



# Psychological tests for pilots Hype or necessity?



YOU GET A PSYCHOLOGICAL TEST BEFORE ADMISSION TO THE AVIATION ACADEMY AND OFTEN ALSO ONE AS YOU APPLY WITH AN AIRLINE. BUT WHAT ACTUALLY IS THE PURPOSE OF THESE TESTS?

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## People differ

People differ and consequently there is a difference in their performance. Therefore, aviation psychologists have designed methods to select people who have the abilities and attitudes required for flying an airplane. For the testing of pilots, they have developed worldwide applicable selection systems like the Global Pilot Selection System. These systems comprise tests which are connected with cognition, flying aptitude and personality.

### COGNITION & FLYING APTITUDE

GENERAL INTELLIGENCE

NUMERICAL ABILITY

CRITICAL THINKING

LOGICAL REASONING

ANALYTICAL THINKING

PLANNING

PERCEPTUAL ACCURACY

SITUATIONAL AWARENESS

GEOGRAPHICAL AND SPATIAL ORIENTATION

MULTITASKING

AUDITORY AND VISUAL MEMORY

ENGLISH PROFICIENCY

### COGNITION AND FLYING APTITUDE

Cognition and flying aptitude relates to general intelligence, numerical ability, critical thinking, logical reasoning, analytical thinking, planning. But also perceptual accuracy, situational awareness, geographical and spatial orientation, multitasking, auditory and visual memory, English proficiency.

### PREVENTION OF AIRCRAFT INCIDENTS

The right cognitive abilities and flying aptitude are important in the prevention of aircraft incidents and airspace violations. Let us look at some errors.

#### FALSE ASSUMPTIONS

False assumptions and customs occur regularly. An example from practice. A leakage causes an extra fast kerosine use. Of course, the crew is not informed about this and signals that a tank is still almost full, while the other one is almost empty. The first mistake which is being made here is that the extra fast kerosine use is not being noticed. In view of the balance, one pumps over half of the other full tank to the empty tank. When, after a lapse of time, the fuel gauge turns red again, the crew makes the second mistake. That is, after several procedural checks, the crew thinks that a failure of the fuel gauge is at hand and does not believe that the fast use can be caused by a leakage. One does not have enough fuel to stay in the air, so one has to make a turnaround to the nearest airport. Should one have believed the fuel gauges, one should not have proceeded to this fatal pumping over.

#### TACTICAL DECISION ERRORS

But also the way people process information is important. This comprises their perceptual accuracy, their attention, their decision making. With most incidents, tactical decision errors occur.

Then, the pilot is not able to change a way of doing in reaction on a signal to do that. The most important error that falls under this chapter is, that the crew does not



succeed to execute a go around when an unstable approach situation asks for it. Pilots can be troubled by “get-there-itis”. Consequently, they have difficulty to acknowledge the necessity to revise a plan of action when circumstances are changing. This happens in particular when the plan is routine and the purpose, for example landing, is almost reached.



**FLIGHT DECK AIRBUS A380**

A new challenge is the developing cockpit automation. We aim at the so called glass cockpit's and fly-by-wire-steering. Due to this, pilot tasks are in danger of becoming more monotonous. Psychologists can help to face this new challenge, for example by, in the selection of pilots, paying more attention to long term attention.

## **PERSONALITY**

Personality has to do with leadership, emotional stability, decision making, behaviour in particular situations. Equally, personality is important in the prevention of incidents. Personality characteristics that, according to the airlines, are undesirable for a pilot are: excessively aggressive, impulsive, sensitive to tension and stress, aversion against authority, not in balance with the environment, big ego and therefore over-sensitive to criticism about his flying abilities.

Bad life habits are at any times entirely wrong. An example from practice. During a security control, a pilot as tight as a drum was arrested right before he wanted to



board his Boeing 767 of American Airlines. Pilot James Yales wanted to go flying from Manchester tot Chicago with 181 passengers on board. During the control, it was find out that he had 6,5 times the admitted amount of alcohol in his blood.

### REPRESENTATIVE OF THE AIRLINE

A pilot is more than somebody who flies an aircraft from A towards B, but is also a representative of the airline. A pilot must be able to identify himself with the airline. One therefore has to check, if that “fit” is present. A new challenge from the environment of the company are the safety threats. .



### OVERWHELMING NIGERIAN TERRORIST BY JASPER SCHURINGA

An example from practice. It was a 32 years old Dutchman who probably counteracted the attack on flight NW 253 from Schiphol towards Detroit. Jasper Schuringa threw himself on the Nigerian terrorist and hold him in the lock till after the landing. Psychologists can help to face this new challenge, for example by, in the selection of pilots, paying more attention to mental defensibility.



## COMPETENCES

SENSE OF RESPONSIBILITY

LEADERSHIP CAPACITIES

STRESS-TOLERANCE

REACTING ALERT AND  
DECISIVE

ACCURATE WORK ATTITUDE

ABILITY TO WORK IN TEAMS

SPEAKING AND WRITING  
SKILLS.

## COORDINATION OF THE CREW

Aircrafts have become bigger and bigger. A modern aircraft like the Airbus A380 all soon has 24 flight attendants on board. Many incidents occur due to a bad coordination of the crew. An example from practice. The captain had enough qualified people at his disposal to be sure that a problem with the landing gear signal was investigated while the airplane was flown to its destination. However, the tasks were not clearly allocated or communicated to the crew. The consequence was, that everybody, including the captain, was trying to solve the problem of the landing gear signal, but nobody factually flew the airplane.

A lot of incidents happen when the first officer so far has only minor flying experience in contrast with the captain, the captain flies the airplane and both are not familiar with each other since it is the first day that they are flying together. In that cases, selection of pilots on stressmanagement, situational leadership, teamwork, conflict handling and assertiveness of the first officer can be usefull.

## IN DEPTH-INTERVIEW AND SIMULATIONS

Therefore, irrespective of psychological tests, an in depth-interview is being hold, sometimes also with simulations (role plays and cases). All results are compared with norms which are valid for pilot (for example: Ab Initio or Experienced). This all results in an extensive report. In it, a score is given for competences which the concerning airlines like to be reflected in their pilots.

Among them are: sense of responsibility, leadership capacities, stress-tolerance, reacting alert and decisive. But also accurate work attitude, ability to work in teams, speaking and writing skills.

## CONCLUSION

Psychological testing of pilots is not a hype, but a necessity. The safety, quality and efficiency of the operations in air traffic have been improved, probably partially or to a large extent by a decrease of the number of crew related incidents. The air traffic area fortunately has given more and more attention to Human Factor topics. At the same time new challenges arise from the environment of the company. Psychologists can help to face these new challenges, among others by a good selection.

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