

# EAA 663 NEWS

Livermore, California



## Membership Meetings

First Thursday of the month

Doors open at 7:00 p.m

Cookies & Meeting 7:30 p.m

Thursday, March 7, 2019

Presenter: **Trystyn Clark**

**Planning for an  
Around the World  
Flight**

Presentation: ~8:00 PM

Guests Welcome

## Board Meetings

**3rd Thursday of every  
month at 7:00 PM**

March 21, 2019

Location: John Goldsmith's  
House

549 Regulus Rd. Livermore

EAA 663 Chapter Members and some of the members' homebuilt planes July 2018



Bruce Cruikshank and Dorothy Hamilton  
following his surgery  
ready for more smooth landings

**President:**

**John Youngblood**

925- 872-0350

[aqcs@comcast.net](mailto:aqcs@comcast.net)

**Vice President:**

**Chuck Ray**

925-899-5660

[ca4ray2@gmail.com](mailto:ca4ray2@gmail.com)

**Treasurer:**

**Mark Palajac**

510-557-4020

[mark\\_pal@yahoo.com](mailto:mark_pal@yahoo.com)

**Secretary:**

**Kirk Knight**

510-390-0840

[captkirk@woz.org](mailto:captkirk@woz.org)

**Board Members:**

**John Goldsmith**

925-784-2039

[jgold747@gmail.com](mailto:jgold747@gmail.com)

**Tom Irion**

510-773-8485

[tirion@comcast.net](mailto:tirion@comcast.net)

**Ray McCrea**

510-482-5881

[crmccreajr@gmail.com](mailto:crmccreajr@gmail.com)

**William Pitt**

925-337-4220

[wpre123@yahoo.com](mailto:wpre123@yahoo.com)

**Barry Weber**

925-963-0824

[bqweber@gmail.com](mailto:bqweber@gmail.com)

**Gordon Jones**

EAA Technical Counselor 925-447-1549

**Bob Sinclair**

EAA Technical Counselor 925-935-7465

**Trina Anderson**

EAA 663 Young Eagles Coordinator 209-609-2161

**Bob Farnam**

EAA 663 Tools 925-989-5035

**Will Pitt**

EAA 663 Website 925-337-4220

**Kirk Knight**

EAA 663 Newsletter 510-390-0840



**Trystyn Clark-** March Guest Speaker  
Planning for an Around the World Flight



February Guest Speaker Bob Cowan

## EAA Chapter 663 Minutes

FEBRUARY 2019 MINUTES: GENERAL MEETING EAA CHAPTER 663, 2/7/2019, 7:33 PM  
FIVE RIVERS AVIATION MEETING ROOM, KLVK.

Chapter President John Youngblood gaveled the February 7, 2019 meeting to order for EAA Chapter 663 members and guests. Vice President Chuck Ray, Treasurer Mark Palajac and Secretary Kirk Knight pulled out the chocks to get things rolling. Thirty-nine members and guests were in attendance.

Chapter 663 meetings warm up about 7:00PM with the practice of showing the ~20 minute monthly EAA Chapter Video produced by EAA HQ in Oshkosh. Most of the featured content is not available online. Members and guests can arrive at 7:00 for ad hoc discussion, as the audio track is kept low enough to be heard but not to interfere. Often people will turn to watch something of interest in the video.

**GUESTS:** Evgeny Gubin, drove from Hayward but is originally from Russia and has been in the US for three years. He's a new EAA Member who started a YouTube channel about building your own aircraft. His goal is to build his own aircraft in one year. He's deciding between the Zenith CH750 or Vans RV-12. He went to Missouri to talk with the folks at Zenith, but would like to talk to builders who know the airplane for their experiences.

Many members stepped forward to offer insights to Evgeny on Vans aircraft. Some brought up Bruce Cruikshank who built a 750 and is having surgery tomorrow (*ED: Successful outcome!*). Evgeny started building an RV-10 tail cone but soon discovered it would take a long time, he's impatient and in a hurry! He also started building a CH750 SuperDuty but had problems with kit holes in the wrong place. John Youngblood acknowledged that is not uncommon across kits – and there was knowing laughter throughout the room.

Andrew from San Francisco was our other guest who has been a glider pilot for 7 years out of Byron and power pilot for one year. He's planning to build a toolbox and buy an RV. He's



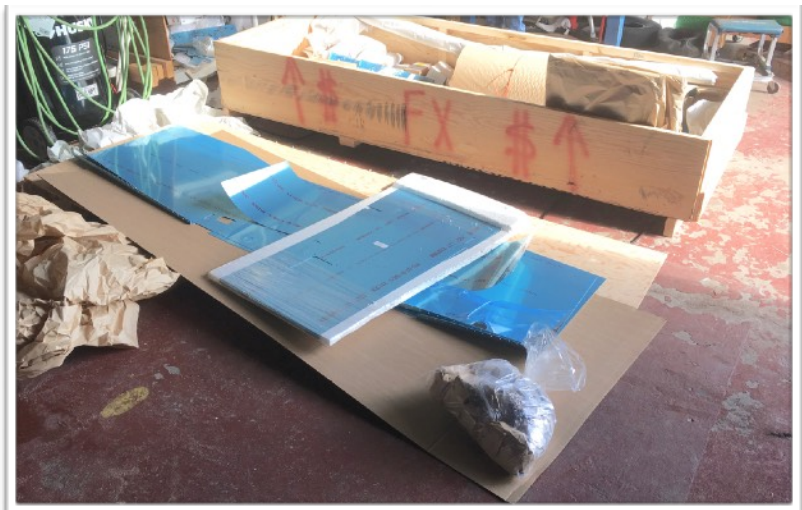
flown RV-6's, 7's and 8's and likes what he's flown. He'd heard there are a lot of RV nuts in the Chapter and came from work in Palo Alto to be here. Members in attendance admitted he was surrounded by RV nuts. Kurt Haller acknowledged that a toolbox could be built and finished in less than a year.

**ANNUAL DINNER RECAP:** John asked for comments about the annual dinner that took place on January 19<sup>th</sup>. Many complimented the excellent food with special commendations and consistent applause to Jan DeVocht who went beyond expectations with appetizers!

There were many awards that evening, but one couldn't be given out at the banquet the MVP award. That is, Most Venerable Person award for years of contributions from Harry Crosby for supplying the always enjoyable wine for our annual dinner.

### **NEWSLETTER and MINUTES:**

Kirk is soliciting stories about recent flights, ADSB suggestions as 2020 is right around the corner, insights from your first or your 30<sup>th</sup> BFR. If you have photos, stories you want to tell (record it with your iPhone voice memo and I'll transcribe), videos, lessons learned or other items of interest kindly send them to [captkirk@woz.org](mailto:captkirk@woz.org). The Secretary always appreciates that members are closely reading minutes for accuracy and enjoying the newsletter.



Vans RV-14A Fuselage kit inventory - \$\$\$\$

**TREASURERS REPORT:** Mark Palajac reported he had many members step forward this evening with checks to renew, but those aren't yet on his books. He shows \$2,744.52 in the bank after paying to rent the hall for the annual dinner. Due to the government shutdown NASA owes the Chapter \$1,700 due to their cancellation of astronaut Rex Walheim. We'll also have a refund from the hall of \$820.00. That will bring our balance well above \$5,000.

Mark shows 56 members have paid for 2019 membership, that's in addition to 10 lifetime memberships and expects a total of 80 based upon past years. He recounted we had 64 paid attendance for the dinner. We didn't break even but it resulted in a \$896 net loss. Over half of the total costs of \$3,446 are for food and wine. Catering was \$1,720, Appetizers \$200, Wine \$350, Decorations \$150, Hall \$820, Paul Dye (speaker) expenses \$206. Gross receipts were \$2,550.

Paul Dye enjoyed the evening after being called to fill in on a mere 10-day notice.

Mark reminds everyone to forward the names of spouses and significant others so he can send out email invitations to Chapter functions such as BBQs and Annual Dinner. **Mark is**

**accepting \$30 payment for 2019 memberships. Bring your checkbook to the March Meeting for membership.**

### **YOUNG EAGLES:**

Our superb Young Eagles Coordinator, Trina Anderson, had some awards that were not presented at the Annual Dinner. Pete Sandhu of Five Rivers Aviation was presented with an award that was misplaced at the dinner. John Youngblood had a correction in the number of flights. Dave Anderson also had corrections due to Flightsquid being disabled. Trina counted 110 Young Eagles total, with 50 out of Tracey, 54 out of Livermore and 6 out of Oakdale. Dave flew 26 in the RV-9A.

She also presented recognition awards for Trystyn Clark for Ground Crew, Jeffrey Larson for Ground Crew and Eagle Flight volunteers Nick and Robyne Teslich Eagle awards, too.

Trina is setting up a blue box in the back of this meeting room with handouts for Pilots and Young Eagles so you don't have to wait for events. If you have someone who wants to fly, pick up some blank registration forms and follow the instructions. There is also info for new pilots. Same for Eagle Pilots. The child safety program is for 3 years, and this is the third year. If you're new you'll need to take the online training and certification.

New this year are the AVIORE comic books. It's about aviation, how planes work, and stuff to do while they're waiting for their flight.

She's prepared a schedule for 2019 Young Eagle events: **(More on BBQs next month)**

April 13, 2019	KLVK
May 18, 2019	KTCY
June 8, 2019	KLVK
July 13, 2019	KTCY
August 17, 2019	KLVK
September 14, 2019	KTCY

Trina is encouraging Chapter pilots to arrange your schedule and let her know. If you need help call or email Trina 209-609-2162 [DNTAnderson@gmail.com](mailto:DNTAnderson@gmail.com)

**New in 2019** is the **EAA Young Eagle Scholarship** program worth \$10,000 for each youth to obtain their PPL or \$7,500 for Sport Pilot license or \$5,000 for Glider ticket. Dave Walters has been assisting Trina with digging out information on this and filling out the applications. The Chapter needs to be approved first, which should be easy based upon our long success with Young Eagles events.

When we have our first applicant candidate, we are responsible to help them successfully become a licensed pilot within 1 year before we can add more applicants for the Scholarship. The \$10K comes to the club with 30-40% front loaded. We are responsible for dispersing to the CFI and flight program over time. The beneficiary of the Scholarship must also donate an average of 2 hours a month to chapter activities related to our charter, e.g. Young Eagles. The beneficiary must complete the program before their 19<sup>th</sup> birthday.

The core donation to support this special program is from the late James. C. Ray, a decorated WWII B-17 pilot who went on to numerous successes while quietly donating millions across many decades to programs enabling young adults to become pilots. He often said he lived life fearlessly, and he did so for 94 years.

<https://www.aopa.org/news-and-media/all-news/2017/april/04/philanthropist-james-c-ray-lived-life-fearlessly>

Trina wants to give more seventeen-year old's an opportunity to fly before they "age-out" of the Young Eagle program. You can also ask questions or find instructions on the Chapter's Slack discussion site. **eea663.slack.com**



*Dave Walters sketch of Half Moon Bay Fly-in  
3 Zero Cafe*

The Chapter 663 Board will be discussing suggestions to improve access to more Young Eagles, especially those who show interest in further exploration of aviation interests, by introducing them to an inspirational flying experience. Note: Young Eagles is for ages 8-17.

Also, Trystyn Clark brought up a \$2 million scholarship fund that also includes ATP ratings! NGPA – National Gay Pilots Association has \$2 million in scholarships.

**TOOLS:** Bob Farnam has no new tools. John thanked him for helping Harry with the wine at the banquet.

**WEBSITE:** Will Pitt is taking over from Brad Olson with new software and a growing website. Here's current progress. <https://www.663.eaachapter.org>

**BOARD MEETINGS:** Next Board Meeting is scheduled for February 21<sup>st</sup> 7:00PM at the home of John Goldsmith in Livermore. Email John Youngblood for meeting address, all are welcome.

**MARCH 2019 Chapter Meeting** will be on March 7th at 7:00PM at Five Rivers Aviation Livermore Airport. Speaker will be Trystyn Clark on preparing for a round the world flight.

### **AOPA FLY IN**

There was a brief summary of the AOPA fly-in at KLVK scheduled for June 21-23<sup>rd</sup>. Of the three days, the first 2 days of events will be open to the public on Friday and Saturday June 21<sup>st</sup> and 22<sup>nd</sup>. Space will be provided for 60-70 exhibitors, with as many vintners who can fit.

It will be a similar footprint to the 2018 Open House. They're preparing for 300-700 planes, dependent upon weather.

The plans include aerobatic demonstrations, a night drone demonstration, a Valdez-style STOL competition on taxiway Alpha, with grandstands for viewers set up on the edge of Juliet. A camping area will be set up near the first station. Overflow parking will be on taxiway Lima as well as 25L.

EAA members will be invited to volunteer to help marshal aircraft similar to the Super Bowl. AOPA provides T-shirts and more importantly food! The airport will be closed at night except for tenants. One consideration for why this is important to pilots is that it builds good relationships with the non-flying community by bringing in tourists who can appreciate the quality of our local products, especially wines. Our neighbors and political leaders see the value of an airport and how it adds enhances the image of our area.

More information will be provided at the March meeting.

**POLO SHIRTS WITH EAA 663 LOGOS:** First shirt is \$10 for members; all other shirts are \$22. Ask Mark Palajac.

**FLY-OUT EVENTS:** Dave Walters is helping organize weekend fly outs. He's contacting other EAA Chapters such as 512. The goal is VFR flights so everybody can participate. Slack is a useful resource with the goal of organizing a couple weeks beforehand, but there are last minute changes due to weather. [eaa663.slack.com](https://www.eaa663.slack.com)

**NEW FEBRUARY FLY-OUT** – KAUN (Auburn) 16 February 2019, LVK>AUN = 83NM, 1539'MSL, 2500'TPA, 07/25 @3700'x75', ASOS/AWOS - 119.375 (530-888-8934), CTAF - 122.70, FSS - 122.60, Class G.

We will meet at Wings Grill (mid field) at 1100 hrs. Plan your flight times accordingly! Please respond to **Dave Walters** of your intention to join us ([grayson\\_segal@yahoo.com](mailto:grayson_segal@yahoo.com)) or 925/348-3584.

You will get the last update about this event by 0800 hrs. on 16 February. Anything other than VFR conditions will scrub this event and it will be rescheduled for the following Saturday, 23 February.

Dave is investigating a flyout to Columbia. It may be too early in the year and IFR conditions. Adjacent to the airport is Columbia State Park and the Fallon Theater next to the ice cream store. They offer performances at the Theater for which Dave can help reserve seats.

Dave also brought a coffee carafe that's in the back of the room to accompany our cookies. He also has some decaf for those who prefer lower octane.

**Hayward Air Rally** is coming up May 16-18. Dave described it as an aeronautical gymkhana. Note they have with and without electronic assist!



## DISCUSSION:

**Kurt Haller** had an important story. His **RV-9A** just completed its DAR inspection January 21, 2019 and it is now an official FAA certified homebuilt aircraft. But Kurt had gnawing concerns he, and the DAR, may have missed something important.

So, he wisely invited Barry Weber and Gordon Jones to come over for the real inspection. Vick Syracuse, EAA Homebuilt Council Member has a reminder – jamb nuts! Sure enough, they found one missing on the right aileron. Kurt needed to unburden his conscience in the quest for both safety and perfection and revealed they found a second squawk – safety wire! There was a difficult to reach nut on which the safety wire was installed backwards.

But Kurt's pièce de résistance – what about the electric elevator trim control buttons? Barry, "Are you pushing down?" Kurt, "Yes I'm pushing up." A bit more "What did you say?" revealed the problem was solved by reversing two wires. It seems this is a common problem with electric elevator trim controls that requires some counter-intuitive thinking!

Kurt was rewarded with extended applause, and more than a few cheers, for not only completing his plane, but sharing how to make our planes better. Now he's off to work on his transition training before there is a first flight. When will there be a first flight? Kurt listened to advice of many, including Paul Dye at the Annual Dinner, "Keep it a secret until it's complete!"



February 2019 Guest Speaker  
Bob Cowan & his 500+ hours RV-7A "Doris"

**Tim Roberts** is a member of EAA Vintage Aircraft Chapter 29 in Hayward as well as 662. He's building an RV-12. One of the 29 members just completed a Carbon Cub with a 340. Mark Galberry is the builder and he'll be giving a talk next

Thursday (February 14) at the Hayward Terminal 7:30PM and if weather permits, he'll have the plane outside. Mark also built and RV-4 and flew it across the pond to England!

**Jeffrey Larson commended VP Chuck Ray** for all the effort he has done pulling in compelling guest speakers. Negotiating with NASA, and then having to pull in a replacement of the level of Paul Dye was quite a challenge and quite a success. Applause that could be heard above a J-58 at full afterburner saluted Chuck. (*ED: see a list of our guest speakers starting in January 2018 in this newsletter.*)

**MEETING BREAK 8:22 PM**

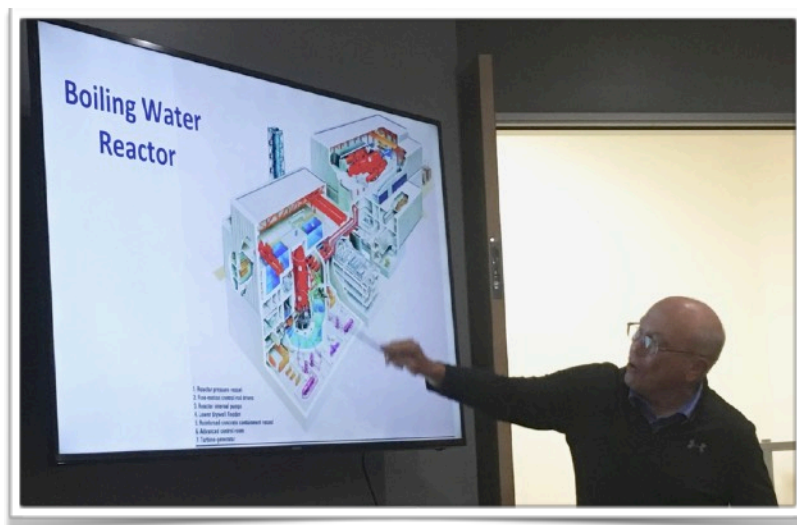


**MEETING RESUME: 8:35 PM****GUEST SPEAKER:**

Chapter Member **Bob Cowan** gave a presentation about his experiences from engineer through Chief Technologist at the Nuclear Energy Division of General Electric. The theme of the talk was that ingenious new ideas for fixing a problem often lead to an unexpected new problem. This can also be applied to homebuilt airplanes.

For the next 45 minutes Bob held the audience in thrall to a subject outside the normal topics. Bob joked we'd be tested at the end about the meaning of radioanalysis, transmutation, isotopes and electro-chemical potential. Because he knows his topic, he was

able to describe these in very simple terms such that the concepts and the problems he presented were understandable even if not mastered.



Bob Cowan explains reactor basics

Like any good mystery, Bob started by introducing the antagonist, his boss's boss sitting down in Bob's office and demanding, "Your water is ruining my reactor! Get it fixed quickly! Don't spend much money." Bob had only been in this job 6 months, and he was a junior guy on one out of 5 teams handling water, so Bob immediately made plans to go to a bar, because this is not an easy problem.

A bit of backup. Highly pure water is key to running a reactor. The water measurement of electric conductance is called a microsiemen. Distilled water is about 1 microsiemen. Water in a reactor is 0.056 microsiemens. Reactors use a lot of very pure water to cool the reactor via one loop, but they also use water in a second independent loop to generate electricity via steam turbines. There are miles upon miles of water pipes in a reactor so corrosion in those pipes is very, very expensive.

Since water is critical to operation of a nuclear reactor the purity of water is critical to corrosion. Bob is a metallurgist specializing in the interface of metals and water: corrosion.

They were having high rates of stress corrosion cracking in stainless steel pipes. The typical size is 12" diameter, with 1" wall thickness. It's under 1,000 PSI pressure at a temperature of 550°F.

Cracks require repairs and that leads to other problems. Even when the pipes are shutdown there are high radioactive dosage rates. A typical dosage may limit the exposure time for a welder to 10-15 minutes. The better the design the less radioactivity the lower the costs.

Water has fast neutrons, gamma rays and slow neutrons. Radiation knocks water molecules apart into oxygen  $O_2$ , hydrogen  $H_2$  or peroxide ( $H_2O_2$ ). The first two are stripped out by the steam. You're left with hydrogen peroxide with a real high electro-chemical potential in contact with stainless steel. Bob simplified it and calls it "oxidizing conditions." Add those with heat affected zones and stress and you've got stress corrosion cracks – something we don't want.

Bob referenced le Chatelier's principle (*"when a change in pressure, temperature, or concentration of a reactant is applied to a system in equilibrium, the equilibrium will shift so as to tend to counteract the effect of the constraint"*). So, one of the engineers on the team suggested, "Why don't we just add excess hydrogen to the feedwater so this equation runs backwards?" The team laughed at the idea of adding hydrogen to this huge flask (45' in diameter by about 65' tall) of boiling hot water known as the reactor. What could go wrong! (Hint: Hindenburg.)



Bob Cowan passed around some of their handiwork from the inside of a reactor

It turns out that nuclear plants already use large tanks of hydrogen, so they know how to handle it. It also became clear that if you add enough hydrogen you would get reducing conditions. The  $H_2$  does get stripped out but you're left with very little oxidizing species. More importantly, when you measure the electro-chemical potential you find very reducing conditions and there's one potential, if you go below it, you don't get cracking.

So, we did 64 tests, adding  $H_2$  in different amounts. But the radiation in the turbine building increased 4-5x above background radiation. Why did that happen? Well the water  $O_2$  oxygen molecule gets banged with a neutron, absorbs the neutron, kicks out a proton, and all of a sudden, it's a nitrogen atom. The nitrogen atom has a choice, if it's oxidizing situation it's  $N_{13}$  but if it's reducing conditions it's ammonia  $NH_3$ . There isn't much ammonia, but it can be measured by the creation of an  $N_{16}$  molecule.

Bob pointed to a chart that compared the stainless-steel pipe with what's happening with several metals including platinum. Somehow, they needed to convince management to build a plant out of platinum pipe!

What if you could make the reactor think it's built out of platinum? They electroplated a sample with platinum and ran some tests. One approach was an alloy with 0.5% platinum. They devised a plasma spray device that would be inserted deep inside the reactor to coat those welds that were susceptible to cracking. Curiously, only some welds have this problem, and they developed data to find those. The problems are not at applied stresses, but the residual stress area of the weld. About 1 out of 1,000 welds gets stress corrosion. However, there are a lot of welds and you don't know which one is going to go.

At the same time one of his staff, a PhD from Cambridge, came up with another idea. His idea was to add a water-soluble platinum to the water to have a little bit of plate-out and just make the whole surface platinum. Bob had pictures of 4nm platinum particles on the surface, equivalent to one atom layer of platinum. About one microgram per centimeter square of surface. Noble metal chemical addition is what it's called.

Reactor operators are very conservative about new ideas, so it took a while to get a guinea pig to be first. Many offered to be seventh, joked Bob. Eventually it worked quite well.

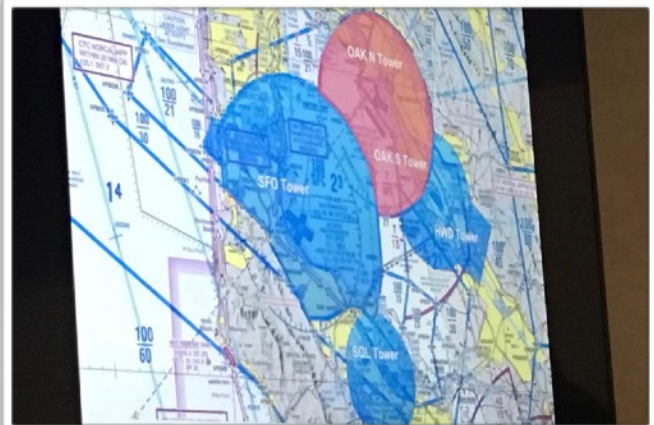
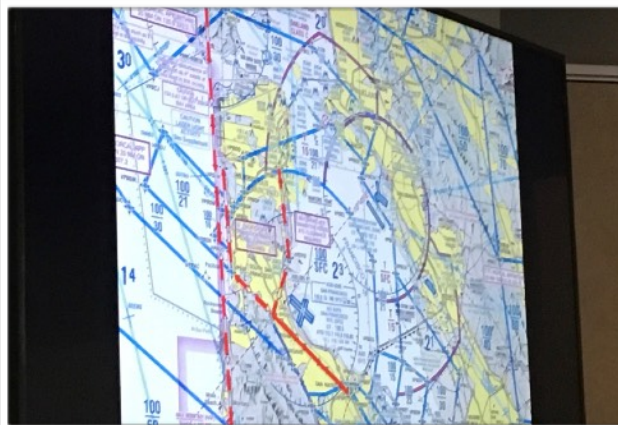
This is about 1/3 of what Bob presented, during which members were transfixed with the processes and the various problems that arose. We had enough physicists in the room to kibitz, but even they learned something. There are always lessons to be learned about problem solving - (*ED: root cause analysis is your friend*)- and bad outcomes to be avoided.

Bob covered a couple more such challenges and then turned to the earlier comment about increased radiation and the challenges of reducing radiation. Highly radioactive cobalt 60 was forming in the breakdown of nickel in the pipes, and then becoming part of an oxide film, especially on the pumps. This resulted in increased human exposure above acceptable levels, as people had to limit their time working in hot areas. The hero wasn't an exotic metal such as platinum, but an exotic isotope of zinc in minute quantities worth about \$20 a gram.

Bob demonstrated his skills as a talented sleuth who told several mysteries where he was among a team of detectives and not the hero. The evening was quite informative, compelling and entertaining, ending in sustained applause.

**MEETING ADJOURNED** by John Youngblood. 9:21 PM

Minutes reported by Secretary Kirk H. Knight.





## EAA Chapter 663 Guest Speakers Past, Present and Future

Date	Speaker	Subject
January Mtg 2018	Steve Randall	Ferry Pilot, Airline Pilot, Author "Rubber Suits and Lukewarm Soup"
2018 Annual Dinner	Alan Brown	Program Manager F-117 Stealth Fighter
February 2018	Larry Suter	Glider instructor, NorCal Soaring Club, Soaring Society of America
March 2018	Mark Epperson	USS Hornet Aircraft Carrier Museum - Alameda
April 2018	John Oldham	Pipistrel Alpha Electric Aircraft - San Joaquin Valley Clean Transportation Center
May 2018	Pete Ford	Flying the F-15 Eagle, Aviation safety process management
June 2018	Larry Fish	Back country flying
July 2018	James Kaschmitter	Secrets of Lithium Ion Batteries
August 2018	Dan Dryer	San Carlos Flight Center CFI - Improve your landing techniques
September 2018	Barry Weber	Airventure 2018 videos and pictures
October 2018	Rich Perkindw	Flying the BD-5J
November 2018	Barry Weber	Airventure historical photos - eXperimental planes you forgot
December 2018	Lew Jennings	Cobra helicopter pilot Vietnam, author "19 Minutes to Live"
January 2019	Dan Dryer	San Carlos Flight Center CFI - Flying the New Bay Tour
2019 Annual Dinner	Paul Dye	NASA Space Shuttle safety processes for home builders and pilots
February 2019	Bob Cowan	Problem solving for nuclear reactors and homebuilding
March 2019	Trystyn Clark	Planning for an around the world flight
April 2019	Peter McCutcheon	406 ELT systems and survival techniques
May 2019	Ken Bower	Sofia Program - Stratospheric Observatory for Infrared Astronomy
June 2019	Dan Linehan	Author of "SpaceShipOne"

EAA Chapter 663 meeting cover many compelling subjects that stimulate our imaginations as well as our emotions. Our guests have shared the thrill of flying an F-15 during a live fire air-to-air exercise, repeatedly ferrying a single engine prop plane over the North Atlantic, improving our rusty landing techniques, flying the world's smallest jet, flying a helicopter in combat in Vietnam or becoming one with the air in a glider over the Sierra.

We looked back to history embodied at the USS Hornet, as well as at AirVenture 25 years ago when X meant scratch built experimental, plus our annual Oshkosh updates that explore details and emerging trends.

We've been fortunate to discuss details with global leaders in stealth technology, uncover mysteries of metallurgy in nuclear reactors and expert secrets of lithium ion batteries that could save your life.

Many of our guests are literally presenting over the horizon or out of this world technologies in space and aviation such as a fleet of electric powered planes for flight instruction, the Space Shuttle, or a telescope observatory at 50,000 feet.

Our guests speak on safety as a foundation built upon rigorous processes while our meetings provide opportunities for members and guests to share insights and lessons-learned that benefit pilots at all skill levels.

## Fly Out Survey

by Dave Walters  
Choose your top 10

Location		Distance (NM)	Airport MSL	Runway (length)	Picks
Half Moon Bay	KHAF	35	66'	5000'	_____
Lodi	103	35	59'	3574	_____
Nut Tree	KVCB	41	116'	4700'	_____
Watsonville	KWVI	45	163'	4500'	_____
Sac Exec	KSAC	50	23'	5503'	_____
Mather AFB	KMHR	57	98'	11301'	_____
Woodland	041	58	125'	3769'	_____
Los Banos	LSN	59	121'	3801'	_____
Salinas	KSNS	62	84'	6004'	_____
Castle AFB	KMER	63	190'	11802'	_____
Columbia	022	69	2120'	4673'	_____
Auburn	KAUN	83	1538'	3700'	_____
Willows	KWLW	111	141'	4125'	_____
Lake Tahoe	KTVL	112	6268'	8541'	_____
Harris Ranch	308	116	470'	2820'	_____
Truckee	KTRK	126	5901'	7000'	_____
Bridgeport	057	128	6471'	3854'	_____
Quincy	201	141	3418'	4105'	_____
Red Bluff	KRBL	148	352'	5431'	_____
Oceano	L52	167	14'	2325'	_____
Delano	KDLO	170	316'	5659'	_____
Shelter Cove	0Q5	176	73'	3407'	_____
Kern River	L05	202	2614'	3500'	_____

August 2018