

A GREAT IDEA!

AEROWING

Advanced Ground Support



*An Advanced, Worldwide Leader in **Rapid...***

- *Leak Detection*
- *Sealant Removal*
- *Curing Repair*

STANDARD REPAIR TIMES

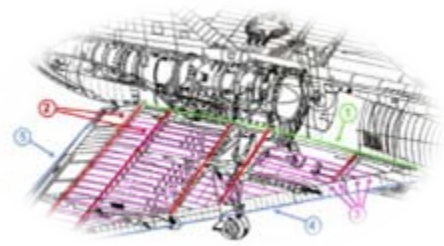
➤ **Engine Change 4 to 6 hours**



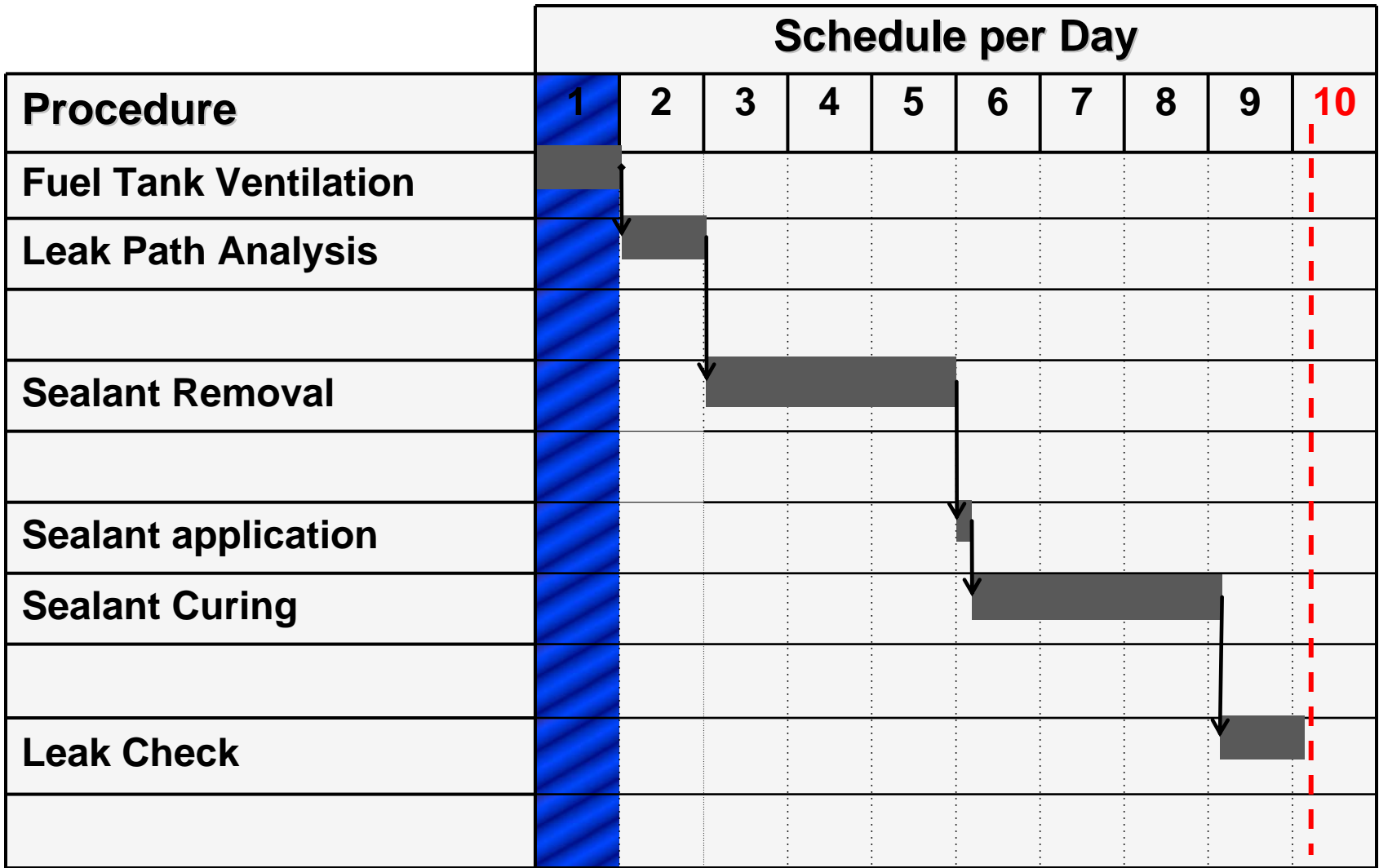
➤ **R & R a component Few minutes to few hours**



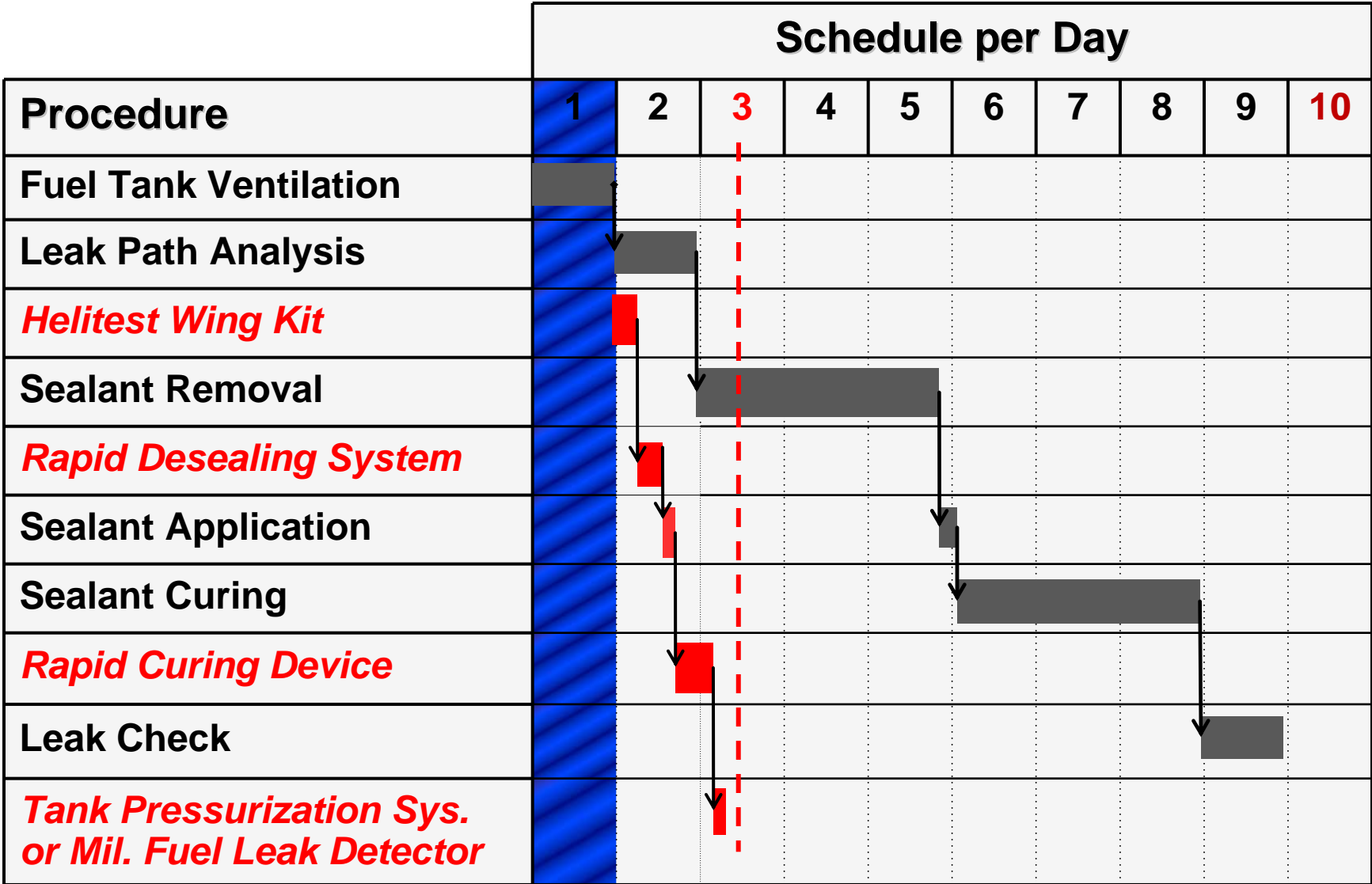
➤ **Fuel Leak. Unknown, several hours to several days! Typical fuel leak can ground an aircraft for days, sometimes weeks!!! Leaks occur anytime, anywhere. All aircraft develop fuel leaks at one time or another; Usually, at the most costly time (urgent military operation, passengers waiting at both ends of the flight). Fuel leaks are one of the most time consuming maintenance tasks required on an aircraft.**



TYPICAL EXAMPLE OF FUEL LEAK REPAIR SCHEDULE



FUEL LEAK REPAIR SCHEDULE *with Aerowing's Technologies*

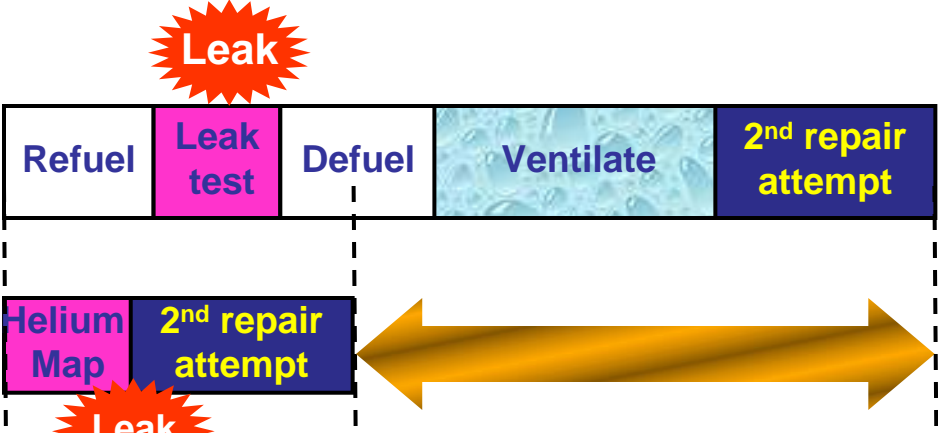


TANK PRESSURIZATION SYSTEM

Extra benefit of Helium Mapping in case of an unsuccessful repair

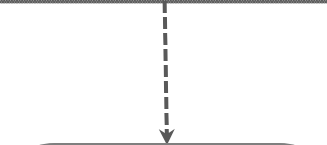
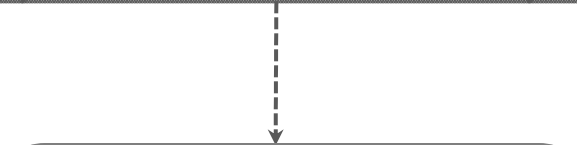
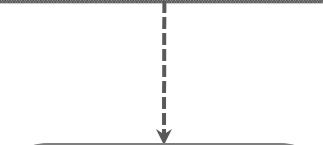
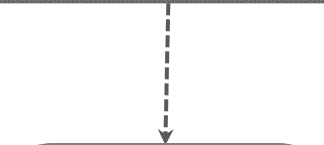
Procedure	Schedule in Day									
	1	2	3	4	5	6	7	8	9	10
Tank Ventilation	[Shaded]									
Leak Path Analysis	[Shaded]									
<i>Helitest Wing Kit</i>	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]
Sealant Removal	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]
<i>Rapid Desealing System</i>	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]
Sealant application	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]
Sealant Curing	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]
<i>Rapid Curing Device</i>	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]
Leak Check	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]	[Shaded]
<i>Tank Pressurization Sys</i>	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]	[Red square]

1st repair attempt



Savings of up to 2 full days of downtime

AEROWING SOLUTION FOR HEAVY AIRCRAFT & FIGHTER JETS





- **In the fleet, standard repair process of a leaking bladder cell takes between 2 to 4 weeks, depending on the damage.**
- **Cost of repair is combined with bladder cell exchange and manhours (more than \$100,000.00).**
- **With the Helium technology, the bladder cell stays onboard and the repair will take no longer than 24 hours.
Again, the kit is amortized with the first aircraft repair.**

C130 Heavy Maintenance



- **Currently, at the end of heavy mx., several roundtrips to the refuel dock may be necessary to fix all fuel leaks that were not found by current maintenance practices (sometimes up to 10 trips).**
- **Each roundtrip costs \$40,000.00.**
- **Leak detection kit cost is amortized after the first airplane. Can help eliminate trips to the refuel dock by testing the integrity of the leak repairs, using helium.**
- **Easy extrapolation can be made for C5, C17, KC10, KC135, B1, B2, etc...**

Military implementation around the world



U.S. AIR FORCE

All DoD services can benefit from the technology presented. There is room for growth and additional implementation across DoD platforms.

Current Utilization

**More than 35 ANG KC-135 locations /
Tinker (KC-135) Heavy Mx. /
Warner Robins (C-5) Heavy Mx. /
Ellsworth (B-1) Squadron Operations**



US NAVY at NAS Jacksonville, FL - F18

**Royal Australian AF
Spanish AF
French AF
Finnish AF
German luftwaffe
Royal Oman AF
Pakistan AF
Kuwait AF**

**Boeing
E.A.D.S
Northrop Grumman
Vought
Embraer
L3
Dassault**

Commercial endorsement of the technology

Already approved and used by major manufacturers

- **Boeing , Airbus, Bombardier, Embraer, Dassault, Cessna, etc...**

Already in use by numerous commercial airlines

- **Europe: Lufthansa, Air France, British Airways, etc....**
- **Asia and Middle-East: Singapore, Air China, etc...**
- **USA: Delta, UAL, US Airways, Horizon, etc...**

Major MRO

- **Lufthansa technics, Ameco, AF industries, TAT, etc...**

General potential R.O.I for DoD

- **Total DoD Aircrafts fleet about 20 000 units**
- **1 Fuel Leak = Average cost about, \$50,000**
- **Assuming that 1 airplane develops an average of 1 leak/year**
- **Cost of leak non conformance = about \$1 billion / year**
- **Aerowing technology could save 70% of this cost
= \$700 million (as estimated by US Pentagon recent study)**

What has been done for transitioning technology to DoD

- **Investment of \$4 million in demonstrations and aircraft repairs for US Air Force over the last 5 years.**
- **Several very positive technical reports from AMC, ACC, ANG, AFRL and other laboratories, have been issued. Next one pending directly issued from Pentagon.**
- **Attending and sponsoring hundreds of dedicated US Military exhibitions and conferences**
- **Create interest at all levels within the US Military by proving technology is beneficial (presentations, demonstrations, LEAN events, etc.).**

However: NOTHING CONSISTENT, FOR IMPLEMENTATION, IS HAPPENING TODAY!

Main factors preventing success

- **Boeing Scandal Syndrome: Everyone, at all levels, recognizes the benefits. However, a good idea with new technology requires a strong sponsor inside the DoD system to champion through DoD, without being afraid of being accused of getting too close to a private company.**
- **Impossible to follow up on the status of open contracts, for the same reason. When this happens, budget diversion is a threat to small companies. It's very easy for Gov't to divert funds, at any time, to another project.**
- **Small company on a niche market. Does not create major interest for lobbyist.**
- **Limited sales force resources due to initial investment limitations. This does not allow us to promote in each USAF base, one by one. Because there has been no one to champion for global approval, each weapon system wants their own « demo » therefore wasting resources.**
- **« Lack of Time » for USAF engineering to introduce new procedures in the T.O.s, even when we help write them.**



THANKS FOR YOUR ATTENTION