

CASE STUDY : Emirates Airline

English Language Proficiency Prevents Air Disasters

Emirates Airlines Certifies Crews with Test that Simulates Radiotelephonic Communication

In 1996, 349 passengers and crew were killed when two planes collided mid-air over New Dehli. This accident was attributed in part to language barriers that retarded radiotelephony communication between the flight and ground crew.

According to aviation experts Jason Park and Tyler Kong, "...the lack of ability for all parties involved to understand crucial directions via common English may have been the most important contributing factor leading to [this tragedy]. Without agreed upon standards for English proficiency and common phraseology, the aviation industry continues to be at risk for future language-related accidents. Air traffic communications often deviate from standard phraseology in emergency situations towards a more conversational style. English proficiency beyond the basic understanding of aviation phraseology may be necessary."

In order to address this threat, the International Civil Aviation Organization (ICAO) passed a resolution that stated, "The air-ground radiotelephony communications shall be conducted in the language normally used by the station on the ground or in the English language." Furthermore, "the English language shall be available, on request from any aircraft station, at all stations on the ground serving designated airports and routes used by international air services."

The ICAO resolution further mandated that effective March 2008 (now virtually extended to March 2011), pilots cannot be certified to fly unless their English communication skills meet ICAO established criteria. Air traffic controllers and aeronautical station operators must also demonstrate English proficiency.



Emirates Airlines Seeks Automated Solution to Test Spoken English Skills

Emirates Airlines needed an efficient and reliable solution to certify more than 1,150 pilots and air traffic controllers in time for the ICAO deadline. In May 2007 they turned to their training provider, the Emirates Aviation College (EAC) to find a time and cost effective solution. EAC, who was already using the Jeppesen 96-hour English training program for Aviation, then adopted its ICAO English Certification solution. This innovative solution includes the Versant Aviation English Test (VAET), developed by Pearson's Knowledge Technologies group and administered by Jeppesen and approved by the General Civil Aviation Authority of UAE.

Automated Test Evaluates Both Aviation and General English Skills

The VAET is a fully-automated listening and speaking test designed to measure the ability of pilots, air traffic controllers and other airline crew, to accurately communicate in English. Test administration – proctored in Jeppesen-approved testing centers – is more efficient than traditional methods because test-takers use a computer or a phone to take the VAET. The test was developed under a cooperative research and development agreement with the U.S. Federal Aviation Administration (FAA). VAET assesses both spoken aviation

English and general English skills as specified by ICAO, in an authentic voice-only manner that simulates the radiotelephony communication used on the job. Emirates Aviation College had used other traditional testing methods in the past. After trying the VAET, they were impressed with the innovative VAET solution.

According to Emirates Aviation College, the VAET's key advantages are:

- Tests are scored automatically and objectively and results are available within minutes.
- The voice-only testing process is authentic to the way pilots and air traffic controllers conduct radiotelephony communications.
- The test takes only 30 minutes to complete.
- The test can be taken anytime.
- Multiple tests can be administered simultaneously.
- Test results are consistent with human ratings.

Emirates Airlines Meets an Impossible Deadline

The ICAO deadline was extremely short and Emirates Airlines needed a consistent solution that could be administered efficiently to thousands of aviation staff, and that delivers results fast. The Versant test was the only solution that could manage these demands. In 2007, EAC began testing pilots and air traffic controllers and was able to certify everyone in less than a year. According to EAC, the ease and speed of administration and test taking was the reason why Emirates Airlines was able to make the ICAO deadline.

"Administration of this test was much simpler than other solutions," said Thelma Sanchez, Course Support

"English is the universal language for aviation. The Versant Aviation English Test assesses English proficiency accurately and reliably so airlines can be confident that their flight crews meet the ICAO standards for proficiency."

— Capt. Mark Patterson, Training Center Manager —
Eastern Hemisphere Jeppesen



Coordinator with Air Traffic Management, Emirates Aviation College. "It can be taken by phone or computer and does not require human judges, which saved us countless hours of certified examiner time. We saved time and money and were able to make an impossible deadline."

According to EAC, the most important advantage of the VAET is the immediate availability of results and reliable results. While other solutions can take as much as a week to produce results, the VAET certification test is scored automatically using the patented Ordinate scoring system. Not only does this system provide immediate results, it is also highly reliable. With machine scoring there, human examiner bias or inconsistencies are eliminated. The VAET is the only test that is scored automatically using advanced speech recognition technology.

"Lives are on the line if pilots can't communicate accurately and efficiently, so an English certification test has to be extremely reliable," said Lynn Streeter, President of Pearson's Knowledge Technologies. "There is not room for human error and that is why airlines depend on the VAET."

Versant Aviation English Test Results are Identical to Expert Human Scorers

The VAET was built in conjunction with the FAA by a cross-disciplined team of experts in aviation, test development, linguistics and psychometrics, using a proven, scientific development process. Being that the stakes are so high for this certification, Pearson did exhaustive field testing prior to releasing the product to determine if its

automated scoring was as accurate as expert human scoring results.

The field test sample included 1,250 pilots and air traffic controllers who were both native and non-native English speakers. The sample subjects were from 90 different countries and spoke 50 different native languages. Using careful human transcriptions and human ratings of the VAET test items, test taker responses were analyzed and scored without automatic speech processing technologies. These human-generated scores were then compared with the machine-generated scores to determine the accuracy of the automatic scoring.

The results show a clear trend, indicating that for every case evaluated, the scores generated by machine and by expert human raters are closely aligned. In addition, a strong correlation was found for each of the ICAO sub-scores. These correlations indicate that the machine-generated scores for the VAET systematically correspond with human-generated scores 97% of the time, providing evidence that the automatically generated scores are virtually the same as those of ICAO expert raters.

For more information, see the *Versant Aviation English Test: Test Description and Validation Summary* available by request from sales@pearsonkt.com.

Ordinate Testing Technology

Ordinate, creator of the Versant tests, has been combined with Pearson's Knowledge Technologies group. Ordinate has been producing automated spoken language tests since 1996 and is the leader in the field. The patented Ordinate[®] automated testing system was developed to apply advanced speech recognition techniques and data collection via the telephone to the evaluation of language skills. The system includes automatic telephone reply procedures, dedicated speech recognizers, speech analyzers, databanks for digital storage of speech samples, and scoring report generators linked to the Internet.

Pearson's Versant English Test is the result of years of research in speech recognition, statistical modeling, linguistics, and testing theory. Ordinate scoring technology has been applied primarily to Pearson's own language tests, such as the Versant series, but also to customized tests. Applications of Ordinate technology include assessment of spoken English, children's reading proficiency, adult literacy assessment, and the collection and human rating of spoken language samples.



Contact Us

To try a sample test or get more information, contact us at:

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