It survived substantial hostility to incorporating new material that was proposed and ultimately validated.

- ~2005 Submission of proposed text for a standard for Oxidants Other than Oxygen. Ignored.

- 2008 An effort to follow up on an earlier 1992 NASA+ suggestion to deploy thermo-chemical equilibrium theory and software. A standard based on thermo-chemical equilibrium profiles and data (like references [***14-21***]) were suggested, to include PC utility support to extract data. G4 leadership was not interested.

- 2008 Proposal to improve affordability of G4 products. G4 leadership not interested.

- 2010 A negative ballot on yet another try to revise the G124 burn criterion based this time upon NASA+ experimentation (that this worker considers is invalid and sloppy, plays fast and loose with data) contrived (actually intrigued) to support the change. My negative ballot found not persuasive in part because the subcommittee claimed not to understand G4's standard G125 upon which G 124 was based and in part due to the sanctity with which NASA+ viewed the NASA+ opinion. The vote passed on the last day of a meeting by only 6 remaining NASA+ attendees of the sub and only ten remaining attendees of the Main. These clever yet unseemly political machinations were followed by a paper

[***34***] to “spike the ball” that alleged the reduction of the criteria was actually a “favor” to industry. Bah!

- ~2014 A proposal to cite in G88 two new ignition possibilities for unresolved historical nightmare and cluster incidents [***35,36***] patterned after the speculative way NASA+’s unproven “flow friction” surmise is presented. A NASA+ member argued it must first be approved by a NASA physicist. That physicist is apparently still evaluating.

- 2014+ Repeated suggestions that retired prior G4 chair Joe Slusser among others be offered an honorary membership, always agreed to, never done. Lately Slusser seems no longer interested. This worker employs the “better to ask for forgiveness than to ask for permission” ethic to keep him informed in the spirit of ASTM “transparency”.

- 2014 A repeat seminar series proposal (2014) to launch a themo-chemical equilibrium standard based upon exploratory works [***19***]. Fully ignored. A NASA+ member implying they already use it on occasion appearing to suggest a standard was therefore not needed. No action.

- ~2015 A proposed series of revisions to ASTM G 145 on incident investigation (including the need to address minimum ignition energy issues first broached in 1993 and later in 2007)[***38***]. Another member was said to also be planning some revision proposals and so the plan was to hold it in abeyance and wait for them. Nothing done since. Wait now in year 11.

- 2021 Negative ballot on G94 about the hazards of aluminum allowed to be withdrawn at the request of the G4 leadership so the standard could publish and so that a Task Force could be formed to address the issue. It is now 2026 and it appears no Task Force has been formed but the regular five year review is once again at hand. Perhaps like so much stuff, it has fallen through G4’s many. many cracks.

And there is more. This worker is no longer privy to what goes on in G4’s *transparent-not* smoke-filled back rooms and perhaps that is of most concern. Of equal concern is what this list shows is NOT going on in those back rooms.

Future editions of this protest are possible but uncertain in likelihood. Several PC utilities can be revised and some new ones can be coded [***13***]. There may remains a need to even further bust the myth of excess oxygen in burning steel slag and there appears to be a definitive way to do that [***10***] that might make an in-

teresting YouTube video. Perhaps a video on the 2010 G124 ballot intrigue. And still other videos, perhaps potential video seminar topics on oxidant safety topics or oxygen safety community critiques, may be worthwhile ...and all available to the whole Committee and world at large as transparency. This worker is not optimistic.

Section 4

G4 Standards to Which I Dissent

Several of the cited supporting commentaries have been documented as early as the 2000s and several new commentaries are covered further in linked support sources.

G 128 Control of Hazards and Risks in Oxygen–Enriched Systems

An abstract standard introduces the Committee and it work and delineates how the committee with jurisdiction addresses its mission in the context of the external world. Every standard under G4's jurisdiction should be listed and its abstract purpose cited. Relevant outside related materials should be cited. In many ways G128 and the G4 Education course textbook overlap, and G 128 should be evaluated and perhaps fine-tuned to see if it can succeed and supercede the existing course-book. G128 needs an audit in this purpose specifically to ensure it covers every one of its standards and adds apparent new material:

A context is needed for the "consensus" of each standard and its "dissent' (to say reception) should be noted. Also:

Clusters and nightmares (or alternative descriptors) need introduction [***8***].

Min. ignition energy needs introduction as well as its role vs min. ignition temperature needs clarifying [***38***].

Thermo-chemical equilibrium needs introduction [***14***].

Thermo-physical properties data (NIST) needs introduction [***13***]

Computational fluid dynamics needs introduction [***13***]

Flow friction speculation needs context (see G88).

Cosmic ray and tramp atom decay need intro/context [***35,36***]

System aging overview needs introduction, perhaps new or resurrection of the overview materials in the original standard (now

deleted, see original G114)).

Oxidants other than O_2 need brief introduction and context [***40***].

Use of computational software needs introduction [***13***].

Many if these topics appear to be more than a decade overdue.

G 88 Designing Systems for Oxygen Service

G88 needs selective elaboration of all the relevant new topics listed in the G128 dissent above. Again all appear more than a decade overdue.

G 63 Evaluating Nonmetallic Materials

G 63 needs selective elaboration of all the relevant new topics listed in the G128 dissent above. Again all appear more than a decade overdue.

G 94 Guide to Evaluating Metals for Oxygen Service

G94 needs selective elaboration of all the relevant new topics listed in the G128 dissent above. Again all appear more than a decade overdue.

The aluminum conundrum [***20***] (subject of a 2021 negative ballot) needs elaboration.

G 114 Aging Oxygen–Service Materials Prior to Flammability Testing

G 114 started out as an overview standard (something of a sub-abstract standard. In the 2000s a revision converted it into a polymer test method then expanded it into useless futile metals testing as well. Its present status may have changed again but right now there is an ante of $83 for one to check it out. Its context needs auditing. The original materials need to be returned to G 114 or into a new overview standard or else installed in G 128.

G 124 Determining the Combustion Behavior of Metallic Materials in Oxygen Enriched Atmospheres (G94 Support Test Method Standard)

G 124 is currently unfit for use [***1***] due to an invalid burn criterion. G 124 is the most controversial standard G4 has ever produced. Since the early 1990s, two schools of thought have emerged. This worker has always made the case for pat-

terning metal fire limits upon centuries of practice for gas phase fire limit testing. This perspective held sway from the G 124 launch until 2010. And in the spirit of compromise I supported a second standard or a second variant so that divergent voluntary users could opt for the positive burn length criteria they wanted. I also suggested methods by which a shorter burn criteria (though definitely not 30 mm) might be validated, *if it is possible though it is highly unlikely to be possible to validate 30 mm.* The saga of these efforts is reported extensively [***1***].

However, the "short-burn criteria" advocates wanted a mere substitution of a short criterion to be plugged in and went to rather extreme (i.e. frankly sleazy) political lengths to revise the standard. Short burn length criterion allows less costly testing but apparently more importantly allows the "official" testing of specimens in NASA+ drop towers to claim conformance which with only ~2 seconds of drop time is not enough time to burn a complete specimen of 150 mm length. And in characteristic fashion, a subsequent publication [***34***] suggested the ill-conceived change was actually a service to industry. What incredible arrogance! Indeed as a service to NASA, this worker suggests an even lower criteria so that in service to them they can improve their own safety by building the Artemis LOX-tank out of gold or at least copper, rather than the current aluminum. So glad this worker could return the favor and help those guys out on that.

G 124 needs adoption of a valid burn criterion.

G 93 Cleaning Methods for Material and Equipment

An ~2025 ballot for a G 93 revision was issued. The required rationale statement was configured more like a friendly boasting about how wonderful the revision was than the bases for the revision. And the revision was quite large. So large that this one's "lights started flashing red", especially when the rationale appealed against negative votes. Suddenly this worker flashed on a past rationale statement that assured the committee's mushroom members that the ballot was just a re-approval plus a few long-overdue changes but made it unfit for use. Move on, nothing to see here. Where one of those long overdue changes was the (despicable) stealth change in burn criterion that decreased the "official" fire limit of 300-series stainless steel from 500 psi to 200 psi and the limit of Inconel 718 from 1000 psi to 400 psi as a service to industry (see previous topic). This worker did not vote negative (negatives don't mean much these days anymore, they just inflict delays on the inevitable), but I did dissent to the entire ballot. Even if not sinister, the changes seemed upon several readings (yet not nearly enough) to be more cosmetic, changes for the sake of change and marking of territory.

But this worker does dissent to the technical content in the current G 93. At least two things were not addressed that were speculation, or possibly proprietary, when G 93 first published:

> *Supercritical Fluid Extraction (SFE)*-Carbon dioxide SFE was well-established in the 90s and has been used for "cleaning" as well as ex-

traction. Furthermore the method has particular appeal for cleaning systems that have blind regions that are difficult to expose to cleaning fluids. Yes, its applications are limited, but where they can be used, they can be mega-effective. And any patents from the 90s (when G93 first published) would now be expired. Numerous internet sites provide adequate description. Was the apparently ASTM–Mandated revision task force totally clueless of this? Tragically, this was one of 30+ topics this worker was pursuing for presentation in the G4 revitalized [***37***] seminar series in the 1990s that were lost not just because of patent concerns but also because of the hostility exhibited in several NASA+ peer review rejections from the NASA+ coalition that successfully sought to censor other papers.

R*eactive Gases Cleaning (RGC)*-Dilute amounts of highly reactive fluorine gas in mixture with argon or nitrogen is well-established and well know and vital to the commissioning of fluorine-based gas systems. The process is called passivation and is often described to include surface metal chemical changes that help prevent ignition but are also important to a large extent because it reacts any residual surface hydrocarbons left by even the most scrupulous prior cleaning. Similarly, ozone behaves the same and upon purging into an oxygen system can react the worst contaminants (including hydrocarbons) into largely CO_2 and H_2O (perhaps CO) that can be purged from a system and like supercritical cleaning can have better access to bind passages and inaccessible regions. And again was yet another of the 30+ topics this worker was pursuing papers on in the 1990s also lost not because of patent concerns but because of the hostility exhibited in several NASA+ peer review rejections from the NASA+ coalition that successfully sought to censor other papers.

Neither of these methods is secret. Needless to say this worker does not consider the G93 revision nearly as impressive as the ballot rationale proclaimed.

Finally, if the apparently cosmetic changes were just to mark territory rather than to sneak in some subtle distinction, the standard should contain a statement to that effect up front.

G 145 Studying Fire Incidents in Oxygen Systems

G145 needs selective elaboration of all the relevant new topics listed in the G128 dissent above that it may be missing. Again all appear more than a decade overdue. The minimum ignition energy modification suggestions were proposed in 2007 (two decades ago) and were repeated yet were held up and are still un-addressed [***38,39***]. Perhaps they are being evaluated by some very slow NASA physicist?

Section 5

Absent Standards I Dissent To

Suggestions for these specific new standards builds a case for dereliction in G4's operations. These five potential products and derivatives thereof contrast to the three current adoption efforts opposed in the next section (filters, education compliance, and hazard reviews) G4 leadership has claimed it is pursuing for several years.

Control of Hazards and Risks in Oxidants Other than Oxygen

This worker proposed a draft standard text [***40***] in the early 2000s when there was significant NF_3 activity in G4. Active members indicated they might just consider the sections on NF_3. The NF_3 activity was soon scrapped and the draft and all other efforts towards a standard went nowhere. However it is and has been a worthwhile topic needed for nearly 50 years and an obvious fit for the G4 mission as well as a founding goal.

G4 may not be as deep in expertise for other oxidants as it is for oxygen, but it is sufficiently qualified to proceed, even if its effort ignores [***40***] or must be "provisional" for some period. Indeed effort might draw new blood into G4 from new resources.

Computer Algorithms for Oxygen System Safety Analysis

The widespread use of software for so amny things is an entrenched reality and artificial intelligence may soon multiply its use. Oxidant safety is no different. Furthermore the use of software for oxidant safety is not merely akin to use of word processors to facilitate typing or calculators to facilitate four-function math. Numerous nontrivial and quite complex mathematical operations are oftentimes employed and botched even by highly lettered workers. G4's standards seek to reduce these risks by including such standard tools of the trade as graphs, figures, and tables that are often generated with computer software. Hence software is not different in its need to perform.

It is beyond tragedy to think of the work G4 has done to help customers and

clients and schools and others to improve their ability to use oxygen safely and to think that G4 worked for decades to write the standards and document the ethics of safe oxygen use and that a customer/client/student/might die because they blew a polytropic equation calculation when a much more reliable (even if not perfect) software based calculation was possible, mocks the whole concept of tragedy.

The ASTM's aversion to developing and distributing free computer utilities as was practiced in the past, and G4's too-obedient compliance, was in the early 2000s. That was two decades ago. Since then attitudes may have matured and certainly should have changed (perhaps not among software companies who wish to commercially exploit such products). However, I repeat, G4 public-service mission is at root a desire for 100% safe use of oxygen and other oxidant chemicals). It is insulting to argue that just as G4's talent deals with these dangers on a daily basis, that it is unequipped, incompetent even, to deal with the challenges of software use, while ASTM-at-large mandates some software use and even sells software. Smell test failure alert! Perhaps G4 should consider selling software if that is the real issue.

"Do not pressurize systems rapidly." "Clean systems thoroughly." Use fire-resistant materials." These are the kinds of guidance G4 gives routinely. They are not trivial. And these are delivered to the highly lettered and the rank-and-file alike, and may be most needed by both extremes. To abandon them to polytropic equations, Raufson's descents, Computational Fluid dynamics, Bernoulli's and Euler's equations, Frank-Kamenetskii Theory, Navier Stokes equations, and so many others that this worker admits to being clueless about but can deal with in some cases with suitable software whether commercial or free is a cruel and unusual punishment. It is like baiting a fire trap for them to fall into.

Fighting injury and death, system and mission damage is serious business. And even if ASTM can not be reprogrammed onto the straight and narrow, the good people of G4 need to care about their clients and customers welfare and, in a world of trolls including malicious trolls, can *and should* deploy a standard (a written guidance, on applicable software and its use) with the same kind of wisdom employed in all of its other oxygen safety opinions ...*even if it does not distribute the actual software*. An example standard draft offered as a starting point is proposed [***13***] and recommends addressing the Committees own legacy G4Math algorithm, and potential derivatives, proposed alternative software that may be marketed or open-sourced (such as the early proposed FLLAME algorithm even before the elite G4 Task Force forms its opinion), and certainly thermal-chemical equilibrium software, computational fluid dynamics software, and the NIST thermophysical properties algorithm.

Computational Fluid Dynamics (CFD) software is massively challenging to operate perhaps because CFD theory itself is massively complex. Nonetheless, CFD data are useful. They can help identify: probable particle impact sites, regions of a system likely to experience greatest adiabatic compression heating, mixing of gases. Documenting such things could be the basis for a symposium or seminar paper but might be better as a balloted standard. A separate atlas of example data may be warranted.

Thermo-physical Properties Data, especially for real gases, have been very elusive to the committee, Two papers in the G4 forum [***41,42***] sought to address the topic: one with proprietary software [**41**] and the other with mathematics beyond the level of the average oxygen safety practitioner [***42***]. In this instance, software is available from the impeccably credentialed NIST that can be installed for a nominal fee on one's PC [***43***] or can be accessed for free on the Internet [***44***] This worker has used the software to offer a simplified opinion of real-gas behavior in a comprehensive approach [***22***] and even coded some reader software but the results have not been vetted yet might serve as the basis for a data standard, selected data extractions and simplified "reader" software to aid the rank-and-file and even some lettered oxygen safety practitioners in a balloted standard. A separate atlas of example data may be warranted.

Thermo-Chemical Equilibrium software is yet another challenging software to operate, so much so that its data may need to be generated by elite practitioners. However, the promise of these data is so valuable however that a separate standard is proposed below on interpreting consensus thermal profile data generated with TCE software.

Thermo-Chemical Equilibrium Data for Oxygen System Fire Safety Analysis

The benefit of TCE analysis was first called to the communities attention outside the G4 collegium in 1992 with great accolades by NASA+ workers [***15***]. However, it was immediately criticized by they themselves and effectively abandoned and discouraged. Repeated efforts of this worker to resurrect the topic have been declined and at times simply ignored.

This worker personally believes this opposition, this extreme apathy, is the result of two things: the inability to reconcile TCE analysis with a NASA+ promoted theory of copious excess oxygen in burning iron slag (which this worker refutes [***10***]), as well as numerous quirks in the NASA TCE software the original authors used combined with their apparent misuse of the software. Numerous efforts (some perhaps flawed even as badly flawed as the NASA+ efforts) to explore this have been prepared but ignored [***16-21***] and more recent efforts have continued [***14***] and seem to be improving and making the case much stronger.

TCE analysis offers significant economic access to calculations and combustion models that cover currently unexplained or misunderstood combustion behaviors in a way that can tutor even the unlettered among us and could potentially supplant in many cases and even replace costly laboratory metals testing in a number of cases. Where validated, a standard on TCE data should begin with an atlas of material thermal profiles that are not available any where else. And "reader" software for those profiles should be provided or at least vetted in the previous standard proposal.

Guide to Low Pressure Polymer Oxygen Systems

Chairman at the time, Joe Slusser (mid 2000s) proposed a standard like this in the latter 2000s to specifically address numerous polymer systems that use oxygen at low pressure that can and have safely taken exception to or skirted close to the limits of numerous conservative safety practices. To wit, oxygen acetylene hose kits, fish farming where low pressure O_2 is sparged into water vats. Of course low pressure oxygen is not harmless, home medical oxygen use (during COVID) at one point reported an oxygen related fire fatality every few days. In each of these cases and others, there is no practical alternative to polymer systems based on mechanical needs and costs. So how does one cope?

A 2008 Slusser draft standard [***45***] was circulated for several rounds of comment, yet was somehow thwarted and lost all momentum and went nowhere. Copies are still available but are not linked here due to the ASTM and G4 non-transparency program which disallows such distribution without “special permission”. G4 should issue and encourage blanket circulation approval, unless the cognoscente are consciously trying to limit comment to their own machinations (a too-plausible prospect previously addressed in this dissent).

However, it is interesting to compare this effort to a current burgeoning effort on a standard for filters.

Indeed, in either case, one could imagine strategies that might spawn a series of papers on either about implementing those strategies in specific instances. However, tactics (even rationalizations) for justifying liberties taken in low pressure polymer systems can be addressed in a single standard. In comparison, a filter like a polymer system should also comport to the principles of G4’s five core standards (G128, G88, G63, and G94 and G93). This worker foresee a huge standard required to address all filter contingencies in a single standard. And indeed, if low pressure polymer filters are a leading bone of contention, one can easily see a section in the Slusser standard that could address specific concerns that be treated exceptionally in the same way that they might apply to other systems also. Note the filter standard issue is also addressed in the following section “**Standards Whose Adoption I Dissent To”**.

Section 6

Standards Whose Adoption I Dissent To

G4's recent cryptic Minutes cite three current plans. For some time documents on performing assessments, designing filters, and safety training compliance have been mentioned. This worker has not seen drafts of any of them. And these dissents may not prove applicable, but are based upon a macro perspective:

Oxygen Compatibility Assessments

A *Standard Guide for Performing Oxygen Compatibility Assessments on Oxygen Components and Systems* may be well-defined within the attending cognoscente, but its details must be surmised in the hinterlands. It seems to seek a method of doing material or system design hazard evaluations. This worker has been exposed to and has used a spectrum of well-established generic process hazards review methods including preliminary assessments methods.

In the 1970s massive efforts were expended industrially to configure Fault-tree, What if?, How Can?, Failure Mode and Effect, and HAZOPS doubtless among others. It is hard to imagine in these days that there is anyone (though certainly there must be) who has not used or adopted one or the other of these methodologies. Different folks have differing opinions of each but each has its own following. Some have been discussed and cited in papers within the G4 Symposia series. None has been deemed inappropriate for oxygen systems.

Indeed early G4 was deliberate in its effort to develop ethics that could be integrated into rather than replace any of these strategies. More so, in the early 2000s, NASA workers including a recent chair published a paper [***46***] describing how NASA does such evaluations using a Microsoft Access database and offered free copies[5]. This was a superb example of demonstrating options.

Indeed in some quarters, where established practices, or system designs or material selections are undesirable for perhaps non fire-related reasons, often exception to those practices is based upon these more generic methodologies to establish a basis. This seems inverse to establishing a procedure to replace them, ...if that is what this effort seeks. Of course though this effort has been

[5] The NASA MSAccess file would qualify as another instance of potential software akin to G4 Math and other PC utilities. One wonders if this was ever integrated into the education course as a optional utility. One hopes its disclaimer and voluntary nature were scrupulously explained.

forecast for a number of years, details of its suggested approach are scant to this worker.

As a result, this worker feels a standard on just one of the numerous available assessment methods would come across as a attempt to dictate procedures or might inadvertently become that. Some NASA+ cognoscente may agree with such a recommendation, but this worker disagrees. Indeed there was some earlier discussion on whether this new approach should supercede any of the existing G4 standards, especially G88, a highly ill-advised posture to take. A voluntary approach might be more welcome if it sought to integrate in the existing systems, but maybe this can be achieved.

The new proposal, hopefully not something that will be sprung on the full committee in a surprise ballot may become or may be majority adopted, but this is to argue, the effort continues to be more suited for a series of papers. Papers that might be collected into a compilation or a manual. Indeed, a “User’s Group” might be indicated. It is another case of where G4 might vet the procedure and software (if present) and perhaps make them available after reprogramming of ASTM.

Standard Guide for Filters

Like Dracula coming back from the dead, recent G4 Minutes indicate there is renewed interest in a standard for filters. The G4.02 Practices minutes (or maybe it is just an agenda) of 02 November 2023, notes a filter standard “was first proposed 15 years ago” (that would be about 2008).

A bit of historical correction is needed. The first call for a standard on filters dates to the later 1980s (about 40 years ago). At that time G4 was approached by the Semiconductor Safety Association which was seeking to use huge polymer filters for the oxygen supply lines in clean rooms of semiconductor industry fabs. So there was a prospect that these low pressure filters might seek to ignore or skirt some traditional oxygen safety measures (perhaps ala the kind of principles Joe Slusser was seeking to address with his low pressure systems standard), but also there was a prospect that filters in high pressure systems might be needed.

Filters have always been a bone of contention, not just in how to design them but in whether to use them at all. However, in this case the issue was not filtering for system safety but product purity. G4 at that time concluded standards for individual components, especially filters, were ill-advised not just because of the many variables that would have to be factored in but for the large numbers of different kinds that would be needed. G4 simply lacked the energies to undertake such a huge effort, and to focus all of its scant energy on one hardware example to the exception of all others was risky. For example how does one justify elevating one kind of filter or filters among the full spectrum of hardware as being so important as to warrant its own standard when such a heavy investment of precious and scant Committee working time would be consumed, especially

these days. Has undue influence been exercised.

Back then a compromise was adopted. G4 was in the process of launching its symposia series, and soon its education course, and so a pertinent example of a filter evaluation was included in G63 and is probably still there.

Furthermore one might ask a question in anticipation of hearing it someday on a court room; “Why was privileged status granted to a standard for filters to the exclusion of all other hardware out there” or perhaps the filter task force is committing to produce an encyclopedia of hardware design standards. As in the previous topic, perhaps a “Filter Users Group” could launch, though in this judgment, a better fix would be examples of specific filter design procedures presented as papers within the symposium proceedings (possibly a better use of that organ than it has been put to recently).

Guide for Technical Training for Oxygen Safety

G4 has a course on oxidant safety. Probably thousands of students have attended. In the past G4 offered (and maybe still does) a technician level abbreviated and refocused course. Hence one wonders what a voluntary standard on “technical training” would cover. Does it suffice to say in such a document: “G4 offers two courses that students can take as needed ...end of standard.”

However, in the past G4 minutes have cited a need for establishing “compliance” standards. How does one comply with a voluntary standard? Sadly, a standard on real or defacto compliance sounds preachy and code–like. This new standard may seem a noble effort to ensure vital sensitivity to the oxygen hazard. But it also seems very much like an effort to coerce students into the G4 course at great expense. Perhaps worse to induce specific coercion. And also like a cash-flow device when the vigorish to avail one-self of all the benefits of G4 public service safety is already rather large and could use a stern diet.

A standard like this risks creation of a false light perspective on G4. G4 used to provide tools to incorporate into a customers system, not to establish “compliance.” Perhaps a worthwhile text might be possible but G4 needs to tread very lightly on efforts like this. And even if a valid standard is possible, and not recalling earlier recognition that a volunteer committee does what its volunteers are willing to do, better use of G4s severely self-limited discretionary energies may be more beneficial.

Section 7

References/Links/Software

[1] Werley, B. L. *The Saga of ASTM Standard G124 (2010 and 2018 Versions): How a Standard Intended to Make Oxygen Systems Safe, Became Unfit for Use*, Self Published Public Domain Opinion, 2020, 117 pages

[2] *Industrial Practices for Gaseous Oxygen Transmission and Distribution Piping Systems, Pamphlet G-4.4*, Compressed Gas Association, Arlington, Va., 1973.

[3] Lang, A., **"Air Fractionation Plant Explosion"**, Chemical Engineering Progress (also Safety in Air and Ammonia Plants Vol. 4), Vol. 58, No. 2, pp. 71-80.

[4] Lapin, A., *Liquid and Gaseous Oxygen Safety Review*, Vol. I-IV, NASA-CR-120922, APCI TM184, NASA Lewis Research Center, Cleveland OH, June 1972. (NTIA N73-14718)

[5] Lapin, A., **"Oxygen Compatibility of Materials"**, Presented at the International Institute of Refrigeration Conference, Brighton, England, 14-15 November 1973.

[6] Neary, R, M., **"ASTM G 63: A Milestone in a 60-Year Safety Effort"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres, ASTM STP 812*, B. L. Werley, Ed., American Society for Testing and Materials, 1983, pp. 3-8.

[7] Koch, U. H., **"Oxygen Piping Code—Where Knowledge Becomes Practice: Keynote Address"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319*, W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, 1997, pp. 5-13.

[8] Werley, B. L., **"Oxygen Incident Clusters and Nightmares"**, Self-published opinion, Public domain 2026, 4 pages.

[9] Werley, B. L., **"The NASA+ 800 Pound Gorilla"**, Self-published opinion, Public domain 2026, 19 pages.

[10] Werley, B. L., **"The Great Excess-Oxygen Hornswoggle?"**, Self-published opinion, Public domain 2026, 41 pages.

[11] Werley, B. L., **"Hazards of the ASTM/G4 Deplorable Peer Review Process: Personal Case Studies"**, Personal opinion, Public domain 2026, 27 pages.

[12] Wikipedia Entry: **"American Society of Mechanical Engineers, Inc., v. Hydrolevel Corp."**, accessed 03March2026, https://en.wikipedia.org/wiki/American_Society_of_Mechanical_Engineers,_Inc._v._Hydrolevel_Corp.

[13] Werley, B. L., **"Standards for Computer Algorithms for Oxygen System Safety Analysis "**, Self-published opinion, 2025, public domain 2026, >16 Pages.

[14] Werley, B. L., **"Thermo-Chemical Equilibrium Data for Oxygen System Fire Safety Analysis"**, Self-published opinion, original publication 2025, public domain 2025, ~40 Pages.

[15] Steinberg, T. A., Wilson, D. B., and Benz, F., **"The Combustion Phase of Burning Metals,"** *Combustion and Flame*, Vol. 91, No. 2, 1992, pp. 200-208.

[16] Werley, B. L., **"A Comparison of CEA and HSC Software for Oxidant Safety Thermo/Equilibrium Analysis"**, Self-published opinion, *BWOpinion*, 2010, 31 pages.

[17] Werley, B. L., **"A 'Simplified' PC-Based Thermo Analysis of Iron During Combustion",** Personal opinion paper, *BWOpinion* Website, www.enter.net/~bwerley, 2008, 50 pages.

[18] Werley, B. L., **"Graphical Interpretations and Parameters for the Thermo-Analysis of Oxidant System Fire Safety"**, Self-published opinion, *BWOpinion*, 2010, 24 pages.

[19] Werley, B. L., **"An Introduction to Thermo-Chemical Equilibrium Principles for Oxygen-Compatible Hardware Designs"**, Self-Published opinion, *BWOpinion*, 2014, 21 pages.

[20] Werley, B. L., **"The Aluminum-Bronze Conundrum: Slow-Motion Model Burn Ratios and Their Use"**, Self-Published Opinion, Public Domain 2022, 32 pages.

[21] Werley, B. L., **"Phase Issues in Thermo-Chemical Equilibrium Analyses Software "**, Self-published opinion, Public domain 2025, 29 pages.

[22] Werley, B. L., ***A Tutorial on Fire Safety Issues of "Adiabatic" Processes in Real– and Ideal-Oxidant Systems".*** Original copyright 2007, 2016, Donated to Public Domain 2016, 135 pages.

[23] Werley, B. L., **A Bibliography of the ASTM Committee G4 Oxygen Safety Collegium, Circa 2026,** March 2026, 48 pages.

[24] Werley, B. L., **Ref150426**.doc (Partial Update of the 2005 ASTM G4Ref14.doc file to include STP papers 2005-2021), ~125 pages, March 2026.

[25] Lehamn, J. Y., Wei, X. C., Hua, Q. X., and Delannoy, **"Investigation of the Fushun ASU Explosion in 1997"**, *Journal of Loss Prevention in the Process Industries*, 16(2003) pp. 209-221.

[26] van Hardeveld, R. M., Groeneveld, M. J., Lehman, J. -Y. and Bull, D. C., **"Investigation of an Air Separation Unit Explosion"**, *Journal of Loss Prevention in the Process Industries*, 14(2001) pp. 167-180.

[27] Rago, J. J., "**Failure of Stainless Steel Check Valve in Oxygen Service**", *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319,* W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, 1997, pp. 53-57.

[28] Rago, J. J., "**Failure of PTFE-lined Flexible Hose in Oxygen Service**", *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319,* W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, Philadelphia, 1997, pp. 58-67.

[29] Santay, A. J. , Becker, I. D., and Werley, B. L., **"Design Strategies for Polymer-Lined Flex-Hose Distance/Volume Pieces"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319,* W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, Philadelphia, 1997, pp. 93-107.

[30] Werley, B. L., and Hansel, J. G., **"Flammability Limits of Stainless Steel Alloys 304, 308, and 316"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319,* W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, Philadelphia, 1997, pp. 203-224.

[31] D'Imperio, V. J. and Werley, B. L., **"Oxygen Compatibility of FKM Elastomers"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319,* W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, Philadelphia, 1997, pp. 350-358.

[32] Castillo, D. G. **"Eliminating Bypass Valves in Selected Oxygen Systems"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319,* W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, Philadelphia, 1997, pp. 432-444.

[33] Werley, B. L., **"A Brief Study of Steel Combustion Using Quick-Frozen Test Specimens"**, Presented at the ASTM Committee G-4 Fall 1995 Seminar (14 November 1995, Norfolk VA), Air Products and Chemicals, Inc., Allentown PA, 1998, 27 pages.

[34] Lewis, M., Jeffers, N, and Stoltzfus, J. M., **"Promoted Combustion Test Data Re-Examined"**, 4th International Association for the Advancement of Space Safety (IAASS) Conference: "Making Safety Matter", May 19-21, 2010.

[35] Werley, B. L., **"Bizarro Ignition: "Cosmic-Ray and Atom-Decay Induced Fires In Oxygen"**, *Commentaries on Oxygen and Other Oxidant Fire and Explosion Safety*, Self Published opinion, Original Publication 2010, Public Domain 2019, p. 9-16.

[36] Werley, B. L., **"Bizarro Ignition: "Real Oxygen Safety Science or Just Science Fiction?"**, *Commentaries on Oxygen and Other Oxidant Fire and Explosion Safety*, Self Published opinion, Original Publication 2013, Public Domain 2019, p. 17-28.

[37] Chou, T. C., Royals, W. T., and Steinberg, T. A., "**Overview**", *Flammability and Sensitivity of Materials in*

Oxygen-Enriched Atmospheres: Eighth Volume, ASTM STP 1319, W. T. Royals. T. C. Chou, T. A. Steinberg, Eds., American Society for Testing and Materials, 1997, pp. 1-3.

[38] Werley, B. L., **"Proposed Additions to ASTM G 145 on Incident Study"**, Self-Published paper, 2007, 12 pages.

[39] Werley, B. L., **"Supplemental Suggestions for Oxygen-Fire Incident Prevention and Investigation"**, *Commentaries on Oxygen and Other Oxidant Fire and Explosion Safety*, Self Published opinion, Original Publication 2007, Public Domain 2019, p. 65-76.

[40] Werley, B. L. **"One Potential Approach to an Introductory Standard on Oxidants Other Than Oxygen"**, Self-Published opinion paper, 2007, 88 pages.

[41] Leslie, I. H., "Thermodynamic and Fluid Mechanic Analysis of Rapid Pressurization in a Dead-End Tube", *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Fifth Volume, ASTM STP 1111*, J. M. Stoltzfus and Kenneth McIlroy, Eds., American Society for Testing and Materials, Philadelphia, PA, 1991, pp. 399-413.

[42] Barragan, M., Wilson, D. B., and Stoltzfus, J. M., **"Adiabatic Compression of Oxygen: Real Fluid Temperatures"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Ninth Volume, ASTM STP 1395*, T. A. Steinberg, B. E. Newton, and H. D. Beeson, Eds., American Society for Testing and Materials, West Conshohocken, PA, 2000, 256-265.

[43] Lemmon, E. W., McLinden, M. O. and Huber, M. L., *Reference Fluid Thermodynamic and Transport Properties—REFPROP*, Version 7.0, CDRom Windows Software, National Institute of Science and Technology. Gaithersburg, 2002.

[44] Lemmon, E. W., McLinden, M. O. and Friend, D. G., **"Thermophysical Properteis of Fluid Systems"**, in NIST Chemistry WebBook , NIST Standard Reference Database Number 69, Eds. P. J. LindstromW. G. Mallard, June 2005, National Institute of Science and Technology. Gaithersburg, MD< 20899, 9http://webbook.nist.gov).

[45] Slusser, J. W., **"Large Scale Use of Polymer Pipe, Tube and Components in Oxygen"**, Draft ASTM G4 standard, WK 15105, 02 April 2008, 15 pages.

[46] Peralta, S., and Stoltzfus, J. M., **"A Database for Performing and Archiving Oxygen Hazard Analysis"**, *Flammability and Sensitivity of Materials in Oxygen-Enriched Atmospheres: Tenth Volume, ASTM STP 1454*, H. D. Beeson, and B.E. Newton, Eds., ASTM International, West Conshohocken, PA, 2003, 307-315.

Section 8

Appendix

NHTSA Case Study
When Standards are Not Voluntary
...and Run Amuck

In 1776 there was a revolution in the Americas and the USA was born. It occurred because some folks wanted freedom. Where they originated from was too controlling up to and including the ownership of slaves whose lives were entirely under the control of a “master”.

The new world had lots of appeal and risk and pockets of control arrived and grew also including slavery that was soon employed therein. A republican form of democracy was crafted into a government that sought to make every citizen a part “master” of the nation itself. Large scale slavery that formed was later violently eliminated in the 1860s. However to be honest, the “masters” fought like Hell to keep it and to this day seem to want it back.

But those slave-masters, by and large, were not exterminated. There was no post-war genocide. Those slave masters and their issue have sought for the last entire term of the nation to regain their control over us all. They see it as their destiny to rule us. They think they are better than we are. And today they are highly organized under the banner of The Democrat Political Party (and The Republican Party is oftentimes nearly as bad). A roughly ten percent tax on tea that symbolized the need for violent revolution back then has been carefully nurtured into massive taxation under numerous euphemisms including:

Income tax
Social Security tax
Medicare tax
Medicaid tax
Obamacare tax

Value-Added tax
Sales tax
Excise taxes
Head tax
Property tax
Inheritance tax
Estate Tax
Insurance tax
Charity tax
Permit tax

And more, perhaps the most sinister of all:
Inflation tax

Some who have lived as long as I have, have seen intrigues like this for what they are. We know about such abuses as the Indian Removal Act from North Dakota, their massacres like Wounded Knee and Waco, the manipulations to fight WWII (Human Life taxes), but also the day-to-day tax and other controls they pursue so devotedly.

The “Camel’s Nose into the tent” metaphor applies also called by the Google AI as the metaphoric “slippery slope argument” or “the thin edge of the wedge” metaphor.

Among the most insidious of these are the recent face mask mandates applied under bogus emergency declarations in five (of course) Democrat-run states in particular: NY, CA, MI, NJ and my own PA. It was 2020 and the 45th President had been doing well despite massive Trump Derangement Syndrome and insurrection. The Democrat governors in those five states imposed lockdown (the modern Democrat successor to their very own use of internment in the 1940s,) under the bogus arguments that exaggerated the dangers of COVID, yet spread the infection, and in this judgment literally sought to maliciously damage the country to make Trump look bad. Hate like that can literally (yes literally) be compared to when Hitler sought to end the Jews.

But their control obsession was and has always been manifest in many ways and not only big ways but sometimes in surprisingly petty ways. One can cite hundreds of ways that Lord Acton’s fear has been visited upon us. Laws that are stupid and can only be meant to control.

Regulations ditto. Taxes, codes, ditto. Ditto. Ditto. Ditto.

The examples are legend of how even small seemingly harmless or even perfectly good controls burgeoned into nightmares. “Power corrupts and absolute power corrupts absolutely”, ...and even little bits of power corrupt far beyond what one might initially expect.

And it can and has on occasion obtained from a slow but inexorable mechanism. This writer has seen it on large and small scales. Camel’s nose and tent ways. Well meaning laws that slowly become oppressive. Good laws that evolve into serving the purpose of simplifying enforcement rather than meeting needs. Some examples are in order since this is what this writer fears has been happening within ASTM G4.

NHTSA (the National Highway Traffic Safety Administration) is a wonderful example, among many. NHTSA is a cautionary tale and the following is what I have witnessed in my long life. They are a model for what ASTM Committee G4 should work like Hell to avoid becoming but, instead, G4 appears to be following in their footsteps.

For years auto safety laws were based largely on common sense. For example automobiles were required to have headlights for obvious reasons, and since they might and often did fail, headlights were standardized across all auto brands. The law went too far but fortunately had no grave faults and much benefit. If your headlight burned out you could go anywhere in the nation and obtain an inexpensive sealed beam to replace it.

This practical headlight approach was broken in this opinion by Toyota in the early 90s. Due to the gas crisis, streamlining of cars (of negligible benefit for many drivers) was argued to be necessary on their new and high quality but expensive Camry. So instead of having $3 sealed beam headlights it had custom molded slanted lenses that cut through the air a tiny bit better but cost hundreds to replace following an accident. Of course they were placed very near the front of the car (in order to “streamline”) where even small accidents would destroy them. For all the good Toyota did for cars, this was not one of them in my opinion. My 1991 Dodge Daytona had cheap sealed halogen headlights that never failed because I hardly ever drove at night. In 65,000+ miles over about 15 years not one was replaced.

Over the years other common sense laws were passed of little harm, little foul, yet much benefit. Safetyglass, seat belts, interior pad-

ding, positive crankcase ventilation. Lots of good at little cost ..and some of it of voluntary use.

Nonetheless, Government had been intruding the camel's nose into our tent. Pushing us out onto the slippery slope, poking us with the thin edge of the wedge.

And thanks to Ralph Nader but not he alone by any means his book "*Unsafe at Any Speed*" largely a book of ignorance or lies fabricated to justify control, the National Highway Traffic Safety Agency (NHTSA) was created in 1970 to control dangerous cars for "the general welfare" all under the heavy hands of the "right" people.

Soon NHTSA was writing regulations that saved lives as they often told us. However, *they also took lives* with much less publicity. In the later 70s they often forced changes or additions that they argued would reduce the total number of auto fatalities. Unfortunately often they reduced the risk to one larger identifiable group while increasing the risk to a different smaller identifiable group. I was in several cases in the different identifiable group. My life did not count as much as some others (and not for the first time under Democrat tyranny). In some cases they increased *my* risks while boasting about saving lives as if they were acting on *my* behalf. Indeed their motto was, and may still be, "People Saving People". And like some of those in ASTM G4 they were/are arrogant.

Hitler could have claimed that in destroying the Jews, a smaller fraction in the world, he was reducing societal friction in the larger fraction and therefore saving more lives among the larger faction. His Nazis were "People Saving People".

Much like in ASTM G4 many of the early NHTSA actions seemed "voluntary". Seat belts were required to be installed but users decided whether to use them or not. This worker has no doubt that seat belts both saved and killed. Furthermore they saved more than they killed among those who wore them. But that was probably of little comfort to those that they killed.

Then came the laws requiring seat belt use. Highway taxes taken from us by the federal government would be returned in part to the states but only if they passed laws requiring the wearing of safety belts. However, at first you could be ticketed but only if you were stopped for another offense. So if you were not wearing your belts, you provided an incentive to find a second infraction that might otherwise

be overlooked to be not overlooked. One wonders if bogus citations were overturned whether the consequential seat belt citations were also overturned.

In the late 70s and throughout the 80s, this trading of lives was common. Many people made the choice *not* to wear belts and like some who did not choose to use air bags were killed by them, some who chose not to wear belts died in crashes, and NHTSA started trading lives (Quid Pro Quo). They reasoned more than once that if they made belt use easier and more comfortable even though less effective that more people who did not wear them would then wear them and be saved, and would outnumber those who would die among those fools who wore the previous belts that were less comfortable that would have saved them but died wearing those less effective belts. This worker was in the latter category who wore the less comfortable belts.

Air bags were very popular with the Nader minions. And car makers did not mind being forced to sell every customer additional stuff they were forced to buy. And a mandate to install them at substantial expense was ultimately decreed. After studying numerous NHTSA crash tests, following their dictatorial “life-saving” it became obvious to this worker that while air bag use might save some lives it would again also take some specific lives. The lives saved would be among people who were indifferent to safety including folks who might crash while driving drunk and who often refused to wear safety belts. But the lives taken would be among shorter people (mostly women) and children who would be too close to the exploding bag or out of position in an accident. Again in my case air bags were being compelled while existing and much better safety belt systems were not. And those air bag/belt systems came with additional risks as well as benefits. I was forced to accept those risks. And so I became a trade-off, a potential human sacrifice. Not for the first time.

I wrote an analysis “*Take Charge of Your Car*” and sent it to NHTSA and new President William Clinton roughly at the time when those folks were being slaughtered in Waco and he forwarded my letter to NHTSA. I got a gracious letter back saying in essence “don’t worry, we got this”, thank you so much. But like many of my proposals to ASTM G4 who also graciously received them, nothing happened. They were apparently too busy saving *certain* lives. Clinton would turn his attention to outlawing bogus assault weapons because he cared so much

about saving lives.

I repeated the mailing and again received a wonderful letter from the NHTSA main regulator in effect telling me to mind my own business. They had made their decision on air bags and were going to let the chips (or in this case the chips were bodies) fall where they will.

And the chips did fall. As so often happens, soon when the number of air bagged vehicles shot into the millions, reports were being issued about the number of small women and children and babies who were being killed by air bag deployments. In at least one wonderful case the car was not moving, was not struck. Boom! Dead woman. In another a slight bump triggered the air bag and tore a babies head off and threw it out of the car. They shot past a thousand. Indeed to some of us the risk of dying from air bags was much greater than the risk of dying from fully automatic rifle fire. Courtesy of the Democrat's regulations. The Government however was busy working its ass off to ban AR-15 rifles that are not fully automatic (and they succeeded), to in their sick minds "Save More Lives". Remember how Democrats used to proclaim even semi-automatic rifles have no purpose other than to take lives, sort of the way I felt about air bags.

So were life-saving life-taking air bags banned. Nope. Instead NHTSA came back and said that air bags were being "depowered". And each year goals were set to kill fewer innocent victims of NHTSA safety. And the "people their people were saving" were soon required by law to wear safety belts. No more voluntary use. Camel fully inside tent. Indeed, the wearing of safety belts had to be mandated to reduce the number lives killed by air bags. I was living in bizarro land. We were being controlled against our wills in order to protect us from the hazards *they installed in our cars* without our permission. Does that remind you of how when Democrats were Southern slave masters how they cared for *their* property.

In 1960 I briefly owned a 1953 Studebaker. In 1973 I reworked a heavily used 1962 Nader-Damned Corvair (including installing both seat belts and shoulder harnesses and a few newer safety items) and drove it mostly winters for its vaunted snow traction for about six years. Millions drove similar VW Beetles. All three cars were absent many of even today's simplest safety equipment (absent air pollution equipment also for that matter).

They lacked:

high speed tires
dual brake circuits
crush zones
5 mph bumpers
10 air bags
lap belts
shoulder harnesses
daytime running lights
high central stop lights
crash testing
RADAR
LIDAR
blind-spot monitors
lane assist
emergency braking assist
collapsible steering columns
child restraint tethers
back up cameras
stability control
traction control
door braces
multilayer glass
pyrotechnic belt retractors

and on and on, none of which was free.

Forced consumerism reigned.

But that Studebaker, that Corvair, those Beetles, could be built in various ways today at a cost far less than all of today's mandate-laden vehicles pushing past $100k in some cases. The slave-masters were back as our new highway masters. And so some verities need to be recognized.

Fortunately today one can and should be able to still ride a motorcycle or even bicycle, and some do. Bicycles are becoming very common. Especially the new electric bicycles. Indeed, Democrats even promote bicycles and special lanes for them. Yet both are much more dangerous vehicles to drive than a 53 Studebaker or 62 Corvair, or Gen 1

VW Beetle.[A1] This worker supports the right of bikers to make this "choice", but anyone who rides a bike out of economic need or social consciousness that dies is being killed (indeed this worker considers it murdered) by NHTSA: "People Killing People". A Democrat "final solution". But these people do not count and do not get counted. Yet that is okay so long as they are offset by a greater number of those whose lives that are "saved" by cubic-money control technology.

This worker has paid obscene taxes for at least six decades so that my masters in government could be pretend Santa Clauses, giving that which was not their's to give, to so many not too smart people who do not earn their largesse but who got it as Elmer T. Peterson predicted they would through the ballot.

Car manufacturers do not stand up for their customers rights, they are only too happy to have their customers forced to buy expensive safety equipment from them especially when they do not need it and would not have purchased it otherwise. Forced consumerism. Especially when it tethers the customer to them for expensive service.

While either kind of cycles might pollute less, and save energy they remain a major source of risk. Indeed, they are a major source, if not the major source, of organs for transplantation. Perhaps NHTSA should count those harvested transplants as more people they have saved. Indeed, a talented serial killer or mass shooter or drunk driver who kills a fellow citizen may generate numerous life-saving transplant organs and qualify as people saving people. Yet folks who can not afford or just don't want to spend 20-100 thousand dollars on rolling high tech monster money pits, who might instead be "forced" or even just nudged into the more dangerous cycles don't get counted against our NHTSA masters (that is to say, monsters).

It was all so clever. Democrats are so fucking clever. What happened with NHTSA is what I have seen happening to ASTM G4 and I suspect many many other "standards" groups. There is a tendency in human nature to seek power to control that must be resisted every day the way the alcholic must resist the drink every day.

The starting point was a good idea, but improving auto safety and auto pollution was corrupted and overrun by left wing fascists who al-

[A1] On 02/03May2026, Fox new reported on an SUV/bicycle encounter: "**WATCH**: Driver smirks in mug shot after allegedly hitting a group of cyclists in caught-on-camera road rage." The video does not capture the cyclists lap and should harness pyrotechnically retracting, the chest and knee and side air impact bags deploying. The emergency braking system kicking in. In 2026 there were no people in NHTSA saving these people.

ways fall prey to the siren songs of power addiction. And I fear the same mechanism is leading factions within ASTM G4 to wander from its rightful “staff” role into a self promoted “line” role. To start talking about “compliance”. Some of these folks think they are the best, like the cream they are simply rising to the top where they rightfully belong, in their own opinion. So why should underling folks like us worry our pretty little heads when we can just do as *they* tell us. After all, isn’t taxation even massive taxation without representation just another form of “people saving people”?

And we are really rather disappointing. Far too many of us buy into their claims of giving us free stuff. This is why huge crowds that nonetheless represent a tiny fraction of the republic, commit their mostly-peaceful intimidation protests for more free stuff rather than for jobs and freedom. “Ask not what you can do for your country, Ask what your country can do for you.” I believe some ass-hole Democrat said that once upon a time.

And that is why this worker withholds his citizen’s consent from the NHTSA and dissents to ASTM Committee G4.

Document
End

BLANK PAGE