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Manager, Flight Test & Human Factors Branch, AIR-710
Federal Aviation Administration

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PILOT KNOWLEDGE AND PROFICIENCY (cont'd)

- Flight planning *(Ref SNs 15, 26, and 43)*
  - Thorough preflight inspection
  - Fuel
  - Weather
  - Performance (hot/high/loading)
- Distractions *(Ref SNs 16, 34, 36, and 41)*
  - Failure to keep eyes outside scanning for wires, other obstacles, and traffic
  - High workload missions such as photo flights
  - Passengers
  - Avionics
  - Cell phones
- Low-G and mast bumping *(Ref SNs 11, 29, and 32)*
  - Avoidance
    - Reduce airspeed in turbulence
    - Monitor airspeed when lightly loaded
    - Ensure passenger controls are removed
  - Recognition and recovery

CAUTION

Never practice/demonstrate low-G in flight. Low-G training should be knowledge based only.

- Low RPM considerations *(Ref SNs 10, 24, and 29)*
  - Recognition and recovery
- Power failures *(Ref SNs 10, 24, and 29)*
  - Instinctive autorotation entry
  - Continuously consider emergency landing sites throughout every flight
- Practice autorotations *(Ref SN 38)*
  - Proven, safe methods

CAUTION

In-flight practice of Low RPM, power failures, and autorotations should only be conducted under the supervision of an instructor.

- Confined area operations (Ref SN 22)
  - High and low reconnaissance
  - Assessing wind
  - Power margins

SAFETY NOTICES

The following Safety Notices have been issued by Robinson Helicopter Company as a result of various accidents and incidents. Studying the mistakes made by other pilots will help you avoid making the same errors. Safety Notices are available on the RHC website: www.robinsonheli.com.

SAFETY NOTICE	TITLE
SN-1	Inadvertent Actuation of Mixture Control in Flight
SN-9	Many Accidents Involve Dynamic Rollover
SN-10	Fatal Accidents Caused by Low RPM Rotor Stall
SN-11	Low-G Pushovers - Extremely Dangerous
SN-13	Do Not Attach Items to the Skids
SN-15	Fuel Exhaustion Can Be Fatal
SN-16	Power Lines Are Deadly
SN-17	Never Exit Helicopter with Engine Running Hold Controls When Boarding Passengers Never Land in Tall Dry Grass
SN-18	Loss of Visibility Can Be Fatal Overconfidence Prevails in Accidents
SN-19	Flying Low Over Water is Very Hazardous
SN-20	Beware of Demonstration or Initial Training Flights
SN-22	Vortex Ring State Avoidance, Recognition, and Recovery
SN-23	Walking into Tail Rotor Can Be Fatal
SN-24	Low RPM Rotor Stall Can Be Fatal
SN-25	Carburetor Ice
SN-26	Night Flight Plus Bad Weather Can Be Deadly
SN-27	Surprise Throttle Chops Can Be Deadly
SN-28	Listen for Impending Bearing Failure Clutch Light Warning
SN-29	Airplane Pilots High Risk When Flying Helicopters
SN-30	Loose Objects Can Be Fatal
SN-31	Governor Can Mask Carb Ice
SN-32	High Winds or Turbulence
SN-33	Drive Belt Slack
SN-34	Aerial Survey and Photo Flights - Very High Risk
SN-35	Flying Near Broadcast Towers
SN-36	Overspeeds During Liftoff
SN-37	Exceeding Approved Limitations Can Be Fatal
SN-38	Practice Autorotations Cause Many Training Accidents
SN-39	Unusual Vibration Can Indicate a Main Rotor Blade Crack
SN-40	Post-Crash Fires
SN-41	Pilot Distractions
SN-42	Unanticipated Yaw
SN-43	Use Extra Caution During Post-Maintenance Flights
SN-44	Carrying Passengers

ROBINSON
HELICOPTER COMPANY

Safety Notice SN-22

Issued: July 1986 Revised: June 1994; October 2016, January 2024

VORTEX RING STATE AVOIDANCE, RECOGNITION, AND RECOVERY

A vertical descent or steep approach, particularly downwind, can cause the rotor to fly into its own downwash. At certain descent rates, large vortices develop as the downwash is recirculated through the rotor disk. This condition is known as vortex ring state (VRS). Once VRS exists, adding power (raising collective) can unexpectedly increase descent rate due to the increase in downwash recirculating through the rotor. Recovery can only be accomplished by moving the rotor disk out of its own downwash.

To avoid VRS, reduce rate of descent before reducing airspeed. A good rule to follow is never allow your airspeed to be less than 30 knots until your rate of descent is less than 300 feet per minute.

Signs that VRS is developing include increased vibration levels, decreased control authority ("mushy controls"), and a rapid increase in sink rate. Pilots should always be aware of wind conditions and plan descents to avoid VRS. Pilots should be particularly alert to the possibility of VRS during OGE hover operations or steep approaches.

A recovery should be initiated as soon as VRS is suspected. Early recognition and immediate recovery by moving the rotor out of its downwash is essential. Large control inputs are not necessary and should be avoided. After recovery, increasing collective and/or airspeed will help to avoid re-entering VRS.

Safety Notice SN-23

Issued: Jul 86 Rev: Jun 94

WALKING INTO TAIL ROTOR CAN BE FATAL

Non-pilot passengers have been killed by inadvertently walking into a rotating tail rotor. Every possible precaution must be taken by the pilot to prevent this tragic type of accident. The following rules should always be observed:

1) Never allow anyone to approach the helicopter unless they are escorted or have been properly instructed. If necessary, shut down and stop rotors before boarding passengers.

2) Always have strobe light flashing when rotors are turning.

3) Instruct passengers to establish and maintain eye contact with pilot when approaching helicopter. (This will force them to approach only from the nose or side, never the tail).

4) Instruct passengers to leave the helicopter in full view of the pilot and walk only around the nose, never the tail.

5) Be especially careful when landing off airports as unseen children or adults might approach the helicopter from the rear.