Flight Test News

http://www.sfte.org/

Spotlight on Dave Houle

Dave Houle is a lifetime member and Fellow of the SFTE, having served as President of the Society after serving as president of his local chapter. Dave has recently donated an extensive collection of historical copies of the Flight Test News. He writes this:

"Was at Boeing Seattle when the SFTE was formed by Boeing FT in 68/69. I knew most of them. Was then laid off and joined Douglas in 70. There was a fairly big migration from Seattle to Long Beach and Palmdale. Douglas and Lockheed were gearing up for the DC-10 and L1011 programs. There was a joke about the Boeing and Douglas/Lockheed FT orgs undergoing a step change in technical capability – with the up or down change dependent on whether you were left at Boeing or were one of those going to the new organization.

I joined SFTE in early 70s. The LA chapter was the second SFTE chapter.

Stayed at Douglas for 29 years and retired in 99. I was extremely fortunate in that I did nearly all the engineering tasks that exist in a flight test organization and even worked as a mechanic when ours went out on strike in the early 1970s. Best accomplishment of my "team" was two – growing the test conductor group (called FTEs at Douglas) from about 5 to well over 20 in a few years (am proud that I was able to beg/borrow resources to do realistic training); and managing the MD-11 FT technical section where we redid the FT program estimate completely, at the time of the big MDC reorganization in 89. Personally, I am proud of being the one continuous member of the Douglas FT Safety Review Board (SRB) from its inception in 1981 to the closure of the Douglas FT organization in 2000.

Before I decided on engineering as a career, I thought to be history teacher and have always had an interest in it. We must strike proper balance in looking back and looking forward—easy to say and hard to do. The key is having records to look back upon and impressing this upon our people.

What we learn varies so much as individuals, yet that varied learning helps the group or program. Each individual will learn something different from reading and studying the same material from the past, and that's the gain—that's why it's important to provide the resources. Each of us works in an environment forged by those who went before us. They were just as smart as we are. SFTE helps an individual learn what is happening in the present, and can help an individual learn what happened in the past."

Symposium Registration

The Antelope Valley Chapter presents the 46th SFTE International Annual Symposium.
Lancaster, CA. Sept 14-17, 2015
Register now on the SFTE webpage
http://www.sfte.org/registration

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Thinking outside the Bookshelf

"Imagine if someone told you that a year from today, you would be required to take a test in which every wrong answer resulted in the loss of a human life. How would you approach studying for the test? Would you study for twenty to thirty minutes every night or would you wait until a week before the test and start cramming?" (Joe Byerly). These words posed by an Army officer ring true in Flight Test, but professional development is even more critical because what we do is not placed statically on the calendar. Instead, on any given day, each of us could face a pop quiz where the cost of unpreparedness ranges from a surge of adrenaline to catastrophe.

Just like the profession of arms, Flight Test exacts a penalty when we allow apathy or complacency to dull our knowledge and skills, but this is not without remedy. To address this hypothetical test, Byerly identifies three important principles we should consider:

> *"1. There is a cumulative value to investing small amounts of time in self-study over a long period of time,*
> *2. Neglect also has a cumulative effect, and*
> *3. You cannot make up for lost time."*

(http:/fromthegreennotebook.com/2015/06/07/three-truths-about-the-personal-study-of-war/)

A link to Byerly's article appeared on the SFTE Facebook group and sparked another conversation about professional reading lists. Emerald Coast member Nate Cook asked, "What would you put on a professional reading list?" Replies included: *The Tao of Flight Test* by Mark Mondt, Fred Stoliker's *Flight Testing at Edwards (1946-1975)*, Ralph Kimberlin's *Flight Testing of Fixed Wing Aircraft*, *Skunk Works* by Ben Rick, *Handling the Big Jets* by David Davies, Gene Kranz' biography, anything by Darrol Stinton, and *Space Walker* by Jerry Ross, a distinguished test pilot school FTE graduate.

Respondents to Nate's question varied in age and experience, and some comments even highlighted how important it was to consider these characteristics when answering. Should the new FTE read the same books as our Society Fellows? Certainly biographies and histories are important, but what else should be on our shelves? What other areas of our professional development should we give particular attention?

One model envisions professional development as a three-legged stool. The legs represent the technical, management, and business elements of our profession, while the seat is leadership, the piece that holds everything together. When used as a step stool, the strength & workmanship of the stool would limit or extend the height of one's reach. Similarly, our achievement and safety in this profession correlate closely with the attention given to each part our own development, especially at different stages of a Flight Test career, so let us examine these parts individually.

Technical Expertise
Any cursory review of our profession reveals a need for various general skills such as working spreadsheets, data mining, and statistics, and of course, there is specialized knowledge such as airspeed conversion. The FTE need not be the technical expert in each of these scientific disciplines but must leverage many of these tools in the course of daily duties and continually grow in the awareness of all. We acquire and sharpen our technical skills through countless hours of academic and hands-on training, but there is so much information about most subjects, one could read and study endlessly. The endorsement strategy presented by the Technical Council below directly addresses technical development and even provides a blueprint of sorts for strengthening this particular leg of the stool. Nevertheless, the science itself is insufficient, because even simple testing has countless subtle intricacies. Situations arise that were never discussed in training and technical ability alone cannot address—this is a need and opportunity we will revisit.

Business
Time, money, and resources are never available in endless supply, and addressing these falls within the scope of business. These business aspects of flight test often creep into the purview of the FTE as experience and managerial responsibility increase. Fortunately, the same tools available to any business allow the flight test professional to achieve profitable, cost-effective solutions. Scheduling our valuable time, managing the assets, and allocating limited manpower are considerations for FTEs at all levels. This leg of the stool also has situations requiring something more than knowledge of business principles.

Management
Test management is already a fairly well-defined topic, but management principles apply to every aspect of daily professional life. The term *management* is difficult to define precisely, but we will narrow our application to the organizational and process-oriented aspects. Techniques implemented to reduce workload, streamline execution, and maximize effectiveness are all examples of this discipline. There are also traditional elements such as schedule and record keeping and organization that are routinely considered as management specialties. Follow-through skills help the young and old FTE alike. Likewise, learning to use calendars and to-do lists are valuable at any stage of professional development.

Leadership
When unanticipated situations arise in any of these areas individually, leadership is the solution, allowing us to apply synthesized knowledge & experience to the problems that arise across all of these domains. It is the ability to select the right piece of information at the right time, to hear the signal in spite of the noise, or to see through haze and focus on the vision. It deserves repeating—it is the critical piece that holds the stool together. FTEs need to focus attention on developing leadership skills as much or more as any of the individual concentrations.

The three-legged stool model can help organize our thoughts about the profession and how we pass the art to subsequent generations. As mentioned, reading is an excellent means for pursuing development and self-directed learning, and this discussion prescribes a strategy to diversify our reading within these concentration areas. Regardless of which books we decide to add to our library, as we read we should seek for principles applying to each leg of the stool and the leadership that holds it together. Finally, we must put it all into practice, in a later issue…

Editor's Note

Two more features appear in this issue consistent with the theme presented above: 1) the Technical Council reports on the FTE endorsement plan, and 2) a book review. We encourage your submissions too: **Send your feedback to the editor or publish your own book review.**

Coming Soon: FTE Endorsements

Preview: In the coming months, the SFTE Technical Council (TC) will establish an **FTE Endorsement Program** to sanction a member's knowledge, skills, and abilities (KSAs) within a specific discipline. Such an endorsement program directly benefits individual SFTE members by recognizing accomplished FTEs wanting to demonstrate professional motivation and career progression, obtain peer recognition, and improve employability. This program also benefits corporate members and industry because it promotes professionalism, identifies experts within our profession, and provides hiring managers key discriminators showing motivation and specialized skills.

Regardless of grade (associate, member, senior member, Fellow), any active SFTE member may apply for one or more SFTE endorsements. An endorsement shows the applicant meets SFTE standards (KSA package) in any one of numerous technical disciplines. To date, the TC identified two dozen disciplines for which KSA packages can be developed (e.g., powerplant, instrumentation, performance, avionics). The standards for each discipline are generally set to recognize FTEs at a level that shows extensive competence within that field. Endorsements are a one-time event with no continuing education or recent experience requirements. At this early stage in the program, the TC developed KSA packages only for flying qualities and Communication/Navigation systems.

For details, the SFTE forum posts the following:

- Complete description of the **FTE Endorsement Program** (policy paper #31),
- **KSA Endorsement Framework** outlining major and minor endorsement categories,
- Standards for earning an endorsement for **Flying Qualities**, and an
- **Application Guideline** to determine how an applicant can meet those standards.

Please visit the forum at
http://www.sfte.org/members-only/community/sfte-forums/122-fte-qualification-and-certification/681-fte-endorsement-program#746

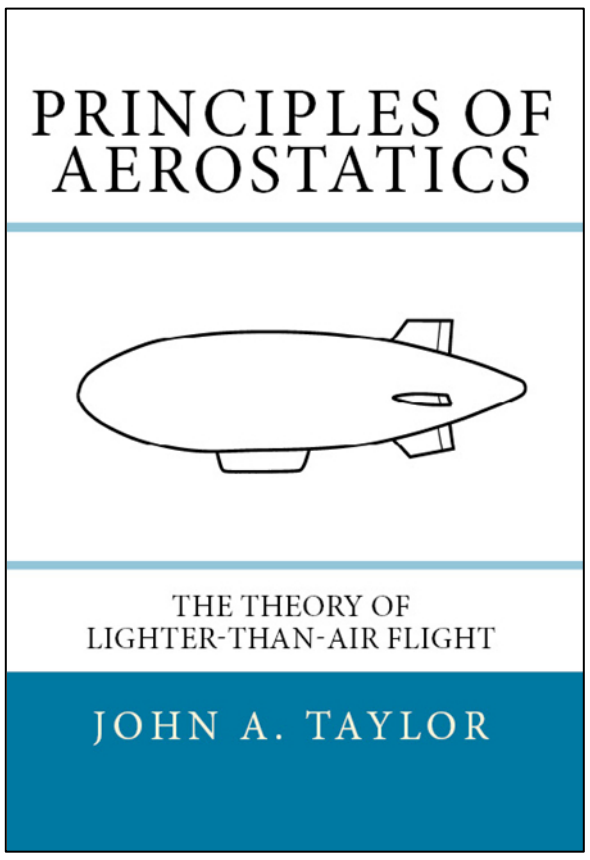
Outlook: If these initial endorsement offerings prove to be successful, the TC will expand offerings, as prioritized by members. A mature program would satisfy the endorsement needs of most or all interested members, potentially including all disciplines identified in the framework.

Your Help Requested: Clearly, no single person or single committee has the knowledge to establish KSA standards for all two-dozen technical disciplines identified so far. Accordingly, an ad-hoc Specialty Discipline Committee will manage each KSA package to be endorsed. This committee will initially establish the standards then will transition into reviewing applicants. We **invite all members to participate in writing the various KSA standards** and/or serve on the review committee (if so qualified). The aforementioned Flying qualities and Comm/Nav standards have already been drafted and are ready now for review, but the others will start from scratch. Please contact the Technical Council chair, Al Lawless, at sfte@alawless.com.

SFTE EC Symposium

Book Review: *Principles of Aerostatics*, by John A. Taylor

By Al Lawless



Principles of Aerostatics is just that, a top-level treatise that gives readers a good sense of lighter-than-air (LTA) vehicle design tenets. It starts with the scientific building blocks and assembles them in enough scenarios to show practical implications for operating LTAs. Furthermore, the author made simple the explanations for various devices such as ballonets and pressure relief valves – not to a detailed design level, but very much for getting a gut feel for the concepts.

After a teaser introduction to basic layouts such as pressure, rigid, metal clad, and hybrid airships, Mr. Taylor laid out his first few chapters so a reader with basic engineering knowledge can align himself with the needed thermodynamic basics. Those who work regularly with engineering units, the classic gas laws, and the standard atmosphere will find the first few chapters an easily-skimmed refresher. Those who never learned or are very rusty will find all the explanations and derivations needed in a nicely condensed format – along with example problems concluding each chapter. This reviewer, although conversant in thermodynamics related to heavy aircraft, roamed life feeling somewhat guilty being unenlightened about vapor pressure and humidity effects. Mr. Taylor assuaged that guilt with straightforward derivations and a short discussion of the impact of ignoring humidity (spoiler alert: 100% relative humidity changes air density by .64% at 15 deg C).

The meat of the book begins with chapters 7 and 8 addressing static lift concepts and prediction. After introducing the fundamentals of gross, static, net and dynamic lift, John drops in little tidbits such as "weighing-off" (adjusting ballast to get the desired heaviness), fuel weight recovery, rainwater collection, and superheating, super pressure, and more. One of the most satisfying sections is that describing ballonets within a pressure airship and how operators manipulate them for climb, descent or trim. It's all quite reasonable and understandable at this top level, and so nice to finally have the correct jargon.

The final chapters, 9 -11, build on the basic knowledge by showing how net static lift can change due to various effects (e.g. atmospheric pressure, superheat, lift gas purity, humidity), what happens during climbs and descents, and "pressure height" limits for LTA vehicles. Throughout the book, the author does the favor of presenting all the math derivations (mostly algebra) along with highlighted summary equations and simplified equations – after explaining the impact of simplifying assumptions. In effect, Mr. Taylor presents a menu of things to consider along with enough discussion for an engineer to determine what is important for any specific calculation.

This reviewer found *Principles of Aerostatics* a nearly ideal text book for its purpose. A reader can work through each & every derivation to really get a deep understanding, or whiz through & accept the final formulas and focus on how they apply. The author also corrects a few common myths to the layman's understand of the LTA world. In short, this book is not only good as a text book in its own right, but also a good complement to SFTEs Reference Handbook. With morsels such as how much lift changes if you heat the lifting gas, it too provides compact reference material for LTA principles

About the Author

John Taylor began his FTE career in 1976 working performance and flying qualities with Hawker Siddeley on the Harrier and Sea Harrier programs. Participation in the ski-jump take-off ramp project in the two-seat Harrier and an assignment to the Pax River AV-8B program led to his immigration to the USA. Joining the US Naval Airship Program at Patuxent River in 1986, he specialized in the flight ops aspects of design review, planning YEZ-2A airship testing, and monitoring Sentinel 1000 airship testing. John also gained flying experience on various commercial blimps. He later became an independent consultant for civilian airship projects.

John was a founding member of the SFTE Technical Council, president of the Patuxent River Chapter, and earned SFTE's 1992 Director's Award. He chaired the AIAA Lighter-Than-Air (LTA) Technical Committee and joined the Airship Association Council. John also organized and chaired two SFTE international technical workshops on LTA issues, chaired an AIAA conference, and presented papers at SFTE, AIAA and Royal Aeronautical Society conferences. When asked about his fondest memories, John reminisced about the many evenings spent in Indian restaurants in Bedford and Dunsfold with the Harrier test team during ski-jump development testing. There was a code of *honour* that required engineers to buy beverages if ever the test pilot had to use water injection during launch because of an underperforming engine, and John bought his fair share.

Principles of Aerostatics is copyright 2014. It is available exclusively from Amazon websites for $24.50 (£17.50 or €22.50) in the US, UK, France, Germany, Italy and Spain (amazon.com, amazon.co.uk, amazon.fr, amazon.de , amazon.it , amazon.es).