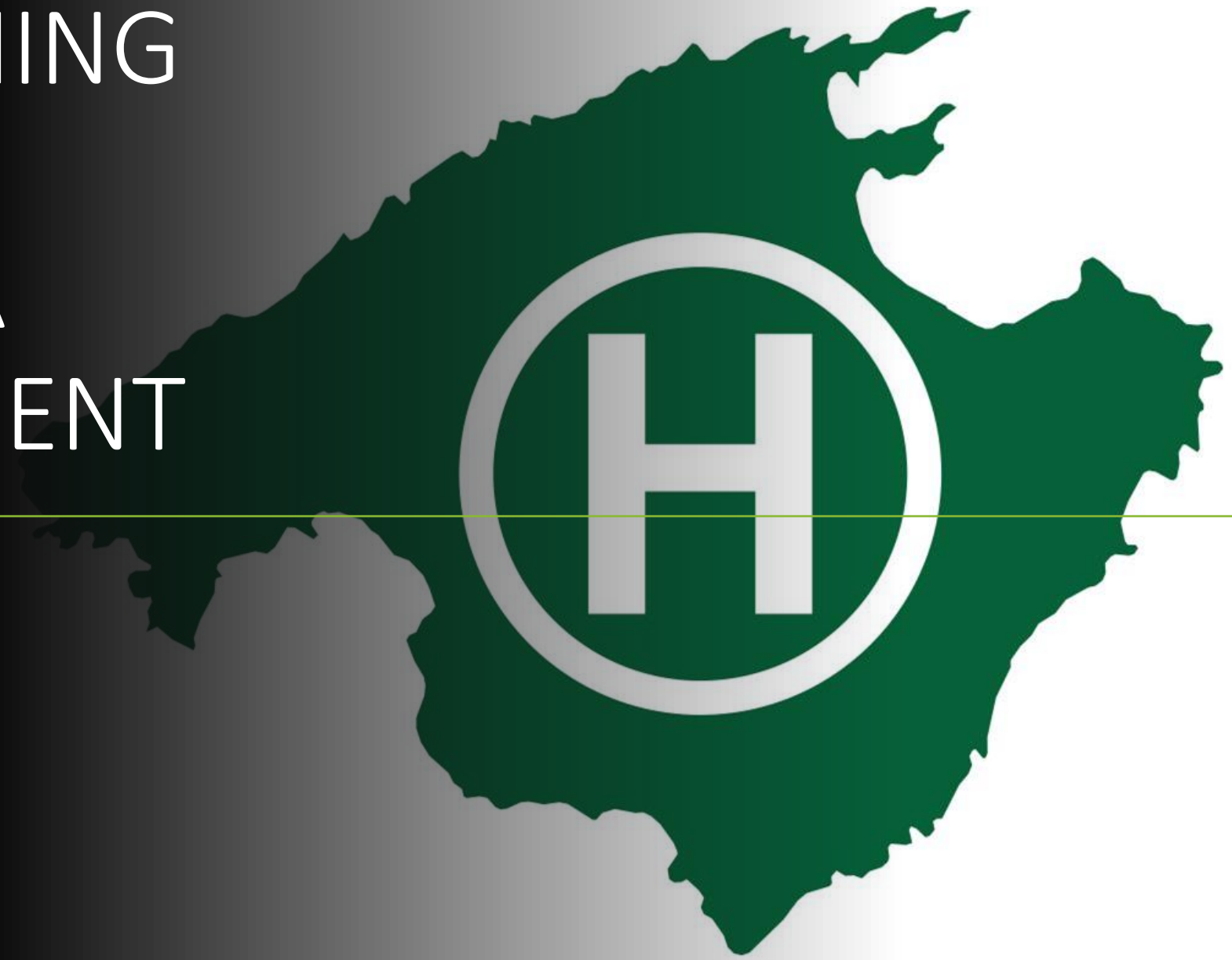
OVERPITCHING & POWER MANAGEMENT



Jonny Greenall
Balearic Helicopters
November 2023

VIDEO 1


THE
Sun

NOTES

- Did you hear the RPM decay?
- How long was the Low RPM Light and Horn on?
- Did you notice the yaw strings?
- No recovery action from the pilot?

VIDEO 2


LIFE NEWS

NOTES

- Did you notice the MAP?
- Did you notice the RPM?

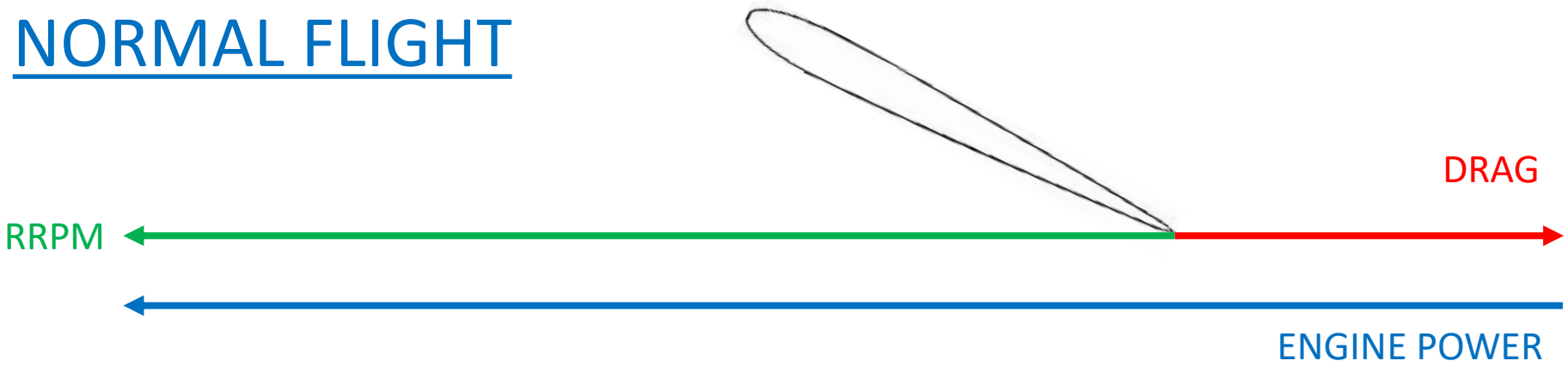

NEWS

RPM BELOW 80%

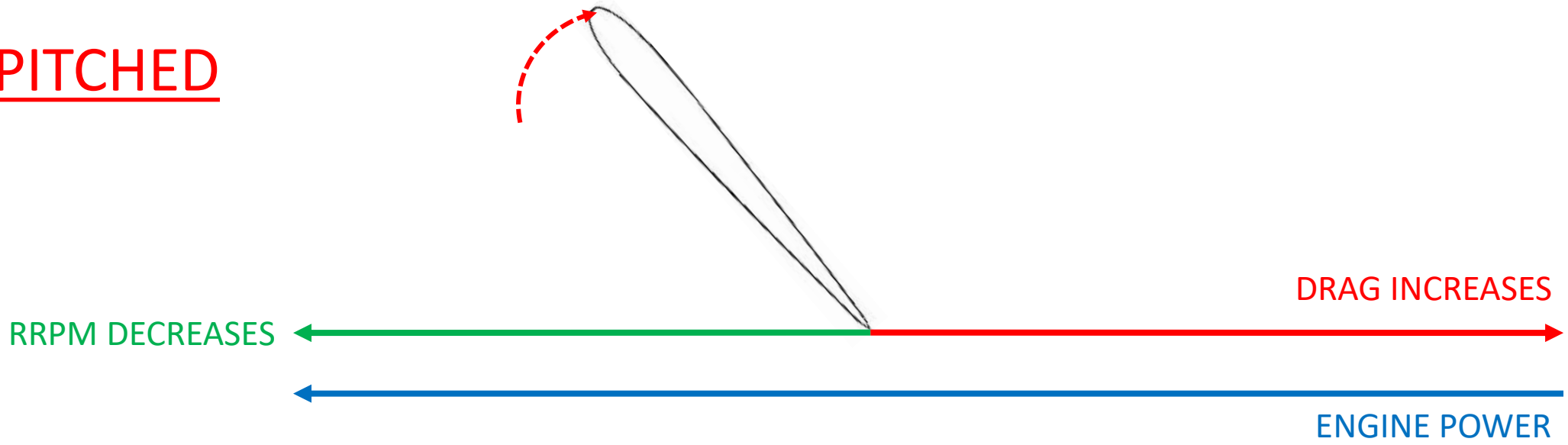
MAP ABOVE 26”

WHAT IS OVERPITCHING ?

NORMAL FLIGHT



OVERPITCHED

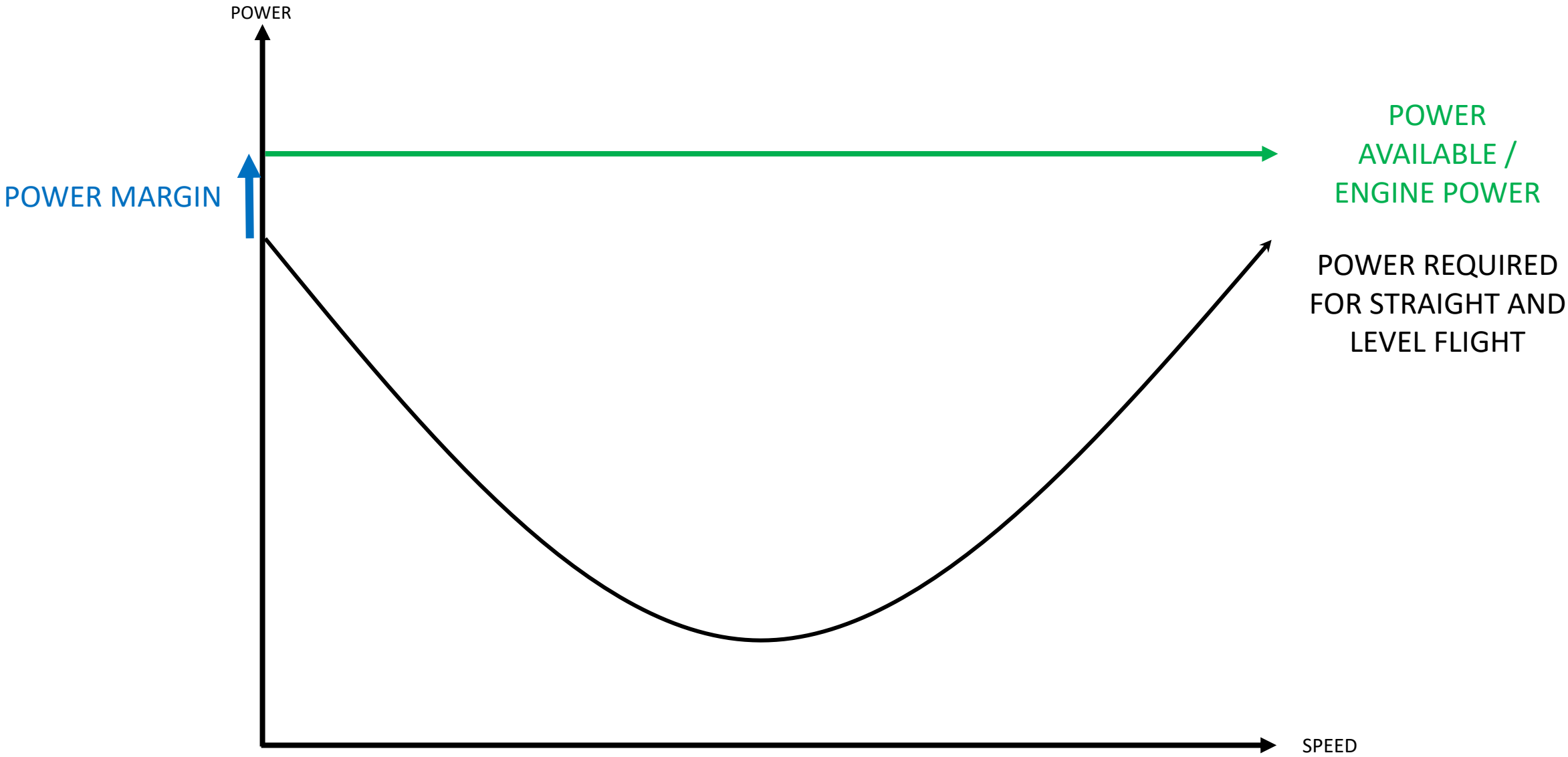


SYMPTOMS

- FULL THROTTLE LIGHT
- RRPM / ERPM DECAY
- YOU CAN HEAR RPM DECAY
- AIRCRAFT VIBRATION
- LOSS OF TAIL ROTOR THRUST (YAW)
- LOW RPM HORN & LIGHT
- AIRCRAFT SINKING / INCREASED RATE OF DESCENT
- ROTOR STALL

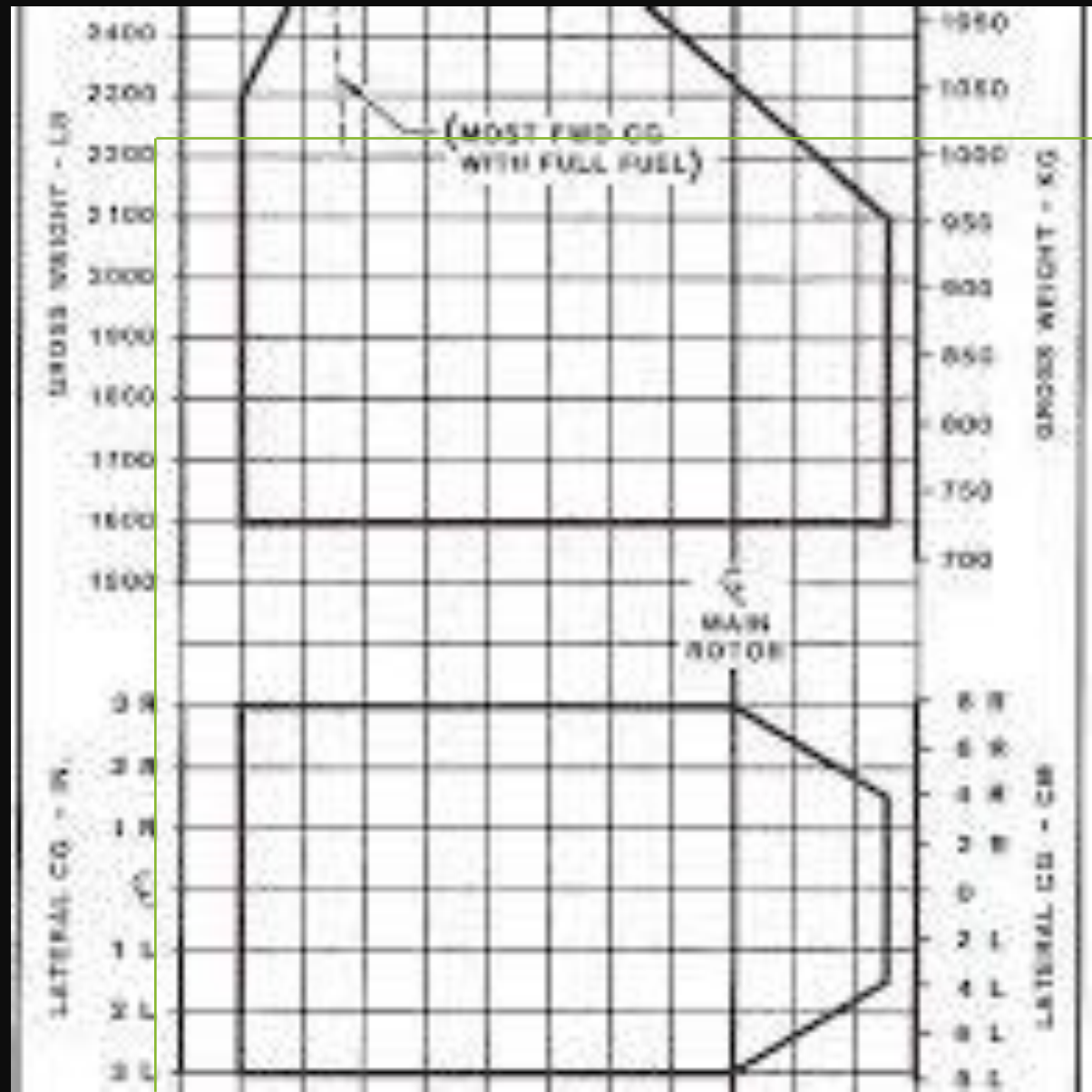
POWER CURVE

NORMAL OPERATIONS

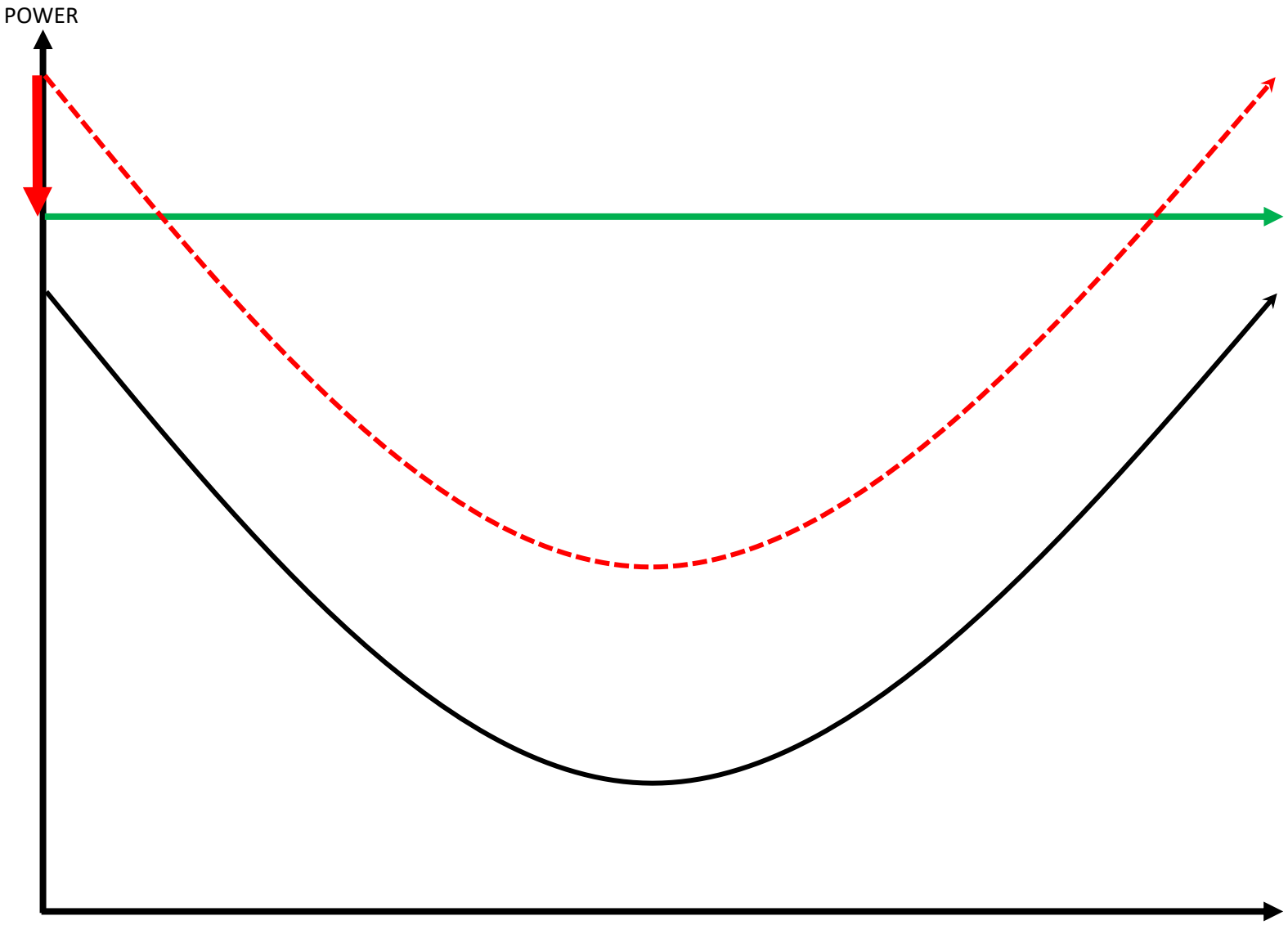

POWER
POWER MARGIN
POWER AVAILABLE / ENGINE POWER
POWER REQUIRED FOR STRAIGHT AND LEVEL FLIGHT
SPEED

HEAVY

- YOU NEED MORE LIFT TO OVERCOME THE WEIGHT
- THE POWER REQUIRED CURVE RISES



NO
POWER MARGIN
YOU CANNOT HOVER!!



NEW
POWER REQUIRED
FOR STRAIGHT AND
LEVEL FLIGHT
POWER
AVAILABLE /
ENGINE POWER

VIEW FROM THE INSIDE

VIEW FROM THE OUTSIDE

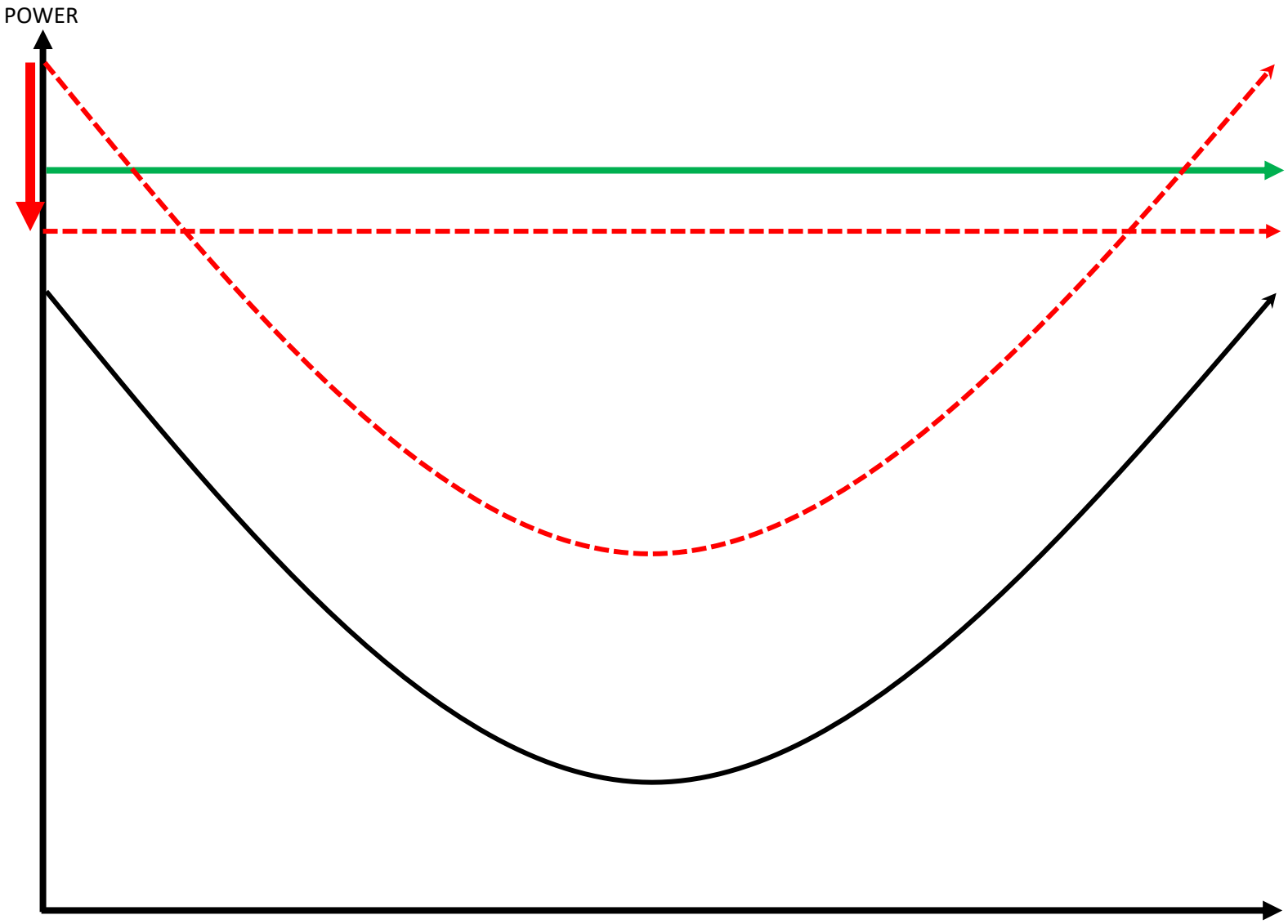
SOLUTION

- DO YOUR WEIGHT AND BALANCE CALCULATIONS!
- DO NOT FLY OVERWEIGHT!

HOT / HIGH / HUMID

- DENSITY ALTITUDE
- YOU NEED MORE LIFT TO OVERCOME THE REDUCED DENSITY
- YOUR ENGINE HAS REDUCED POWER DUE TO THE REDUCED DENSITY

NO
POWER MARGIN
YOU CANNOT HOVER!!



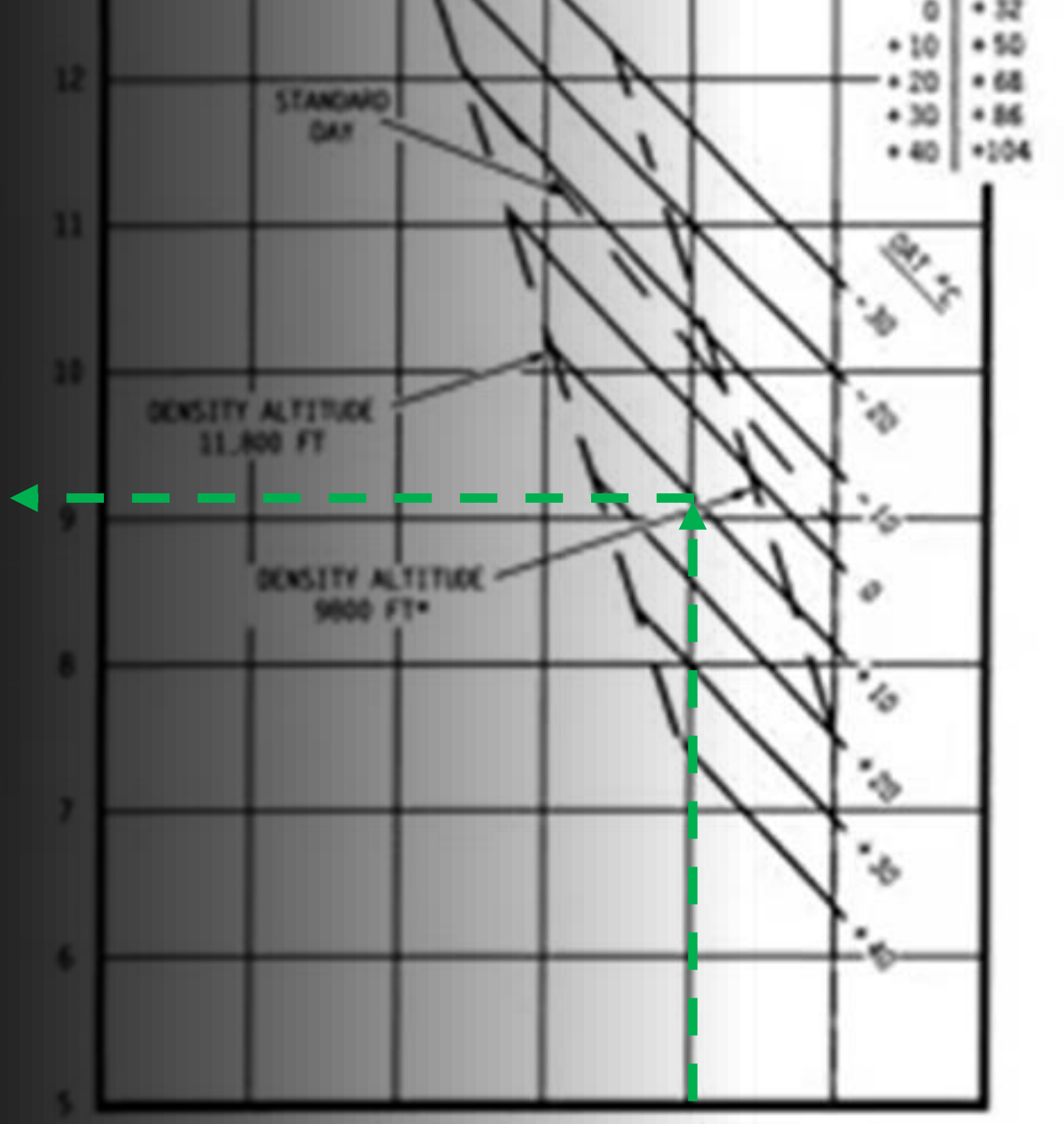
POWER REQUIRED INCREASED

REDUCED POWER AVAILABLE / ENGINE POWER

SOLUTION

- DO YOUR PERFORMANCE CALCULATIONS!
- DO YOUR POWER CHECK!

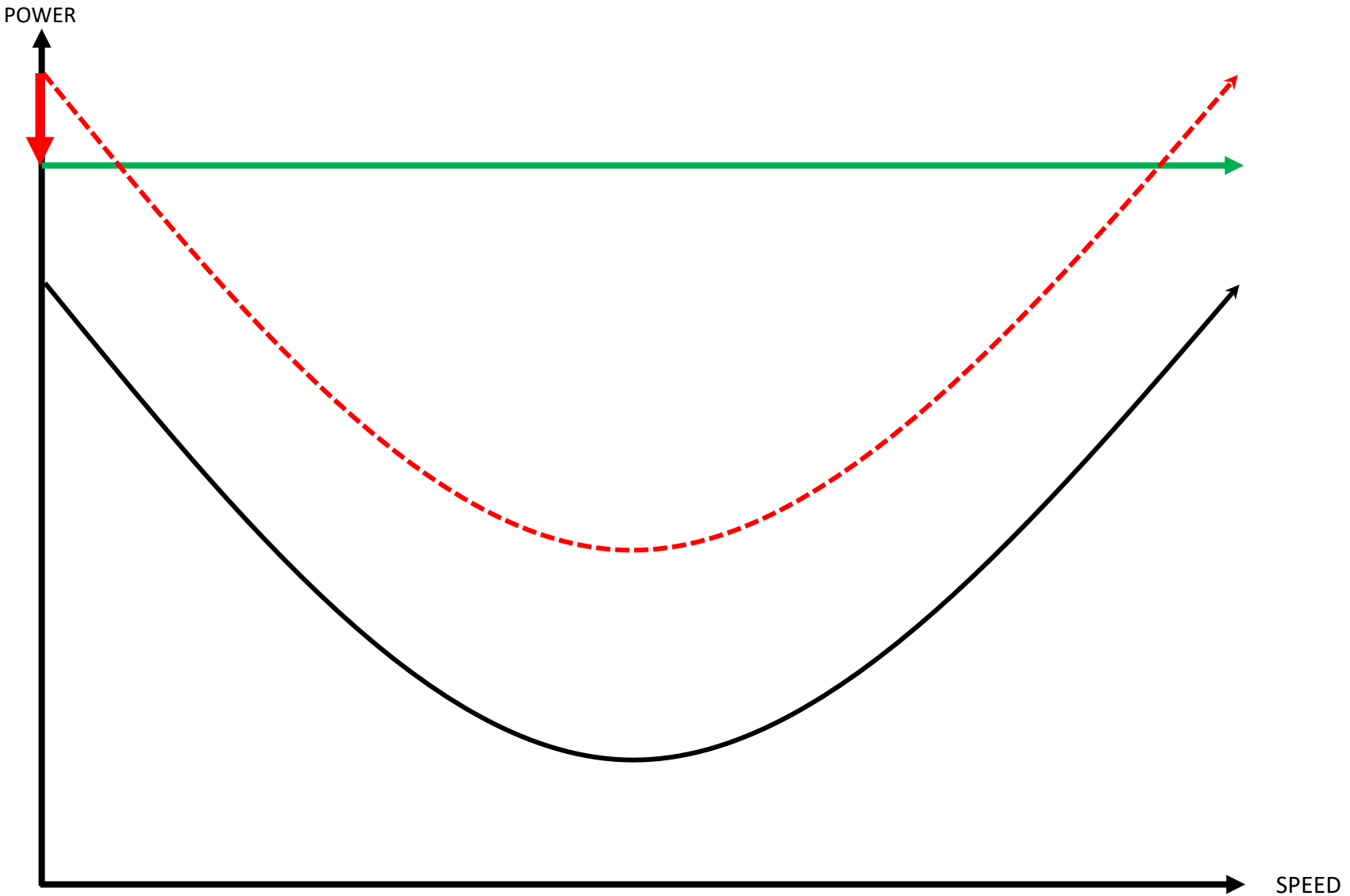
SECTION 5 – PERFORMANCE CALCULATION



CONTAMINATED ROTORS

- ICE / SNOW
- DIRT
- YOU NEED MORE POWER TO OVERCOME THE INCREASED DRAG AND REDUCED LIFT

NO
POWER MARGIN
YOU CANNOT HOVER!!



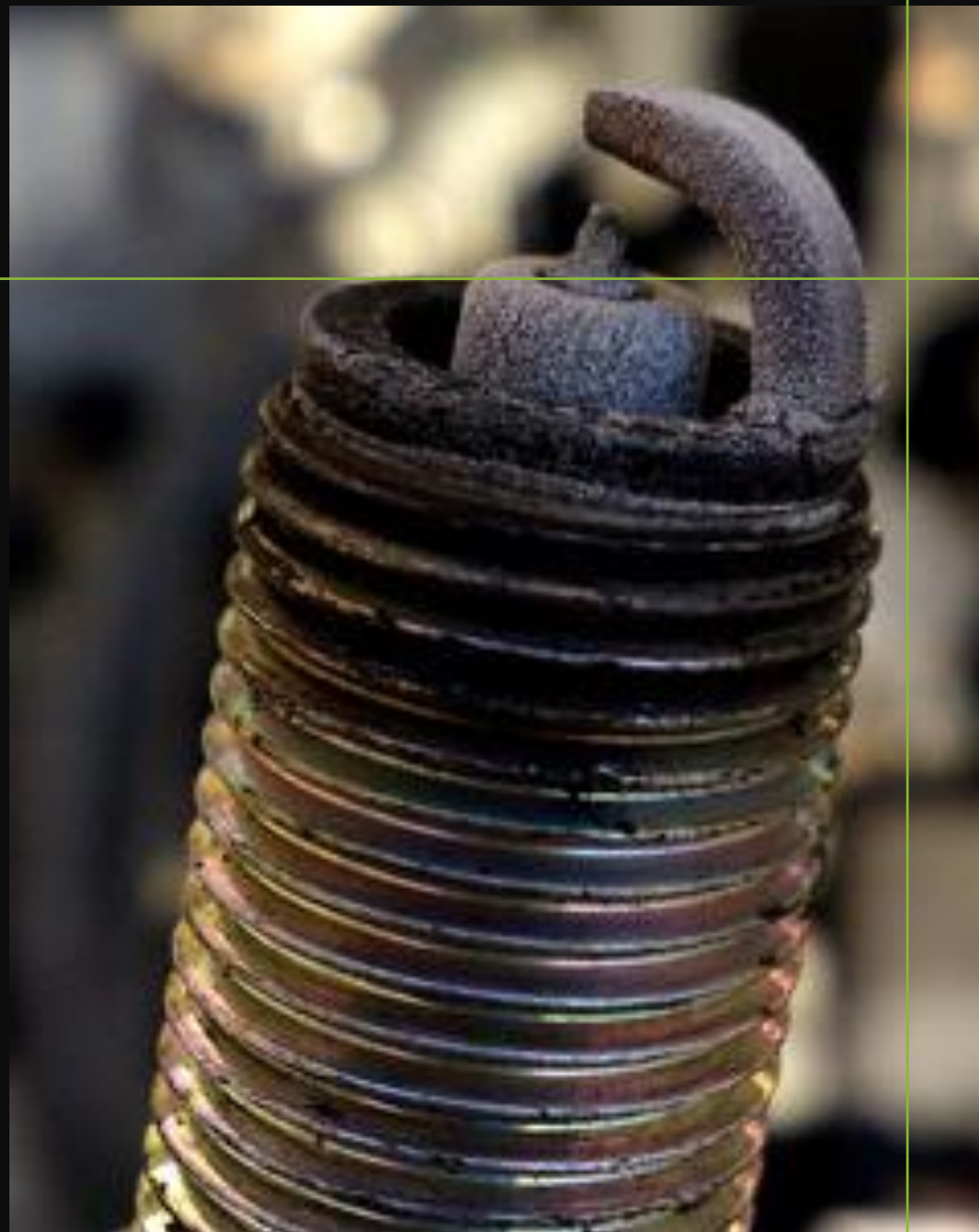

R66
TURBINE

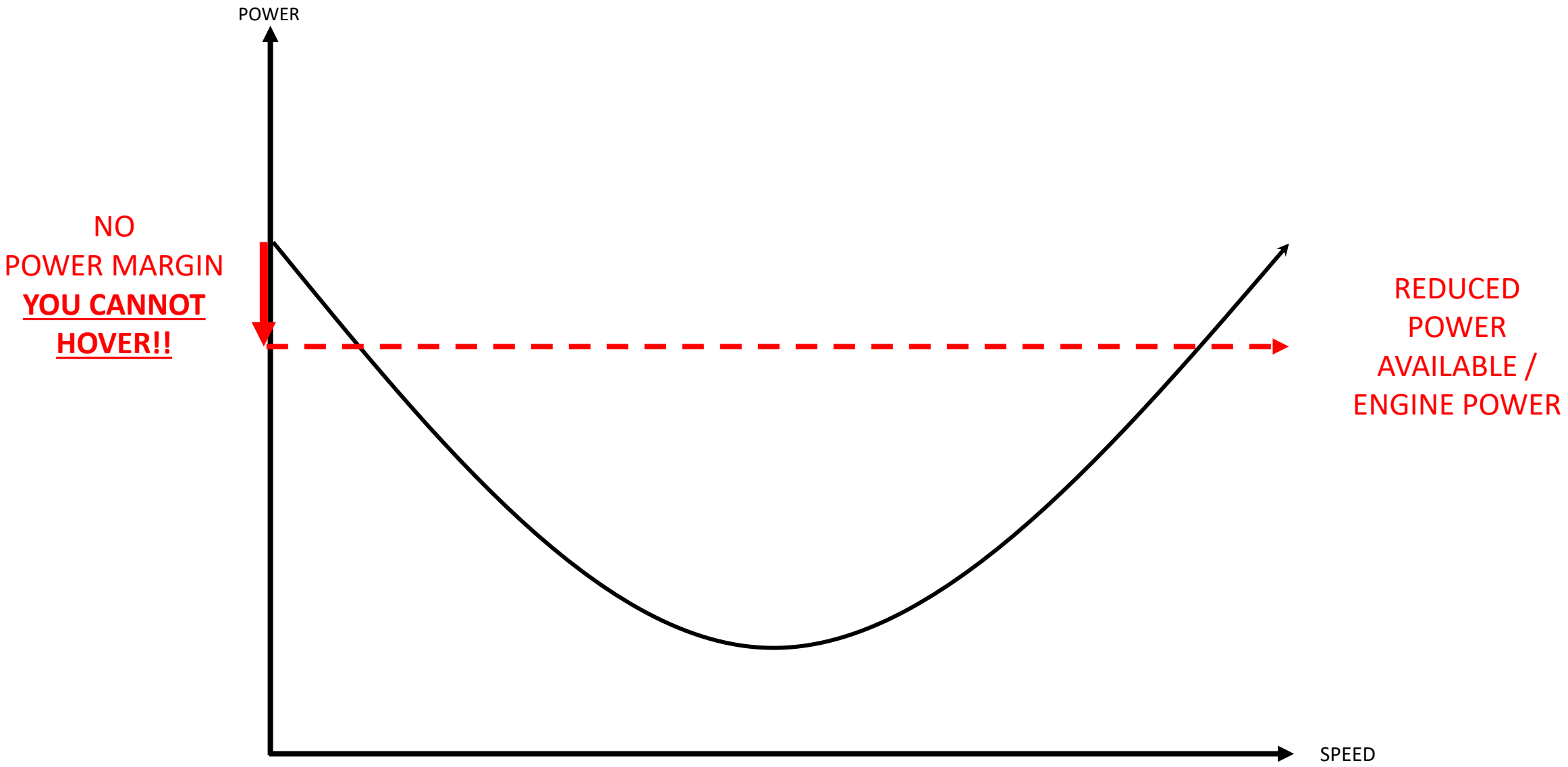
SOLUTION

- KEEP YOUR HELICOPTER CLEAN!

ENGINE PERFORMANCE DEGREDATION

- MAGNETO FAILURE / SPARK PLUG / CYLINDER
- CONTAMINATED / LOW GRADE FUEL
- POWER AVAILABLE REDUCES



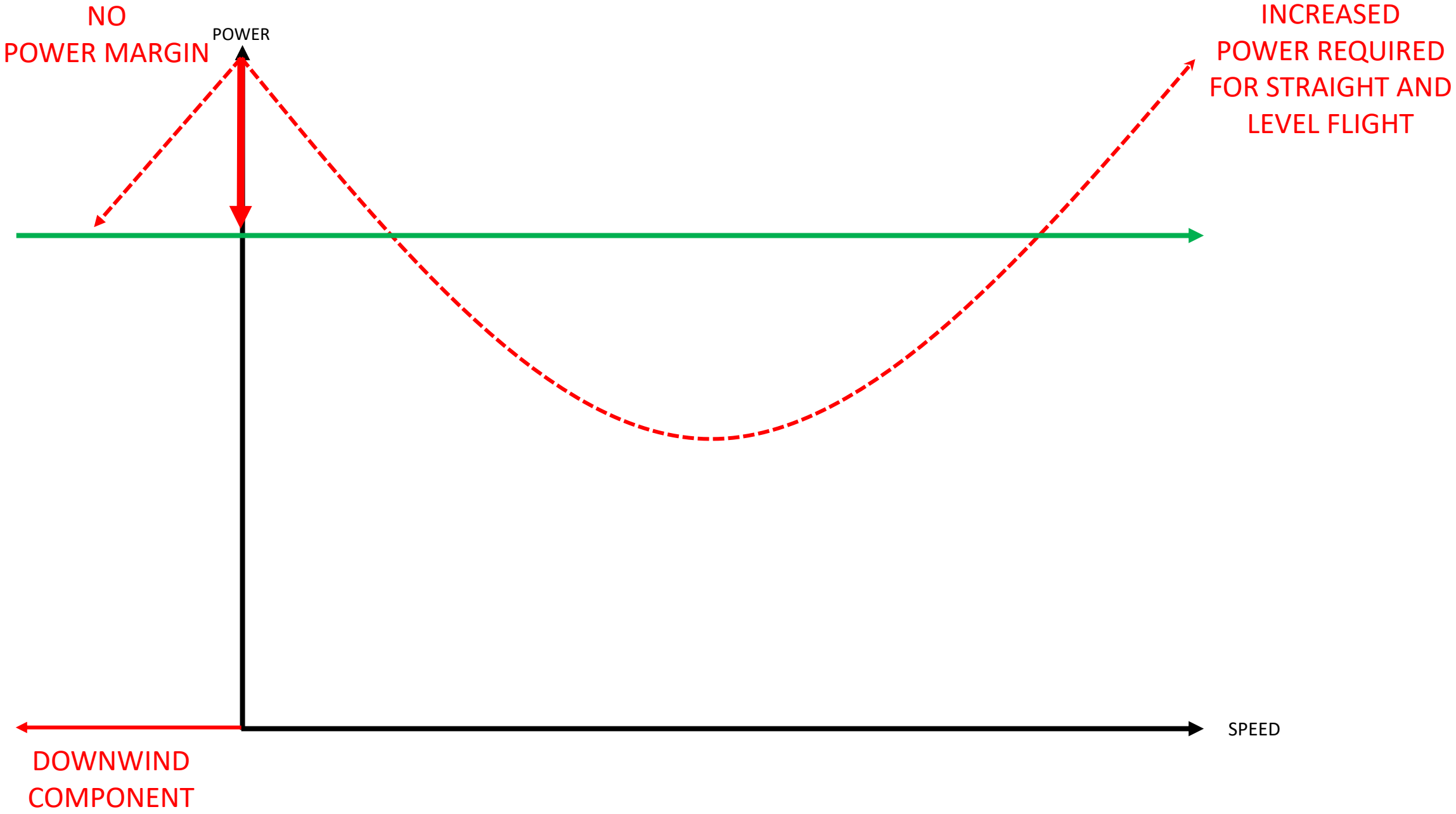

POWER
NO
POWER MARGIN
YOU CANNOT
HOVER!!
REDUCED
POWER
AVAILABLE /
ENGINE POWER
SPEED

SOLUTION

- LOW POWER / RUNNING LANDING

DOWNWIND APPROACH

- POWER REQUIRED CURVE MOVES UP WITH THE DOWNWIND COMPONENT


NO
POWER MARGIN
POWER
INCREASED
POWER REQUIRED
FOR STRAIGHT AND
LEVEL FLIGHT
SPEED
DOWNWIND
COMPONENT

CRASH OR RECOVERY

- **CRASH..**
- DUE TO AIRCRAFT SINK THE PILOT TENDS TO RAISE THE COLLECTIVE
- THIS LEADS TO INCREASED RATE OF DESCENT AND LOWER RPM
- WHICH LEADS TO ROTOR STALL AND CRASH
- **RECOVERY..**
- SIMULTANEOUSLY:
- OPEN THROTTLE – OVERCOME THE CORRELATOR
- LOWER COLLECTIVE – REDUCE DRAG
- HOWEVER,… THIS WILL LEAD TO INCREASED RATE OF DESCENT
- YOU *MIGHT* AVOID A HARD LANDING

HOW TO AVOID OVERPITCHING

- COMMONLY, OVERPITCHING IS CAUSED BY PILOT ERROR.
- ALWAYS PERFORM A WEIGHT AND BALANCE CALCULATION
- ALWAYS CHECK PERFORMANCE CALCULATIONS
- ALWAYS CHECK MCP AND 5 MIN T/O POWER PLACARD
- KEEP THE HELICOPTER CLEAN
- PERFORM A “HOVER POWER CHECK”
- PERFORM A “IN-FLIGHT POWER CHECK”
- ONCE OVERPITCHING OCCURS IT CAN BE TOO LATE TO RECOVER – GO AROUND EARLY!
- LEARN HOW TO RECOVER FROM LOW RPM
- LEARN HOW TO PERFORM A RUNNING LANDING

FURTHER READING

- R44 POH SECTION 3, 3-11
- R44 POH SECTION 10, SAFETY TIPS 9
- R44 POH SECTION 10, SAFETY NOTICE SN-10
- R44 EASA OSD, T.A.S.E
- EHEST HE12, HELICOPTER PERFORMANCE

BALEARIC
HELICOPTERS

THANK YOU FOR LISTENING