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Preliminary FY 86 Budget - Aircraft Carbon Monoxide Study

Line 100 Personnel Costs

A.	1 Medical Officer (project coordinator)		
	Base 5744.00 mo. + benefits at 25% = 7175.00 mo. x 12 mo.		86,100.00
B.	1 Part Time Clerk Typist	1792 27% Com = 13652	13,000.00
		5894 30% Com = 9,946 Actual Salary	
			<u>13,000.00</u>
			Total Line 100
			\$ 99,100.00

(Salaries based on current salary schedule in effect on 6/30/85)

Line 200 Travel and Per Diem

Airfare to Testing Sites

Fairbanks	2 trips, 2 people, 3 days each	888.00
Bethel	2 trips, 2 people, 2 days each	1,072.00
Nome/Kotz	2 trips, 2 people, 5 days each	1,704.00
Barrow	2 trips, 2 people, 2 days each	2,400.00
Valdez	2 trips, 2 people, 2 days each	800.00
Juneau, Sitka, Petersburg, Wrangell	2 trips, 2 people, 6 days each	2,800.00

Per Diem Total

80 days @ 95.00 per day + \$500.00 misc.	<u>7,300.00</u>
--	-----------------

Total Line 200 \$ 16,964.00

Line 300 Contractual

Blood Testing (3,000 tests @ 10.00 per test)	30,000.00
Telephone (\$500.00 per mo. x 12 months)	6,250.00
Printing Costs (Brochures, pamphlets, letters, etc.)	5,000.00
Shipping for supplies + postage	3,000.00
Advertising (radio, newspaper)	10,000.00
Nurse	25,000.00
Data Programmer/Analyst	<u>50,000.00</u>

Total Line 300 \$129,250.00

Line 400 Commodities

Supplies	
\$3.00 per test for supplies x 3,000 patients, x 1 test	\$ 9,000.00
Office Supplies	<u>2,000.00</u>

TOTAL LINE 400 11,000.00

Line 500 Equipment

2 C-02 Ecologizers for testing levels	10,000.00
1 IL 282 Coaximeters	<u>15,000.00</u>

TOTAL LINE 500 25,000.00

TOTAL ESTIMATED COST--ALL LINES -FY 86 \$ 281,314.00

POSITION PAPER

HOUSE BILL NO. 379

For "An Act making a special appropriation to the Department of Health and Social Services for a study of the effects of carbon monoxide and providing for an effective date".

This bill provides for an indepth study of the effects of carbon monoxide on people. Initially, the target group will be airplane pilots and their passengers. A limited initial study has demonstrated there is a potential problem. When the occupants of 55 different aircraft were examined it was found 12.7% (7) of the aircraft had exposed the passengers to increased levels of carbon monoxide.

This study hopes to look into the relationships of elevated carboxyhemoglobin levels and stress demands on judgment, rapid neuromuscular activity, and sensory orientation and coordination as exacerbated by altitude.

Funding for this project does not appear in the Governor's budget.

Recommended by: Robert I. Fraser
Robert I. Fraser, M.D.
Director
Division of Public Health

Date: 4/23/85

Approved by: John R. Pugh
John R. Pugh
Commissioner
Department of Health and
Social Services

Date: 4/24/85

'Operation Vampire' is a success, CO testing offers help stopping accidents



The K.I.S.S. -- "Keep It Safe Service" -- is a regular column appearing in Air Alaska.

The Vampire Report

Well, we asked for it, and we got it - thanks to your help. "Operation Vampire" was a great success - once we moved down to where we could catch you at the fuel pumps! (Thanks to Mike Spernak and Ramona Ardaiz for permission to clutter up their lobbies and bug their customers - we had only a few gripes about having to pay in blood!)

Just in case you've been in Hawaii for the last couple months, I'll explain. Operation Vampire is the name the 99s and the Airmen gave to a project on which we agreed to help out. The State Epidemiologist, Dr. John Middaugh, of the Division of Public Health, had been studying the effects of carbon monoxide in several areas of concern, among them aircraft accidents. He wanted to do an analysis of the blood of a reasonably large sample of pilots who had just flown. Would we help?

So we set it up for the weekend of March 2 and 3, planning to use the ACC Aviation Complex ramp for the heavy load of volunteers lured in by all the publicity - and by concern for their safety. The MRI ATIS reminded incoming pilots of the location of the testing site.

However, we really did have to go snag pilots coming in to refuel. Surprisingly, we only had two people - one pilot and one passenger - turn us down cold. No way no needle no how. But the sample was large enough, and after all, this was supposed to be a volunteer pro-

ject.

The final report, titled "Carbon Monoxide in Pilots and Passengers in General Avia-

tion," is dated March 21, 1985. A total of 55 aircraft were tested, and 95 pilots and passengers. We got two blood samples from most volunteers, as a control. Another important control, albeit serendipitous, was that we had several aircraft in which only one person is a smoker, though none actually smoked during flight. The non-smokers showed a much lower level of carbon monoxide in their blood than smokers.

It is important that the limitations of the study be noted. For instance, it would have been ideal to have a blood sample of each volunteer before as well as after the flight, to measure the change (if any) precisely. However, there are limits - we probably wouldn't have had any volunteers at all! Dr. Middaugh did get a short questionnaire from each volunteer - how long the flight, smoker/non, etc., for use in working up the statistics.

The equipment used to measure the carbon monoxide levels (carboxyhemoglobin levels, actually, or COHb for short) was borrowed from a lower 48 lab, and laboratory testing was done at Humana Hospital. It was interesting to Dr. Middaugh that the baseline (the average COHb level of people who had no significant exposure to carbon monoxide - sorta like background radiation) of the study was 1.5 percent or half the generally accepted figure for normal.

Until now, the testing equipment could only say "3 percent or less," since it couldn't accurately measure less - so 3 percent was accepted as normal.

Doesn't appear to be, however, with improving technology

See KISS PAGE 14

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able to measure much lower levels.

To quote from the report: "... of the 95 individuals we tested, 9 were smokers, 86 were non-smokers. Excluding the smokers, 9 individuals whose carboxyhemoglobin levels exceeded 2.5 percent COHb were identified from 7 different aircraft. (Figure 2)

The number and type of aircraft flown by the individuals we tested are listed in Table 1. The pilot of one aircraft (PA-28) was tested twice. The 7 aircraft in which non-smoking pilots or passengers had elevated carboxyhemoglobin levels are listed in Table 2, along with the duration of the flight and the actual levels of carboxyhemoglobin among the occupants. None of the 9 smokers with elevated COHb levels had another identifiable source of CO exposure.

"The carboxyhemoglobin levels of the pilots were plotted against the duration of their flight (Figure 1). An elevated carboxyhemoglobin level of 3.2 percent was discovered in an

individual who flew only 40 minutes. Among non-smokers, the three highest carboxyhemoglobin levels (4.2, 4.5 and 6.5 percent) were in pilots who had longer flights of 2-3 hours.

"Smokers had carboxyhemoglobin levels considerably higher than non-smokers. In six aircraft, other non-smokers in the aircraft had normal COHb levels. One pilot who was a smoker had a low COHb level (0.8 percent). No one smoked during his flight.

"Two pilots who were smokers flew alone; their COHb levels (4.0 percent, 4.3 percent) were lower than the COHb levels of the five other smokers who shared aircraft with non-smokers who had normal COHb levels.

"The pilots of the 7 suspect aircraft were notified of their results by telephone and were advised to have their aircraft checked by a qualified mechanic. One pilot discovered that his exhaust manifold was improperly attached, causing exhaust leaks at the gaskets. This individual's plane had major mechanical work 80 hours prior to his being tested. The pilot

also used a carbon monoxide detecting disc that had turned positive during his 40-minute flight from Wasilla to Anchorage."

Let's take a closer look at the graphs. Figure 2 is a raw plot-COHb of pilots only, against time of exposure. The circled dots represent smokers, the naked dots non-smokers. First, note that most samples fall between 1 percent and 2 percent, no matter how long the flight.

The pilot represented by the dot I've marked *, at 1.5 percent after 5 hours, can be sure his airplane has no CO problems. But take a look at ** - 6.5 percent is getting up there. What about + and ++ and +++.

Granted that they are all smokers, those are still higher levels than other smokers on the graph. How can one be sure

that it's cigarette smoke and not the airplane producing the high COHb level?

That's where Figure 1 comes in. It includes pilots and passengers. Note that the plot is now COHb level against aircraft. The arrows at the bottom of the graph indicate problem aircraft. The straight vertical lines between dots simply tie together the people in one aircraft. Now it becomes a tad clearer, since several of the smokers were flying with non-smokers, with normal levels.

There's more to it than that, of course, but if you study the graphs you can get the indication of some of the information available in even a small statistical sample.

It was not surprising that elevated COHb levels were found, but that it was found in a high percentage of aircraft tested. 7 out of 55 - 12.7 percent - is a large percentage. (Elsewhere in this issue, look for an article about what the 99s and the Airmen are trying to do about it).

So why is the epidemiologist from the Division of Public Health interested in carbon monoxide in pilots? So why not? (I'm glad someone is!) Epidemiology is more than the study of outbreak of tuberculosis and hepatitis. The recent study of those ubiquitous killers and maimers, the three-wheelers, was initiated by the same epidemiologist, Dr. John Middaugh.

Whether from disease or accident, any high number of deaths or injuries in similar circumstances can rightly be classified as epidemic. Since disease and "accidents" can, in most cases, be prevented, epidemiology looks for the

causes, whether a virus or manufacturing defect, and most likely recommends preventive measures. It is for other agencies, whether through prevention or enforcement, to act on the information. First, however, the information must be there.

So far, there hasn't been a lot of work on carbon monoxide as a problem at lower than lethal levels in pilots or motorists. FAA & NTSB statistics shed some light on fatal accidents, but not many pilots get a blood test for COHb level after a ground-loop or a hard landing. What Dr. Middaugh is looking at opens up a whole bagful of questions.

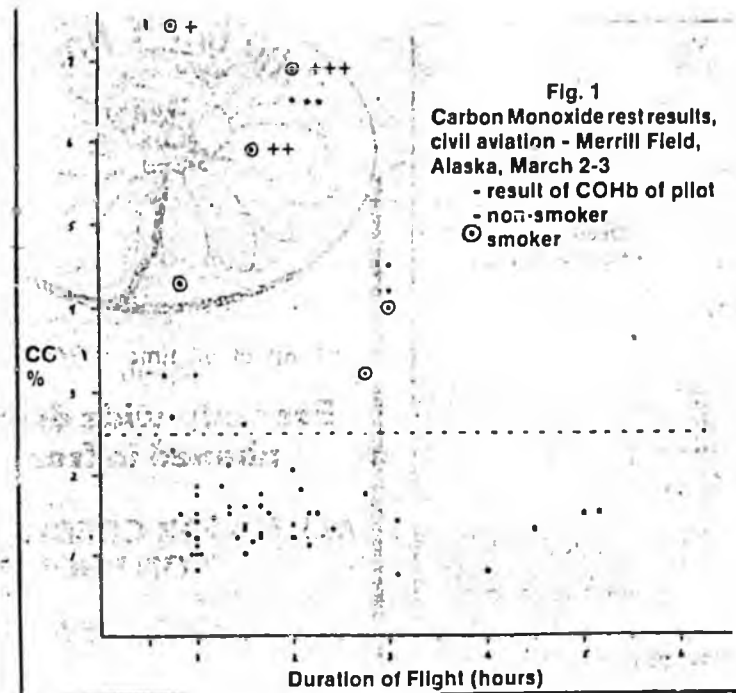
How many "pilot-error" accidents are caused by pilots in whom elevated COHb levels lead to impaired judgment, impaired sensory orientation, impaired coordination?

How much is too much? As noted for years "normal" has been considered to be 3 percent COHb. "Normal" in Dr. Middaugh's study looks like 1.5 percent. If the "normal" is found to be lower than previously recognized, does that also mean that scientists need to revise their thinking about the level at which "impaired" may start?

The effect of carbon monoxide depends on several factors, among them ones physical condition. In a person with a physical problem which impairs circulation, even a very low dose of CO can kill. A pilot with undetected heart disease could die from a 3.0 percent COHb, if the circulation in the heart muscle is sufficiently impaired that small amount of CO triggers a heart attack. A very

common cause of impaired circulation, of course, is simply age. Again, how much is too much for whom?

In pilots, altitude's contribution to the problem is extremely important. Carbon monoxide is such a potent poison because



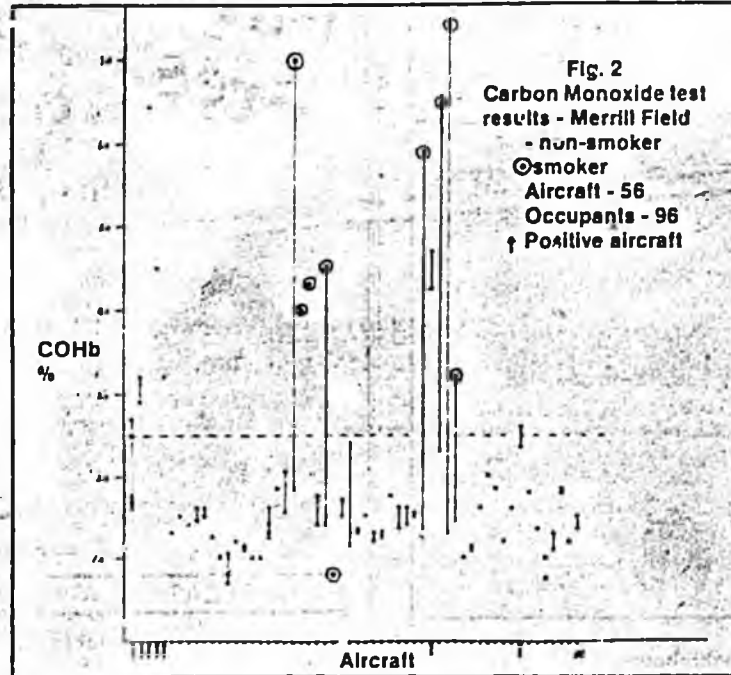
• K.I.S.S. - COHb study results

Continued from Page 15

of the way it works in your body. We all know that we need oxygen to breathe, that our lungs take the oxygen from the air and get it into the bloodstream. The kicker with carbon monoxide is that it is 200 TIMES MORE ABLE to latch onto your hemoglobin (which is the oxygen carrier) than oxygen.

At higher altitudes the amount of oxygen available is less. If CO is present in even small amounts, it has an even easier job of latching on to your hemoglobin. At altitude, what COHb level will impair a pilot's ability? Exactly how much? How much impairment can lead to disaster?

How do we find out for sure where the problems lie? The little carbon monoxide detector dots aren't useful at low levels. It takes a pretty sophisticated gadget to give good readings of CO levels in airplanes, and it's way too big to carry in one's flight case. Testing on the ground is not entirely satisfactory, since airflow can lessen as well as increase CO



levels in the cockpit, depending on the problem and on the type of plane.

Then again, someone may find out that this wheel has already been invented. There may be some small, highly sophisticated gadget that costs almost no money, which any

pilot could afford. Somehow, though, I think that if such existed it would be for sale in Sporty's catalog.

The ideal situation would be to set up a testing program available to pilots anytime. Buy the same smart analyzer borrowed for this test, set it up at



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See KISS, Page 17

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• K.I.S.S. - 'clear danger'

Continued from Page 16
Humana (close to Merrill) and for a reasonable fee test anyone who's just been flying and would like to check her/his COHb level.

But before getting carried away with that, more study is needed. I know - in Alaska we seem to study things to death. But this isn't the fourteenth rehash of whether we need the Susitna Dam. From Dr. Middaugh's initial test, it appears that there is a clear and present danger. However, with a statistical sample as small as 55 airplanes, one can extrapolate only so far. It would be reasonable to run the same type of test again, with a few tighter controls, possibly in several locations around the state.

The FAA has been very cooperative all along, in supplying information to Dr. Middaugh from their accident records. In a meeting March 29, the FAA, in the persons of Frank Cunningham, Jack Hepler, MD, Paul Stuecke, and others, was briefed on the report. The initial reaction was that they appreciated the briefing and encouraged continuation of the study, according to

Stuecke, the Public Affairs officer.

Copies of the report, by the way, are available from Dr. Middaugh at the Department of Health & Social Services, Division of Public Health, Epidemiology Office, 3601 C Street, Suite 540, Pouch 6333, Anchorage AK 99562, 561-4406.

I hope, if the funding is available from the legislature, that pilots will be willing to go along with further testing. This study showed us a lot, but there is a lot more to be learned. One so-far-untapped source of information is from pilots who have had problems with carbon monoxide and have lived to tell about it.

Have you ever been affected by carbon monoxide in an airplane? Will you tell us about it?

I've agreed to help Dr. Middaugh gather this information. What we need to know is in the questionnaire on this page. You can help by cutting it out and returning it to me, with as many extra sheets as you need to tell your story. Just one request - if your handwriting is anything like mine (unreadable even to me) please print if you don't type. If you think

there's anything on the coupon you don't want to answer, for whatever reason, just print NOYB (none of your business) rather than leaving the space blank. If you want to print NOYB in the space for your name and address, do so, but we'd really prefer to be able to get back to you later for more information. We do promise that any identifying information is strictly confidential.

Thanks for your help. We'll keep you posted.

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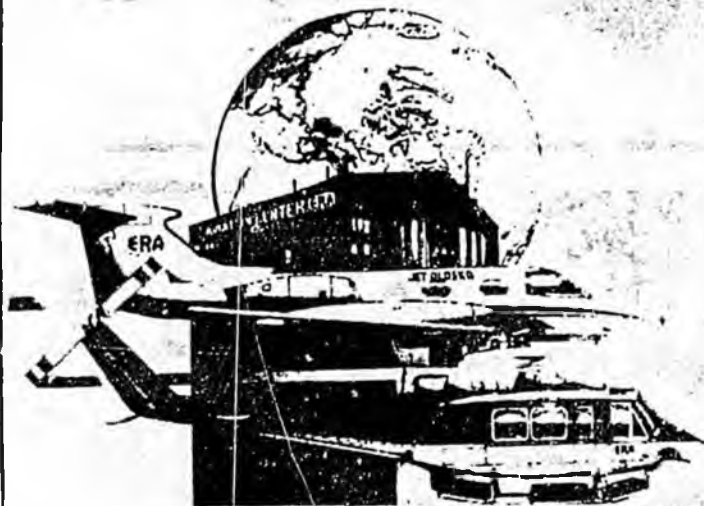
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Study detects potential poisoning

Kent Lee Woodman is the Executive Vice President of the Alaska Airmen's Association and the Vice Chairman and Commissioner on the Municipal Airports Aviation Advisory Commission. He has been a Contributing Editor each issue of Air Alaska since its inception 18 months ago. He is available at Box 2386 SRA, Anchorage 99516, or 345-1356 prior to 9 p.m.

Potential Pilot Poisoning Discovered

One of my favorite "old philosopher" sayings is one attributed to the ancient Chinese: "CRISIS is dangerous opportunity."

If that be true, then an extremely dangerous opportunity surfaced at Merrill Field and in Humana Hospital's lab three weeks ago. Preliminary results of a special sampling of pilots' and passengers' blood revealed possible data which may ultimately lead to a positive correction program to save lives and aircraft!

It all started when the State's Department of Health & Social Services Epidemiologist, Dr. John Middaugh began to study the effects of carbon monoxide on humans operating motor vehicles. Contrary to popular conception, an "epidemic" is not always bubonic plague or a new strain of flu.

As a matter of fact, if half the carpenters in the state began to smash their thumbs with hammers, we have an epidemic of sorts, the causes of which could be studied and diagnosed by an epidemiologist.

Dr. Middaugh's staff was studying the carboxyhemoglobin (the level of carbon monoxide in the blood) levels in the blood of people who were operating automobiles and trucks in Anchorage. He noted that very little such study had been done anywhere.

During the preliminary data investigation, the staff had identified several fatal crashes that were documented as

COMMENTS

by:
Kent
Lee
Woodman

CONTRIBUTING
EDITOR

caused by carbon monoxide poisoning.

Dr. Middaugh began to wonder what the effect of lower levels of carbon monoxide in the blood of pilots might be. Traditionally, the blood of pilots and passengers is not tested for LOW LEVELS of CO unless there is reason to suspect it is a contributing factor in an accident ... and then it's generally a popular conception that it's the lethal levels that do the job.

He hypothesized a pilot could develop the first levels of "poisoning" driving to the aircraft in Anchorage's atmosphere. If he or she smoked, the level is higher. Then into the aircraft and up to altitude where the effects are more pronounced.

Enter a small leak in the heater system, or a manifold or a cylinder head leak with vapors coming through the firewall, and you may have the stage set for a level of CO poisoning which could blur vision, delay critical decisions, fum-

ble critical maneuvers ... even trigger a heart attack where it would not normally be anticipated.

Result: "PILOT ERROR." Because CO poisoning did not, in itself kill or render the pilot unconscious, it may have never been tested for/recognized.

Not a pilot himself, Dr. Middaugh enlisted the aid of the experts — first the Alaska 99s,

See COMMENTS, Page 19

that famous international women's flying organization, then the Alaska Airmen's Association, the largest organization of its type in Alaska.

He asked how to obtain samples; how to enlist the aid and support of the pilots, and we jointly put together a program which tested 96 pilots and passengers on 55 aircraft in a single weekend.

Ten days later the results began to come in and be analyzed. To our wondering horror, the levels we found **PRECISELY SUPPORTED THE ADMITTEDLY WEAK HYPOTHESIS WHICH STARTED THE PROGRAM!**

In fact, eight aircraft had problems sufficient for immediate person-to-person notification of the pilots! One pilot was scheduled for a flight to Nome the next day, and his notice led to the discovery and repair of a manifold leak, and is considered a positive "SAVE" by the group!

By itself it *proves* nothing, but it hints at a real breakthrough. Leaky heaters can be repaired. CO poisoning can be tested for and the culprits can be dealt with ... we could save a bunch of people with a relatively simple, relatively inexpensive program.

Dangerous opportunity: Dr. Middaugh's office has not the funds to complete this testing. He does not have the funds to hire a physician epidemiologist to fill an *existing* vacancy, nor to purchase the special machine he borrowed from the states for last month's exercise, nor to publish his findings, conduct additional tests etc, etc.

In short, we've pried open a secret box, gotten a glimpse of something awesome and have had it snap shut again without a prybar! What to do? Get him some money and let's finish discovering what we can discover about this highly important finding.

When briefed on the results and potential of the program, both the 99s and Airmen held emergency meetings and developed resolutions and press releases. The Airmen are sending a representative to Juneau with a draft bill to appropriate \$275,000 to the State Epidemiologist's office for precise application to the completion of this study. (Subject to locating a total of about \$600 to fly the delegate down and back.)

It's serious, exciting business. When one thinks of the money and effort spent each year conducting safety seminars and accident investigations, let alone the losses to life, happiness and aircraft hulls, \$275,000 as the lead-in to a prevention program stuns the senses for the bargain it is.

To think, all this time we may have had "pilot error" accidents repeating, that were contributed to by a critical delay in a decision, a movement or action stemming from lower level pilot's blood CO poisoning.

We're talking about levels below the threshold of the little audible signal devices you can install in an aircraft; below the levels tested for by the little "blue dots" stuck to panels.

In short, no one even knows that they were poisoned or that these negative factions were bidding for their body's and mind's control.

Certainly the eight folks contacted from our study had no idea. Certainly my wife, who was in one of the aircraft, had no idea.

We need to look into that box. We need a \$275,000 prybar, and then we need the groups which have done so much to date to seek additional protection for the flying public, to keep up the good work and get the results and a correction program out ASAP!

UPDATE: Since the above column was written last week, I have journeyed to Juneau as a representative of the Alaska Airmen's Association and the 99s, and to a lesser extent the Alaskan Aviation Safety Foundation, to attempt to have a bill introduced in both houses to fund the \$275,000 required to complete the testing.

I visited with many senators and representatives and with several departments which will have input, including the Governor's Office, to assure that the measure will not be vetoed on its merits.

I was very encouraged. First, I was impressed with the num-

ber of legislators who had already heard of the program on the radio or through press items I had generated the week prior to my departure. Second, I was impressed with how quickly many of the Legislators came to grips with my explanation, and identified with the program.

I spent two very full days talking about the study, giving out copies of Dr. Midgaugh's report, the proposed bill and it's budget. Half way through the second day, two breakthroughs came which changed the approach somewhat.

Just prior to the breakthrough I had 10 Representatives and eight Senators ready to co-sponsor the measure in their respective houses. When I visited Rep. Niilo Koponen, (D-Fairbanks), he immediately understood the implications and took the bill to be drafted as a committee bill from his House of Health, Education and Social

Services (HESS) Committee.

This at once resolved a difficulty I had previously planning to have Rep. Steve Rieger (R-Anchorage), prime sponsor of the bill. The difficulty was simply that Steve is in the minority in the House, though his being on the Finance Committee and being a pilot made him an obvious choice.

On the Senate side, Sen. Rick Halford was the key. Rick is a well known pilot and general aviation operator and he sits on the Senate Finance Committee. Not only is he involved in civil aviation, but in his background as a multi-engine flight engineer in the Air Guard, he has been to all the aviation physiology courses that the USAF offers.

He determined to include the small item as a line item in the Senate budget.

Now I no longer needed a separate Senate bill, but I elect-

ed to keep the House bill running to keep a focus and to be certain that if it fell out of the budget, that it would be back for reconsideration in the second session without having to start from scratch.

I visited with the Governor's Office, the Department of Health and Social Services and the Department of Labor's office of occupational safety. I also briefed the special assistant to the Insurance Commissioner because of the potential impact on aircraft insurance rates and accidents.

The big stumbling block is the BUDGET. While I was there, both houses were receiving bad news about the price of a barrel of oil on the International market and the adverse affect on the State's budget. They were cutting, cutting, cutting, and there I was with a good plan to spend, spend, spend.

My only response was that this study could save lives, and that if I waited until they called

me and said they had surplus money, I'd die in retirement with no program. Such a study and opportunity comes when it comes, and it is financed when it is financed. Stay tuned; we're not done with this one yet!

• K.I.S.S. - COHb in tests reached dangerous levels

Continued from Page 13
able to measure much lower levels.

To quote from the report:
"... of the 95 individuals we tested, 9 were smokers, 86 were non-smokers. Excluding the smokers, 9 individuals whose carboxyhemoglobin levels exceeded 2.5 percent COHb were identified from 7 different aircraft. (Figure 2)

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See KISS, Page 15

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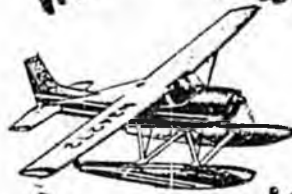
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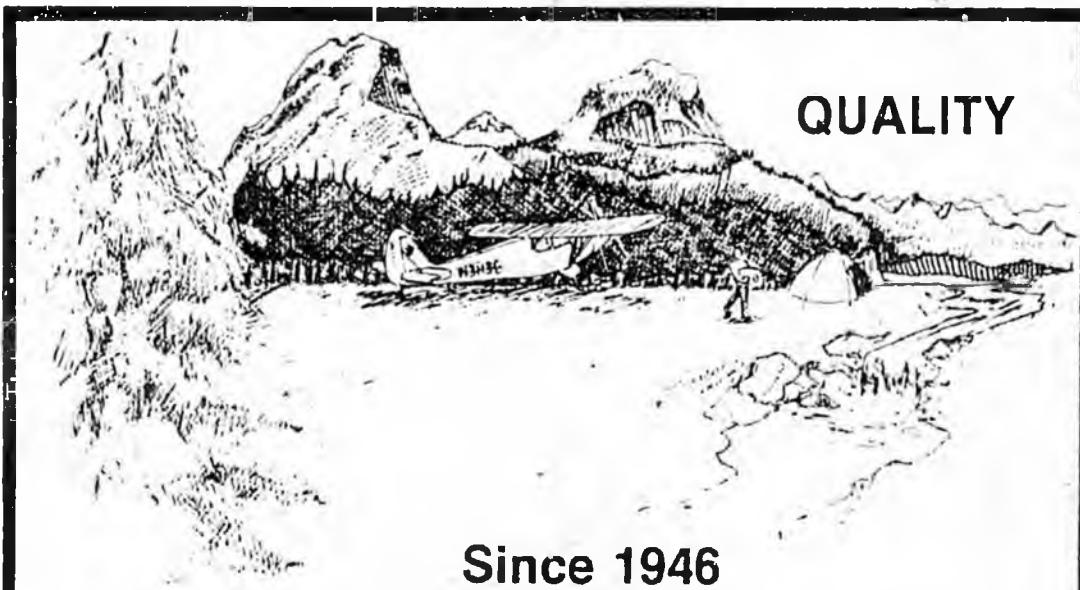


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'Operation Vampire' is a success, CO testing offers help stopping accidents



A K.I.S.S.* FROM THE 99s

By CLAIRE DRENOWATZ

The K.I.S.S. -- "Keep It Safe Service" -- is a regular column appearing in Air Alaska.

The Vampire Report

Well, we asked for it, and we got it - thanks to your help. "Operation Vampire" was a great success - once we moved down to where we could catch you at the fuel pumps! (Thanks to Mike Spornak and Ramona Ardaiz for permission to clutter up their lobbies and bug their customers - we had only a few gripes about having to pay in blood!)

Just in case you've been in Hawaii for the last couple months, I'll explain. Operation Vampire is the name the 99s and the Airmen gave to a project on which we agreed to help out. The State Epidemiologist, Dr. John Middaugh, of the Division of Public Health, had been studying the effects of carbon monoxide in several areas of concern, among them aircraft accidents. He wanted to do an analysis of the blood of a reasonably large sample of pilots who had just flown. Would we help?

So we set it up for the week-

tion," is dated March 21, 1985. A total of 55 aircraft were tested, and 95 pilots and passengers. We got two blood samples from most volunteers, as a control. Another important control, albeit serendipitous, was that we had several aircraft in which only one person is a smoker, though none actually smoked during flight. The non-smokers showed a much lower level of carbon monoxide in their blood than smokers.

It is important that the limitations of the study be noted. For instance, it would have been ideal to have a blood sample of each volunteer before as well as after the flight, to measure the change (if any) precisely. However, there are limits - we probably wouldn't have had any volunteers at all! Dr. Middaugh did get a short questionnaire from each volunteer - how long the flight, smoker/non, etc., for use in working up the statistics.

The equipment used to measure the carbon monoxide lev-

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DURATION OF FLIGHT _____ TYPE ENGINE _____
ALTITUDE OF FLIGHT _____ FUEL HEATER _____
PURPOSE OF FLIGHT _____ WAS ANNUAL CURRENT? _____
CONDITIONS OF FLIGHT - VFR? _____ IFR? _____ AIRFRAME HOURS (AT THE TIME) _____
OTHER (TURBULENCE, ETC) _____ ENGINE HOURS - TOTAL _____ SMOH _____
PILOT AGE _____ YEARS FLYING _____
GOING FROM _____ TO _____ CERTIFICATES HELD _____
PILOT HEALTH _____ TOTAL HOURS _____ IFR HOURS _____
DID YOU SMELL EXHAUST? _____

WHAT WERE YOUR PHYSICAL SYMPTOMS? _____

WHEN DID YOU REALIZE YOUR PROBLEM WAS CARBON MONOXIDE? _____

DID YOU SEE A DOCTOR OR OTHER HEALTH PROFESSIONAL? WHAT WAS HER/HIS REPORT? _____

HOW LONG DID THE EFFECTS LAST ONCE YOU WERE ON THE GROUND? WHAT WERE THEY? _____

WHAT WAS WRONG WITH THE AIRPLANE? _____

NARRATIVE - TELL ME WHAT HAPPENED, ADD ANYTHING WE DIDN'T ASK ABOVE. _____

end of March 2 and 3, planning to use the ACC Aviation Complex ramp for the heavy load of volunteers lured in by all the publicity - and by concern for their safety. The MRI ATIS...minded incoming pilots of the location of the testing site.

However, we really did have to go snag pilots coming in to refuel. Surprisingly, we only had two people - one pilot and one passenger - turn us down cold. No way no needle no how. But the sample was large enough, and after all, this was supposed to be a volunteer project.

The final report, titled "Carbon Monoxide in Pilots and Passengers in General Avia-

tion" (carboxymoglobin levels, actually, or COHb for short) was borrowed from a lower 48 lab, and laboratory testing was done at Humana Hospital. It was interesting to Dr. Mid-daugh that the baseline (the average COHb level of people who had no significant exposure to carbon monoxide - sorta like background radiation) of the study was 1.5 percent or half the generally accepted figure for normal.

Until now, the testing equipment could only say "3 percent or less," since it couldn't accurately measure less - so 3 percent was accepted as normal. Doesn't appear to be, however, with improving technology

See KISS PAGE 14

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• K.I.S.S. on CO levels

Continued from Page 14

that it's cigarette smoke and not the airplane producing the high COHb level?

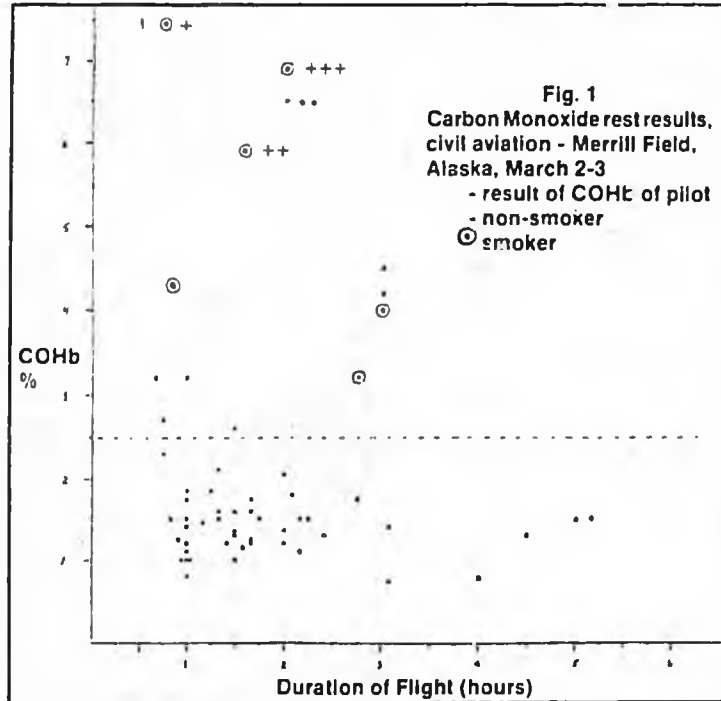
That's where Figure 1 comes in. It includes pilots and passengers. Note that the plot is now COHb level against aircraft. The arrows at the bottom of the graph indicate problem aircraft. The straight vertical lines between dots simply tie together the people in one aircraft. Now it becomes a tad clearer, since several of the smokers were flying with non-smokers, with normal levels.

There's more to it than that, of course, but if you study the graphs you can get the indication of some of the information available in even a small statistical sample.

It was not surprising that elevated COHb levels were found, but that it was found in a high percentage of aircraft tested. 7 out of 55 - 12.7 percent - is a large percentage. (Elsewhere in this issue, look for an article about what the 99s and the Airmen are trying to do about it).

So why is the epidemiologist from the Division of Public Health interested in carbon monoxide in pilots? So why not? (I'm glad someone is!) Epidemiology is more than the study of outbreaks of tuberculosis and hepatitis. The recent study of those ubiquitous killers and maimers, the three-wheelers, was initiated by the same epidemiologist, Dr. John Midgaugh.

Whether from disease or acci-



common cause of impaired circulation, of course, is simply age. Again, how much is too much for whom?

In pilots, altitude's contribu-

tion to the problem is extremely important. Carbon monoxide is such a potent poison because

See KISS, Page 16

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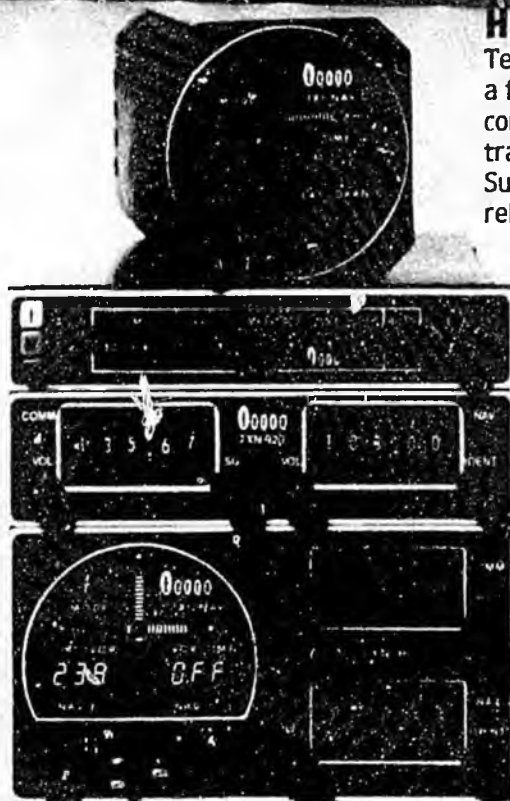
circumstances can rightly be classified as epidemic. Since disease and "accidents" can, in most cases, be prevented, epidemiology looks for the causes, whether a virus or manufacturing defect, and most likely recommends preventive measures. It is for other agencies, whether through prevention or enforcement, to act on the information. First, however, the information must be there.

So far, there hasn't been a lot of work on carbon monoxide as a problem at lower than lethal levels in pilots or motorists. FAA & NTSB statistics shed some light on fatal accidents, but not many pilots get a blood test for COHb level after a ground-loop or a hard landing. What Dr. Middaugh is looking at opens up a whole bagful of questions.

How many "pilot-error" accidents are caused by pilots in whom elevated COHb levels lead to impaired judgment, impaired sensory orientation, impaired coordination?

How much is too much? As noted for years "normal" has been considered to be 3 percent COHb. "Normal" in Dr. Middaugh's study looks like 1.5 percent. If the "normal" is found to be lower than previously recognized, does that also mean that scientists need to revise their thinking about the level at which "impaired" may start?

The effect of carbon monoxide depends on several factors, among them ones physical condition. In a person with a physical problem which impairs circulation, even a very low dose of CO can kill. A pilot with undetected heart disease could die from a 3.0 percent COHb, if the circulation in the heart muscle is sufficiently impaired that small amount of CO triggers a heart attack. A very



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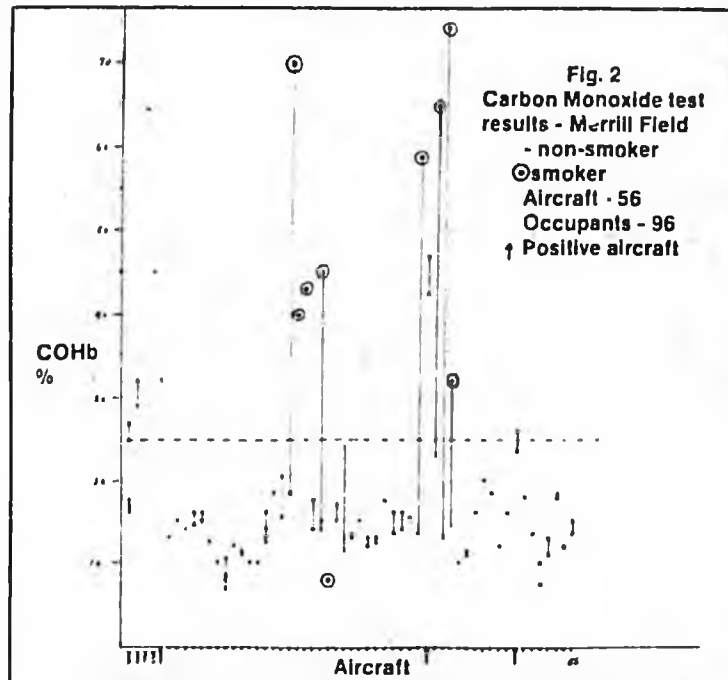
• K.I.S.S. - COHb study results

Continued from Page 15

of the way it works in your body. We all know that we need oxygen to breathe, that our lungs take the oxygen from the air and get it into the bloodstream. The kicker with carbon monoxide is that it is 200 TIMES MORE ABLE to latch onto your hemoglobin (which is the oxygen carrier) than oxygen.

At higher altitudes the amount of oxygen available is less. If CO is present in even small amounts, it has an even easier job of latching on to your hemoglobin. At altitude, what COHb level will impair a pilot's ability? By how much? How much impairment can lead to disaster?

How do we find out for sure where the problems lie? The little carbon monoxide detector dots aren't useful at low levels. It takes a pretty sophisticated gadget to give good readings of CO levels in airplanes, and it's way too big to carry in one's flight case. Testing on the ground is not entirely satisfactory, since airflow can lessen as well as increase CO



levels in the cockpit, depending on the problem and on the type of plane.

Then again, someone may find out that this wheel has already been invented. There may be some small, highly sophisticated gadget that costs almost no money, which any

pilot could afford. Somehow, though, I think that if such existed it would be for sale in Sporty's catalog.

The ideal situation would be to set up a testing program available to pilots anytime. Buy the same smart analyzer borrowed for this test, set it up at

See KISS, Page 17



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• K.I.S.S. - 'clear danger'

Continued from Page 16 Humana (close to Merrill) and for a reasonable fee test anyone who's just been flying and would like to check her/his COHb level.

But before getting carried away with that, more study is needed. I know - in Alaska we seem to study things to death. But this isn't the fourteenth rehash of whether we need the Susitna J... From Dr. Middaugh's initial test, it appears that there is a clear and present danger. However, with a statistical sample as small as 55 airplanes, one can extrapolate only so far. It would be reasonable to run the same type of test again, with a few tighter controls, possibly in several locations around the state.

The FAA has been very cooperative all along, in supplying information to Dr. Middaugh from their accident records. In a meeting March 29, the FAA, in the persons of Frank Cunningham Jack Hepler, MD, Paul Stuecke, and others, was briefed on the report. The initial reaction was that they appreciated the briefing and encouraged continuation of the study, according to

Stuecke, the Public Affairs officer.

Copies of the report, by the way, are available from Dr. Middaugh at the Department of Health & Social Services, Division of Public Health, Epidemiology Office, 3601 C Street, Suite 540, Pouch 6333, Anchorage AK 99502, 561-4406.

I hope, if the funding is available from the legislature, that pilots will be willing to go along with further testing. This study showed us a lot, but there is a lot more to be learned. One so-far-untapped source of information is from pilots who have had problems with carbon monoxide and have lived to tell about it.

Have you ever been affected by carbon monoxide in an airplane? Will you tell us about it?

I've agreed to help Dr. Middaugh gather this information. What we need to know is in the questionnaire on this page. You can help by cutting it out and returning it to me, with as many extra sheets as you need to tell your story. Just one request - if your handwriting is anything like mine (unreadable even to me) please print if you don't type. If you think

there's anything on the coupon you don't want to answer, for whatever reason, just print NOYB (none of your business) rather than leaving the space blank. If you want to print NOYB in the space for your name and address, do so, but we'd really prefer to be able to get back to you later for more information. We do promise that any identifying information is strictly confidential.

Thanks for your help. We'll keep you posted.

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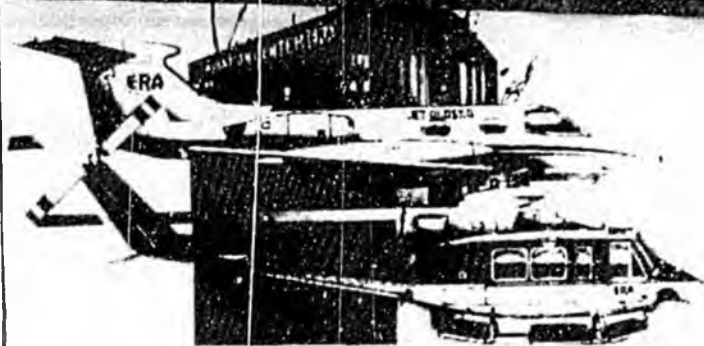
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Study detects potential poisoning

Kent Lee Woodman is the Executive Vice President of the Alaska Airmen's Association and the Vice Chairman and Commissioner on the Municipal Airports Aviation Advisory Commission. He has been a Contributing Editor each issue of Air Alaska since its inception 18 months ago. He is available at Box 2386 SRA, Anchorage 99516, or 345-1356 prior to 9 p.m.

Potential Pilot Poisoning Discovered

One of my favorite "old philosopher" sayings is one attributed to the ancient Chinese: "CRISIS is dangerous opportunity."

If that be true, then an extremely dangerous opportunity surfaced at Merrill Field and in Humana Hospital's lab three weeks ago. Preliminary results of a special sampling of pilots' and passengers' blood revealed possible data which may ultimately lead to a positive correction program to save lives and aircraft!


It all started when the State's Department of Health & Social Services Epidemiologist, Dr. John Middaugh began to study the effects of carbon monoxide on humans operating motor vehicles. Contrary to popular conception, an "epidemic" is not always bubonic plague or a new strain of flu.

As a matter of fact, if half the carpenters in the state began to smash their thumbs with hammers, we have an epidemic of sorts, the causes of which could be studied and diagnosed by an epidemiologist.

Dr. Middaugh's staff was

COMMENTS

by:
kent
lee
woodman



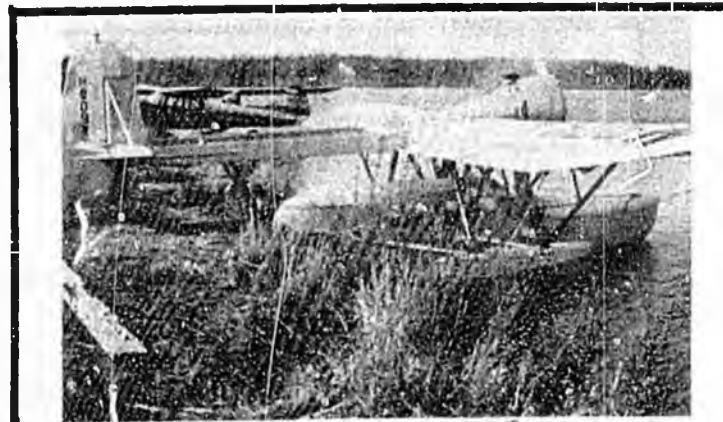
CONTRIBUTING
EDITOR

caused by carbon monoxide poisoning.

Dr. Middaugh began to wonder what the effect of lower levels of carbon monoxide in the blood of pilots might be. Traditionally, the blood of pilots and passengers is not tested for LOW LEVELS of

CO unless there is reason to suspect it is a contributing factor in an accident ... and then it's generally a popular conception that it's the lethal levels that do the job.

He hypothesized a pilot could develop the first levels of "poisoning" driving to the aircraft



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in Anchorage's atmosphere. If he or she smoked, the level is higher. Then into the aircraft and up to altitude where the effects are more pronounced.

Enter a small leak in the heater system, or a manifold or a cylinder head leak with vapors coming through the firewall, and you may have the stage set for a level of CO poisoning which could blur vision, delay critical decisions, tum-

ble critical maneuvers ... even trigger a heart attack where it would not normally be anticipated.

Result: "PILOT ERROR." Because CO poisoning did not, in itself kill or render the pilot unconscious, it may have never been detected or recognized.

Not a pilot himself, Dr. Middaugh enlisted the aid of the experts — first the Alaska 99516. See COMMENTARY

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studying the carboxyhemoglobin (the level of carbon monoxide in the blood) levels in the blood of people who were operating automobiles and trucks in A. storage. He noted that very little such study had been done anywhere.

During the preliminary data investigation, the staff had identified several fatal crashes that were documented as

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• Kent's Comments

Continued from Page 18

that famous international women's flying organization, then the Alaska Airmen's Association, the largest organization of its type in Alaska.

He asked how to obtain samples; how to enlist the aid and support of the pilots, and we jointly put together a program which tested 96 pilots and passengers on 55 aircraft in a single weekend.

Ten days later the results began to come in and be analyzed. To our wondering horror, the levels we found PRECISELY SUPPORTED THE ADMITTEDLY WEAK HYPOTHESIS WHICH STARTED THE PROGRAM!

In fact, eight aircraft had problems sufficient for immediate person-to-person notification of the pilots! One pilot was scheduled for a flight to Nome the next day, and his notice lead to the discovery and repair of a manifold leak, and is considered a positive "SAVE" by the group!

By itself it *proves* nothing, but it hints at a real breakthrough. Leaky heaters can be repaired. CO poisoning can be tested for and the culprits can be dealt with ... we could save a bunch of people with a relatively simple, relatively inexpensive program.

Dangerous opportunity: Dr. Middaugh's office has not the funds to complete this testing. He does not have the funds to hire a physician epidemiologist to fill an *existing* vacancy, nor to purchase the special machine he borrowed from the states for last month's exercise

was in one of the aircraft, had no idea.

We need to look into that box. We need a \$275,000 prybar, and then we need the groups which have done so much to date to seek additional protection for the flying public, to keep up the good work and get the results and a correction program out ASAP!

UPDATE: Since the above column was written last week, I have journeyed to Juneau as a representative of the Alaska Airmen's Association and the 99s, and to a lesser extent the Alaskan Aviation Safety Foundation, to attempt to have a bill introduced in both houses to fund the \$275,000 required to complete the testing.

I visited with many senators and representatives and with several departments which will have input, including the Governor's Office, to assure that the measure will not be vetoed on its merits.

I was very encouraged. First, I was impressed with the num-

ber of legislators who had already heard of the program on the radio or through press items I had generated the week prior to my departure. Second, I was impressed with how quickly many of the Legislators came to grips with my explanation, and identified with the program.

I spent two very full days talking about the study, giving out copies of Dr. Middaugh's report, the proposed bill and it's budget. Half way through the second day, two breakthroughs came which changed the approach somewhat.

Just prior to the breakthrough I had 10 Representatives and eight Senators ready to cosponsor the measure in their respective houses. When I visited Rep. Niilo Koponen, (D-Fairbanks), he immediately understood the implications and took the bill to be drafted as a committee bill from his House of Health, Education and Social

See COMMENTS, Page 20

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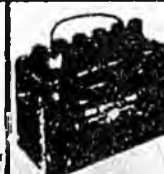
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to publish his findings, conduct additional tests etc, etc.

In short, we've pried open a secret box, gotten a glimpse of something awesome and have had it snap shut again without a prybar! What to do? Get him some money and let's finish discovering what we can discover about this highly important finding.

When briefed on the results and potential of the program, both the 99s and Airmen held emergency meetings and developed resolutions and press releases. The Airmen are sending a representative to Juneau with a draft bill to appropriate \$275,000 to the State Epidemiologist's office for precise application to the completion of this study. (Subject to locating a total of about \$600 to fly the delegate down and back.)

It's serious, exciting business. When one thinks of the money and effort spent each year conducting safety seminars and accident investigations, let alone the losses to life, happiness and aircraft hulls, \$275,000 as the lead-in to a prevention program stuns the senses for the bargain it is.

To think, all this time we may have had "pilot error" accidents repeating, that were contributed to by a critical delay in a decision, a movement or action stemming from lower level pilot's blood CO poisoning.

We're talking about levels below the threshold of the little audible signal devices you can install in an aircraft; below the levels tested for by the little "blue dots" stuck to panels.

In short, no one even knows that they were poisoned or that these negative factions were bidding for their body's and mind's control.

Certainly the eight folks contacted from our study had no idea. Certainly my wife, who

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CESSNA	199-46	120, 140, 170, 172, 175, 180, 182 (6 00-6 tires)	605.00	379.95
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CESSNA	199-62	180, 185, 206 (8 00-6 tires)	712.94	449.80
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Port-A-Port certificates are issued

By KENT LEE WOODMAN

There were times that it seemed it would never happen, and the principals certainly know now what a general contractor does to earn his keep, but certificates of occupancy have been issued, the sublease has been approved and the Mobile Aircraft Shelters at Merrill Field went on the market officially last month, and an open house was also held.

On these pages the past 5 months, details of excavation, utilities, fabrication and other history unfolded, together with photos of the various stages of development of the 28-unit complex.

There were engineering and design changes to make to facilitate an insulated unit and provide the 40 pound snow loading, unique excavation and installation challenges relating to putting power and phone lines to each unit, and there were some delays associated with the unseasonable quantities of freezing rain.

Through it all, however, the

now familiar profiles fell into place and it began to look like the development that the principals had envisioned initially. Because of some factory technicalities, the facility at Merrill currently houses 19 of the 28, with the last nine units scheduled for early spring completion.

The sublease is required because it's Municipal property. The certificate of occupancy is required from the Municipality because they treat the units as "buildings" for their book-keeping records, (though they are equipment for tax purposes). Factory certificates of origin complete the package and a new owner or renter has the required documents to approach his or her lender.

Home Savings & Loan has agreed to make financing available for the structures, and is thoroughly familiar with the development.

Kim Lilly, owner and founder of Port-A-Port in California, visited Anchorage for the first time, to view the completed units and kick off the market-

ing phase.

The units are insulated to allow heating with portable heaters (when incidental maintenance is required) in order to prevent sweating of the solid steel building. An arctic lighting package comes standard and there are several options including a winch for the heavy singles and twins, an alarm package and a special device which allows one to call the hangar and turn on the aircraft electric engine heaters prior to flight.

There are units available currently, both for sale and for long and short term lease. The development has an almost "condo" flavor to it, with monthly fee covering liability insurance, external maintenance, snow removal and the actual tie-down fee itself. Published rules bound to the sublease assure investors that the area will remain the clean, safe, quality development it is today.

Why would a pilot want a Port-A-Port? Here are some of the reasons that have surfaced to date:

- Secure area with no theft of avionics, gas, survival gear, ELT, etc.
- Clean area with no mud, no dirt, no grit; so the finish stays clean and bright, plexiglass lasts longer.
- Safe from winds up to 100 mph.

- Safe pre-heat capability with electricity in each unit.
- No snow removal from the aircraft; no snow removal from the tie-down spot or taxiway in front and no wing covers frozen to the paint.

See PORT PAGE 23

• Kent's Comments

Continued from Page 19

Services (HESS) Committee.

This at once resolved a difficulty I had previously planning to have Rep. Steve Rieger (R-Anchorage), prime sponsor of the bill. The difficulty was simply that Steve is in the minority in the House, though his being on the Finance Com-

ed to keep the House bill running to keep a focus and to be certain that if it fell out of the budget, that it would be back for reconsideration in the second session without having to start from scratch.

I visited with the Governor's Office, the Department of Health and Social Services and the Department of Labor's office of occupational safety. I

me and said they had surplus money, I'd die in retirement with no program. Such a study and opportunity comes when it comes, and it is financed when it is financed. Stay tuned; we're not done with this one yet!

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mittee and being a pilot made him an obvious choice.

On the Senate side, Sen. Rick Halford was the key. Rick is a well known pilot and general aviation operator and he sits on the Senate Finance Committee. Not only is he involved in civil aviation, but in his background as a multi-engine flight engineer in the Air Guard, he has been to all the aviation physiology courses that the USAF offers.

He determined to include the small item as a line item in the Senate budget.

Now I no longer needed a separate Senate bill, but I elect-

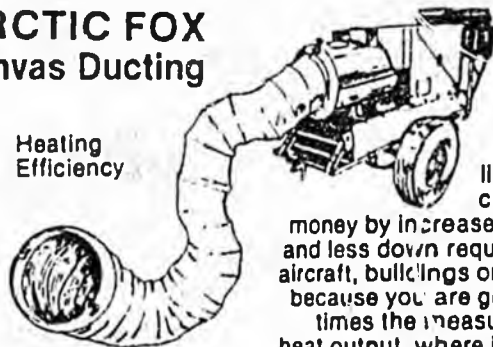
also briefed the special assistant to the Insurance Commissioner because of the potential impact on aircraft insurance rates and accidents.

The big stumbling block is the BUDGET. While I was there, both houses were receiving bad news about the price of a barrel of oil on the International market and the adverse affect on the State's budget. They were cutting, cutting, cutting, and there I was with a good plan to spend, spend, spend.

My only response was that this study could save lives, and that if I waited until they called

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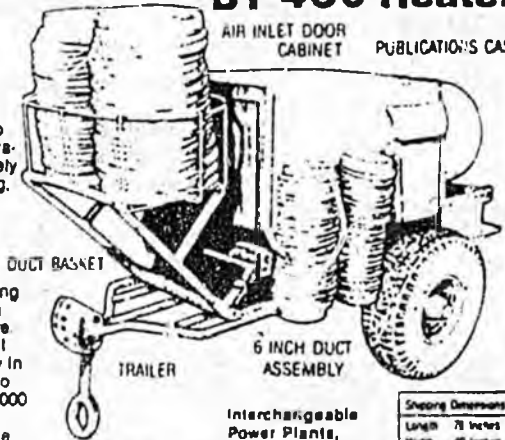


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Please send TELEX to Max Gruenberg and Niilo Koponen,
co-chairmen of House Hess Committee

WHEREAS, the population of Alaska has almost doubled since 1975,
while the State has employed only one medical epidemiologist,
and

WHEREAS, serious and pressing problems that require urgent
medical epidemiologic investigation face Alaskan's today, such
as carbon monoxide among pilots and passengers in general
aviation, carbon monoxide among motor vehicle operators in
Anchorage and Fairbanks, serious pollution of creeks and streams
in Anchorage, high rates of injuries from 3-wheeler all-terrain
vehicles, and high rates of morbidity and fatalities from
voluntary and involuntary injuries, particularly related to
suicide, traffic accidents, and aircraft accidents;

RESOLVE, that the Alaska State Medical Association supports
efforts to fill urgently a second state medical epidemiologist
position in the Epidemiology Office, Division of Public Health.

Send carbon copies to all other members of Senate and House.

Position from:

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Alaska State Medical Association
4107 Laurel Street
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Phone (907) 562-2662



ACC Aviation Complex
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(907) 272-1251

Carbon Monoxide Poisoning of Pilots!

Thank you very much for the opportunity to chat with you and/or your staff to discuss the recently discovered problem of Carbon Monoxide poisoning in aircraft several weeks ago.

When I came to Juneau, it was my intent to have duplicate Senate and House bills introduced, to fund the State epidemiologist for the continuation of the study. Everyone I spoke to was positive on the subject, once they understood it. I was very pleased at how many legislators and staff people took the time to read my material prior to interview, and who developed a sincere concern for the subject after our discussions.

STATUS: As it turned out, my strategy took a somewhat different turn: On the House side, Representative Niilo Koponen immediately recognized the health and public safety ramifications and agreed to have the House HESS Committee introduce the measure as a committee bill. On the Senate side, Senator Rick Halford offered to include the funding as a line item in the Senate budget package.

That would appear to be all that is required. We recognize that funding is limited. Were we to wait for someone in Juneau to call and tell us there is enough money, we'd retire waiting. As urgent requirements are discovered, they need to be introduced, and not put on hold artificially. Then the measures must take their licks in the broad picture. If it is not funded, then we'll all have to look at what was purchased or built and live with the needless death potential in our own ways.

Between our visit and now, some important things have happened: The ALASKA STATE MEDICAL ASSOCIATION has endorsed the program and the funding effort. So has the ANCHORAGE MEDICAL SOCIETY. So has the NTSB chief in Anchorage; JAMES MICHELANGELO has been briefed and is in support. So is the FAA Regional Director FRANK CUNNINGHAM. The USAF Flight Surgeon's office is supportive and has forwarded the report to the Pentagon and to the Air Force Academy. THIS IS EXTREMELY CRITICAL AND THIS IS THE CRITICAL WEEK.

Thank you once again for your concern, interest and time. We especially thank Rep Koponen and Sen Halford for your singular contribution to flying and public safety!

FOR THE PRESIDENT

KENT LEE WOODMAN
Executive Vice President

See reverse for growing list of interested and participating persons:



encl: copy of current issue of AIR ALASKA



Alaska State Representatives

Katie Hurley
Niilo Koponen

Steven Rieger

Max Gruenberg
John Fuller

Drue Pearce

Johne Binkley
Robin Taylor

Alaska State Senators

Mitch Abood
Paul Fischer

Tim Kelly

Edna DeVries
Rick Halford

Arliss Sturgulewski

Bettye Fahrenkamp
Joe Josephson

Other Agencies

Governor's Office: Ms MARSHA A HUBBARD

State Department of Labor: Dr ANNETTE S THORN, Occupational Health

State Department of Health & Social Services: Commissioner JOHN K PUGH

State Insurance Director: Atten: Mr DON KOCH

Alaska Region, FAA: Director FRANKLIN CUNNINGHAM

Alaska Region, NTSB: JAMES MICHELANGELO

Alaska State Medical Association: Ms MARTHA MacDERMAID

Anchorage Medical Society: Ms MARTHA MacDERMAID

FAA Regional Flight Surgeon: Dr JOHN HEPPLER

Center for Disease Control: Atlanta, Georgia

State Epidemiologist: Dr JOHN MIDDAUGH

Alaska Airmen's Association, Inc: President JACK FISHER

Alaska 99s: Chair GINNY HYATT

Alaskan Aviation Safety Foundation: President TOM WARDLIEGH

Alaska Air Carriers Association, Inc: President STEVE WILBUR