

NOTES FOR IAC LUNCH FEB 20TH 2020

THANK YOU, EVELYN, AND THE BOARD OF THE IAC...IT IS A GREAT (AND SOMEWHAT UNEXPECTED) PRIVILEGE TO BE HERE...TODAY, I THOUGHT WE MIGHT TALK ABOUT "AEROSPACE: THE BEST OF TIMES, THE WORST OF TIMES"

I SHOULD STATE UP-FRONT THAT THE VIEWS EXPRESSED TODAY ARE ENTIRELY MY OWN. I AM NO LONGER EMPLOYED BY AIRBUS – AND HAVEN'T BEEN FOR MORE THAN A YEAR. I DO, HOWEVER, SIT AS AN INDEPENDENT DIRECTOR ON THE BOARD OF WIZZ AIRLINES AND FLYHT.

I ALSO WANT TO CREDIT MY FRIEND RICHARD ABOULAFIA FOR HIS DATA – AND RICHARD AND OTHER COLLEAGUES FOR THEIR COUNSEL IN SUPPORT OF TODAY'S COMMENTARY.

"IT WAS THE BEST OF TIMES, IT WAS THE WORST OF TIMES, IT WAS THE AGE OF WISDOM, IT WAS THE AGE OF FOOLISHNESS...IT WAS THE SPRING OF HOPE, IT WAS THE WINTER OF DESPAIR..."

CHARLES DICKENS' OPENING PARAGRAPH OF HIS NOVEL "A TALE OF TWO CITIES", PUBLISHED IN 1859, SPEAKS TO LIFE IN PARIS AT THE TIME OF THE FRENCH REVOLUTION, AND IN LONDON WHICH WAS IN THE MIDST OF THE FIRST INDUSTRIAL REVOLUTION.

TODAY THESE WORDS SEEM PROPHETIC AS WE CONSIDER THE STATE OF THE COMMERCIAL AIRPLANE BUSINESS...AND PERHAPS EVEN BEYOND...

IT IS CLEARLY THE 'BEST OF TIMES' AS WE ARE COMING OFF A 14-YEAR SUPERCYCLE OF GROWTH IN OUR BUSINESS, WHERE WE HAVE SEEN RECORD ORDER BACKLOGS ON THE BACK OF SUSTAINED AIRLINE TRAFFIC GROWTH AND PROFITABILITY, DRIVEN BY LOW INTEREST RATES AND LOW OIL PRICES, AND FUELLED BY A PLENTIFUL

SUPPLY OF CAPITAL...WHILST THE DEFENSE BUSINESS OEM'S HAVE REPORTED 8% TO 12% GROWTH IN 2019.

ALL THIS HAS RESULTED IN A COMBINED BOEING + AIRBUS ORDER BACKLOG OF ALMOST \$850 BILLION...BIGGER THAN THE ANNUAL GDP OF TURKEY!

BUT AT THE VERY SAME TIME, WE SEE GEOPOLITICAL AND TRADE TENSIONS FED BY POLITICAL DIVIDE NOT SEEN SINCE THE COLD WAR; GROWING ENVIRONMENTAL PRESSURES, ESPECIALLY IN EUROPE; THE THREAT OF A PANDEMIC HEALTH SCARE; REGULATORY UNCERTAINTY; INCREASING TAXES AND FEES; AND NOW A SLOWDOWN IN THE ENGINE OF GROWTH THAT IS CHINA...CLOSER TO HOME WE SEE CHRONIC AIRPLANE PROGRAM DELAYS; NOT TO MENTION THE CREEPING COMMODITIZATION OF THE AIRPLANE BUSINESS LEADING TO SEVERE PRICE PRESSURES.

MAYBE "THE WORST OF TIMES" DOES BETTER DESCRIBE OUR CURRENT SITUATION.

IF I MAY, LET ME PROVIDE A BIT OF BACKGROUND ON MY PERSPECTIVE. I GRADUATED IN AERONAUTICAL ENGINEERING IN 1969. THAT WAS CLEARLY THE BEST OF TIMES: THE FIRST FLIGHT OF THE B747 AND THE CONCORDE; APOLLO 11; AND THE BIRTH OF AIRBUS ALL TOOK PLACE THAT YEAR...AND THERE WAS NO LACK OF INSPIRATIONAL PEOPLE LIKE JOE SUTTER AND NEIL ARMSTRONG...

THE CLASS OF 1969 WAS FULL OF AMBITION AND EXCITEMENT...!

IN FACT, THE WHOLE OF MY 50 YEAR CAREER SAW, ON BALANCE, THE BEST OF TIMES AS THE AIRPLANE BROUGHT ABOUT A SECOND INDUSTRIAL REVOLUTION, ONLY THIS TIME ON A GLOBAL SCALE. MANY OF US IN THIS ROOM HAVE BEEN PRIVILEGED TO HAVE OBSERVED -CLOSE UP- ALMOST ONE HALF OF THE LIFE SPAN OF THE ENTIRE AIRPLANE BUSINESS.

AND ALONG THE WAY, I LEARNED SOME SIMPLE LESSONS THAT APPLY TO OUR (OR ANY) BUSINESS...

- 1) GOOD JUDGEMENT COMES FROM EXPERIENCE, AND EXPERIENCE OFTEN COMES FROM BAD JUDGEMENT...PILOTS IN THE ROOM KNOW WHAT I AM TALKING ABOUT...**
- 2) LEARN FROM THE MISTAKES OF OTHERS, YOU WILL NOT LIVE LONG ENOUGH TO MAKE THEM ALL YOURSELF...**
- 3) KEEP THE "FIRE IN YOUR BELLY"...**
- 4) DON'T BELIEVE YOUR OWN PRESS...THAT IS TO SAY, "STAY HUMBLE"**
- 5) THE PHRASE "IT CAN'T BE DONE" IS INSPIRATIONAL TO AN AERONAUTICAL ENGINEER (JUST ASK FRED SMITH, OR FRANK WHITTLE, OR...)**
- 6) TEAMWORK AND LEADERSHIP ALWAYS TRUMP ARROGANCE AND THE USE OF THE WORD "I" OR THE PHRASE "MY PEOPLE..."**
- 7) AIM REALLY HIGH, BELIEVE IN YOURSELF, AND BELIEVE IN OTHERS...**

I ALSO LEARNED THAT AVIATION HAS ALWAYS BEEN ABOUT CHALLENGING "WHAT CAN'T BE DONE" ...AND IN A MUCH BROADER SENSE IT HAS ALWAYS BEEN ABOUT CREATING AND ENABLING "THE BEST OF TIMES".

BUT THIS STUFF IS HARD WORK AND CAN LEAD TO SOME SPECTACULAR FAILURES.

SOME EXAMPLES FROM MY OWN EXPERIENCES; I AM SURE YOU HAVE YOUR OWN:

- **IN 1971, I WAS JUST 18 MONTHS INTO MY OWN CAREER WHEN MY EMPLOYER, ROLLS ROYCE WENT BANKRUPT...BUT NOTE THAT THE COMPANY SURVIVED AND FLOURISHED TO BECOME A WORLD LEADER IN COMMERCIAL JET ENGINES.**
- **I WAS PRESENT IN BURBANK ON 7 DECEMBER 1981 WHEN LOCKHEED SHUT DOWN THE L1011 PROGRAM THUS EXITING THE COMMERCIAL AIRPLANE BUSINESS AFTER 54 GREAT YEARS...BUT THEY GOT THROUGH IT AND TODAY ARE THE WORLD'S LARGEST DEFENCE OEM.**
- **LIKE MANY OF YOU, I MOURNED THE APOLLO 1 DISASTER...BUT JUST 2 1/2 YEARS LATER APOLLO 11 LANDED ON THE MOON, AND CAME BACK...**
- **I WAS LUCKY ENOUGH TO FLY ON CONCORDE MANY TIMES...IT WAS -IN MY MIND- THE HIGH POINT OF AERONAUTICAL TECHNICAL ACHIEVEMENT...AN ENGINEERING MARVEL, AN ARTISTIC STATEMENT, AND A FINANCIAL DISASTER...BUT IT PAVED THE WAY FOR THE AIRBUS PARTNERSHIP.**

MY GRANDMA USED TO SAY "THESE THINGS ARE SENT TO TRY US"...SO WHEN IT SEEMS WE ARE IN "THE WORST OF TIMES", THAT IS REALLY WHEN OUR INDUSTRY RISES TO THE CHALLENGE...AND SHOWS HOW "IT CAN BE DONE" ...

MAYBE WE JUST EXCEL AT CRISIS MANAGEMENT...RECOVERY IS OUR STRONG SUIT...IT'S WHAT WE ALWAYS DO...REALLY WELL!

HOWEVER, RECENTLY I ADMIT I ASK MYSELF "HAS THIS INDUSTRY BECOME JUST TOO LARGE TO MANAGE", AND IS THIS WHY WE SEEM TO BE CONSTANTLY LATE, OVER BUDGET, UNDER-RESOURCED, AND REPEATEDLY A FRONT-PAGE STORY?

AND THIS IS NOT JUST A BOEING MAX STORY...LEST ANYONE FORGET AIRBUS IS PERENNIALY LATE WITH A321NEO DELIVERIES (NOT TO MENTION THE A380 STORY)...PRATT & WHITNEY HAVE EXPERIENCED CHRONIC DESIGN PROBLEMS ON THE GTF (BUT NOT-APPARENTLY- IN THE NEW GEARBOX CONCEPT)...ROLLS ROYCE SEEMS TO HAVE LOST THE PLOT WITH ITS TRENT RELIABILITY ISSUES... BOMBARDIER IS ALMOST OUT OF THE AIRPLANE BUSINESS (WE'LL KNOW MORE TOMORROW)...EMBRAER'S MARKET IS DRYING UP...AND THE ENTIRE WIDE-BODY MARKET IS APPARENTLY OVERSUPPLIED...

....WHILST ON THE MILITARY SIDE THE F35 IS SPECTACULARLY EXPENSIVE, THE A400M WAS SAVED BY ITS CUSTOMERS, AND THE KC46 STILL BEING FIXED

NOW I DO NOT MEAN TO OFFEND, SO APOLOGIES TO THOSE IN THE ROOM WHO ARE INVOLVED IN THESE PROGRAMS... I SIMPLY SUMMARIZE WHAT I READ IN THE PRESS. TO THOSE IN THE ROOM NOT INVOLVED IN ANY OF THIS; STICK AROUND; YOUR TIME WILL COME.

BUT THE REAL ISSUE IS WHY HAS THE INDUSTRY SEEMINGLY LOST ITS MOJO? WHAT IS GOING ON TO BRING ABOUT "THE WORST OF TIMES?"

I BELIEVE THERE ARE A NUMBER OF COMMON THREADS...AND HERE I WOULD ASK YOU TO REMEMBER SOME OF THOSE "LESSONS LEARNED" THAT I TALKED ABOUT EARLIER...

- 1) OUR INDUSTRY SIMPLY DOES NOT HAVE ENOUGH EXPERIENCED ENGINEERS...DESIGNING AND MAKING AIRPLANES, ENGINES AND AVIONICS IS HARD WORK. IT DEMANDS A “DESIGN-MAKE-TEST-BREAK-REPEAT” CYCLE THAT DOESN’T EASILY TRANSFER INTO A COMPUTER MODEL. MANY OF THE GUYS WHO LEARNED ALL THIS THE HARD WAY ARE ON THE GOLF COURSE NOW; AND WE NEVER THOUGHT IT IMPORTANT TO ENSURE THEY PASSED ON THEIR HARD EARNED KNOWLEDGE BEFORE WE LET THEM GO...WE’VE GOT A HUGE TASK TO KEEP -AND RESPECT- THE FOLKS WE STILL HAVE LEFT; TO RECRUIT THE NEXT GENERATION; AND TO PASS DOWN THE TRIBAL KNOWLEDGE BEFORE IT IS LOST FOREVER.**
- 2) AS MANY HAVE POINTED OUT BEFORE, WE NEED TO MAINTAIN AND NURTURE THE STRONG PARTNERSHIP THAT HAS ALWAYS EXISTED BETWEEN THE MARKET, INDUSTRY, ACADEMIA AND GOVERNMENT. THE MARKET PROVIDES THE NEED; INDUSTRY PROVIDES THE VISION AND THE PROGRAMS; ACADEMIA PROVIDES THE EDUCATION, INNOVATION AND NEXT GENERATION OF ENGINEERS AND PROGRAM MANAGERS; AND GOVERNMENT NEEDS TO PROVIDE A STRUCTURE THAT RECOGNIZES THE SOCIAL AND ECONOMIC GROWTH THAT OUR INDUSTRY ENABLES. BY THE WAY, ON THIS LAST POINT, WE SHOULD NOTE THE INDUSTRY'S REGULATORY FRAMEWORK TODAY MEANS CERTIFYING DERIVATIVE AIRPLANES IS ALWAYS MUCH EASIER AND LESS COSTLY THAN CERTIFYING A NEW DESIGN. DO WE REALLY WANT TO ENCOURAGE THE CONTINUATION OF THAT?**

- 3) AN AIRPLANE IS A MILLION PARTS FLYING IN CLOSE FORMATION. SO WE NEED TO GO BACK TO A TRUE PARTNERSHIP CULTURE THROUGHOUT THE SUPPLY CHAIN. AS DEFALATIONARY PRICE PRESSURES HEAPED COST CUTS ON ALL, IT HAS BECOME A “THEM vs US”/“WINNER vs LOSERS” CONFRONTATION BETWEEN THE OEM’S, THE TIER-1, TIER-2 AND -3 SUPPLIERS IN RECENT YEARS, AND NOW WE ARE REAPING WHAT WE HAVE SOWED. THIS COULD BE THE SUBJECT OF A WHOLE OTHER SPEECH BUT SUFFICE TO SAY EVERYONE IN THIS HUGE AND COMPLICATED SUPPLY CHAIN LIVES OR DIES ON THE SUCCESS OF EACH OTHER.
- 4) THE DRAMATIC GROWTH OF THE INDUSTRY (14 YEAR SUPER CYCLE) HAS BEEN GOOD NEWS, YET BAD NEWS. OUR SKY-HIGH BACKLOGS HAVE LED TO SEVERE SUPPLY CHAIN STRESS. AND FOR GUYS IN THE ENGINE, AVIONICS AND CABIN BUSINESS IT IS NOT JUST OEM GROWTH, BUT FEEDING THE GROWING MRO AND RMU (RETROFIT/MODS/UPGRADES) MARKET COMPOUNDS THESE CHALLENGES. THIS IS THE DOWNSIDE OF A SUPERCYCLE; WE HAVEN’T SEEN THE NATURAL “CLEAN-OUT” THAT A DOWNTURN HISTORICALLY BRINGS...IN EFFECT, WE FORGOT HOW TO MANAGE AS IF WE WERE IN A DOWNTURN.
- 5) COMPETITION IS A GREAT TOOL TO DRIVE INNOVATION...BUT PERHAPS THE DOMINANT BOEING/AIRBUS DUOPOLY HAS DULLED THAT INITIATIVE. WE NEED A STRONG BOEING AND A STRONG AIRBUS...AND MAYBE STRONG CHINA (OR AN ELON MUSK) TOO...
- 6) FINALLY, AND MOST IMPORTANT OF ALL, I BELIEVE WE NEED INVESTMENT NOW IN A MAJOR NEW COMMERCIAL AIRPLANE PROGRAM. IT'S WHAT WE DO....

OF COURSE, YOU WILL SAY WE HAVE LOTS OF INVESTMENT (OR AT LEAST TALK OF INVESTMENT) IN AERIAL TAXIS, ELECTRIC AIRPLANES, UNMANNED VEHICLES, SUPERSONICS, SPACE X, BLUE ORIGIN, AND ALTERNATIVE ENERGIES...ALL GREAT STUFF...!

BUT WHAT I AM TALKING ABOUT IS AN AMBITIOUS NEW COMMERCIAL AIRCRAFT PROGRAM...A 'FLAG TO RALLY AROUND'...SOMETHING THAT GETS THE ENGINEERS OUT OF BED IN THE MORNING TO GO TO WORK FEELING PROUD OF THEIR WORK...SOMETHING WHERE EVERYONE GOES THE EXTRA MILE TO CREATE ANOTHER AEROSPACE LEGEND...

10 YEARS AGO AT AIRBUS I WAS STRONGLY IN FAVOUR OF DOING THE A320NEO RATHER THAN A NEW DESIGN. BOEING RESPONDED IN A SIMILAR VEIN WITH THE MAX. NOTE: AT THIS POINT WE SHOULD ALL AGREE THAT FIXING THE MAX IS IN EVERYONE'S, REPEAT EVERYONE'S, BEST INTEREST...BUT TODAY I WOULD ALSO ENCOURAGE BOEING TO QUICKLY AND EMPHATICALLY LAUNCH THE NEXT NEW BOEING AIRPLANE PROGRAM FOR SO MANY REASONS.

AND I WOULD ENCOURAGE AIRBUS TO DO THE SAME, FOR ALL THE SAME REASONS:

HERE'S WHY WE SHOULD DO THIS NOW:

- **THE BACKLOG OF THE CURRENT SINGLE AISLE AIRPLANES PROVIDES A CUSHION TO LAUNCH A NEW PROGRAM WITHOUT CANNIBALISING THE EXISTING ONE...**
- **ENVIRONMENTAL PRESSURES DEMAND WE SET OURSELVES A NEW TARGET OF, SAY, 50% REDUCTION IN EMISSIONS OVER THE PROGRAM'S LIFE...FROM TODAY'S AIRPLANES.**
- **TO DO NOTHING, OR EVEN JUST ANOTHER DERIVATIVE, DOOMS THE INDUSTRY TO LOSING GENERATIONS OF HARD-EARNED EXPERIENCE THAT WE WILL NEVER GET BACK...NOT JUST IN THE OEM'S BUT THROUGHOUT THE SUPPLY CHAIN...**
- **EXCITING TECHNOLOGIES ARE NOW READY OR NEARLY READY TO INCORPORATE IN A NEW PROGRAM...HIGH-VOLUME COMPOSITE MATERIALS; HYBRID AND ELECTRIC PROPULSION; SINGLE PILOT CONTROL PHILOSOPHY; DIGITAL DESIGN AND MANUFACTURE, ALTERNATIVE FUELS AND NEW AIRPLANE CONCEPTS LIKE AIRBUS' MAVERIC...ALL THESE THINGS CAN DRIVE LOWER COSTS, BETTER ENVIRONMENTAL FOOTPRINT AND SIMULTANEOUSLY RENEW THE FAITH OF THE ENGINEERS AND THE NEEDED PARTNERSHIP WITH THE SUPPLY CHAIN.**
- **AND FINALLY IT PROVIDES A CHANCE FOR THE TEAM OF THE FUTURE TO RETURN TO THE BASICS OF THE PAST...TRUST, TEAMWORK, LEADERSHIP, HUMILITY, BELIEF IN YOURSELF AND OTHERS, AND REJOICING IN THE THRILL OF THAT SUCCESSFUL "FIRST FLIGHT" ...**

WE OPENED WITH THE FIRST WORDS OF "A TALE OF TWO CITIES"...THAT SAME PARAGRAPH ENDS "WE HAD NOTHING BEFORE US, WE WERE ALL GOING DIRECTLY TO HEAVEN, WE WERE ALL GOING DIRECTLY THE OTHER WAY"

SO, IS IT THE BEST OF TIMES OR THE WORST OF TIMES...?

IS THE AIRPLANE BUSINESS GOING TO HEAVEN OR “THE OTHER WAY”...?

I AM THE ETERNAL OPTIMIST...LIKE MANY OF MY COLLEAGUES, I WAS PRIVILEGED TO LIVE AND WORK THROUGH THE BEST OF TIMES IN THE AIRPLANE BUSINESS. WE DID IT BY LIVING TO SIMPLE RULES, AND THRIVING ON THE CHALLENGE WHEN PEOPLE SAID “IT CAN’T BE DONE”.

I SEE NO REASON WHY THAT SHOULD CHANGE.

FOR ME, I AM LOVING RETIREMENT...BUT FOR THOSE HERE STILL GAINFULLY EMPLOYED, WHEN PEOPLE (USUALLY FROM OUTSIDE OUR INDUSTRY) TALK ABOUT THE “WORST OF TIMES”, OR SUGGEST “IT CAN’T BE DONE”...I WANT YOU TO REPLY “OH YEAH, WELL JUST LET US SHOW YOU..”!

IN AEROSPACE, THAT’S WHAT WE DO.

THANK YOU INVITING ME, AND ESPECIALLY FOR SITTING QUIETLY AND LISTENING...AND NOW, I HOPE WE HAVE TIME TO HEAR FROM YOU...