



Committed to safety – flight test engineer Ina Niewind

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By Lena Fuhrmann

While pilots at the controls of an F-4F Phantom II or Eurofighter conduct test flights at altitudes of several thousand metres, their 'client' stands on the ground below; extremely concentrated, Ina Niewind scrutinises the display screens and flight charts, speaks with the pilots and checks altitude, speed and other data. The events taking place in the sky would not be possible without her. At 30 years of age, Ina works in a profession where women are still all underrepresented. As a flight test engineer at the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), Niewind ensures that aircraft will be able to operate even more safely in the future. She prepares flight tests, defines the test plans, reviews the responses of the aircraft and the reactions of the pilot, and, afterwards, carefully evaluates the results.

Ina Niewind has been in charge of the DLR Institute of Flight Systems field office at Manching, near Ingolstadt in southern Germany for the past year; the Institute is responsible for supporting German Armed Forces engineers in the evaluation of aircraft. Together with a handful of colleagues, Niewind works for the branch of the Defence Engineering Services (Wehrtechnische Dienststellen; WTD) that is responsible for airworthiness testing and certification of aeronautical equipment for the German Armed Forces, known as WTD 61. The Bundeswehr Technical and Airworthiness Center for Aircraft (Wehrtechnische Dienststelle für Luftfahrzeuge – Musterprüfwesen für Luftfahrtgerät der Bundeswehr), as WTD 61 is formally called, is part of the Federal Office of Defence Technology and Procurement (Bundesamt für Wehrtechnik und Beschaffung; BWB).

Jets are not the only aircraft tested by her; at the moment, she is working on the A400M transport aircraft. "Since the A400M hasn't been delivered yet we have to use its predecessor, the C-160 Transall, as a test subject instead," Ina explains. To do so, she went out testing the characteristics of Germany's soil for the first time. The transport aircraft must be able to land on grass, so a suitable grass landing strip was needed; initial trials with the C-160 Transall were favourable, and tests with the A400M are now being planned. During flight tests with this transport aircraft, Niewind is often in the cockpit herself as there is substantially more room than in a jet. Being closer to what is happening, she can experience the effects of the tests first hand. "It is tremendously helpful to be on board the aircraft," she says.

Even when she was in school, Ina Niewind knew that she was interested in a mathematical or technical career. After obtaining her high school diploma – the German Abitur – she was sure that she would go on to study aerospace technology. A trainee placement in the flight-testing field sparked her interest in aviation. Nevertheless, Niewind's undergraduate dissertation was on the subject of unmanned aircraft, known as UAVs. "Ironically, for my doctorate, I'm doing exactly the opposite; I am investigating pilots' behaviour in aircraft," says Niewind with a laugh. On completion of her undergraduate dissertation, she first worked at the Institute of Aerospace Systems at the Technische Universität Braunschweig, but shortly after she started working for EADS, the European Aeronautic Defence and Space Company. She landed at DLR through a telephone call; at that moment, her former tutor was in charge of the DLR field office in Manching and wanted her in his team. Shortly after, Niewind joined DLR as a member of its scientific staff.

Simulator flights for the A400M

"Two months later, I was already supervising the first simulator campaign for the A400M," Ina recalls. The simulator is able to identify various manoeuvres on the ground that may give rise to problems in flight. Of course, the final confirmation must be delivered by the flight tests, but a

great deal can be 'flown' on the simulator with no safety risk. "Our job was to test in advance whether certain flight test techniques that had been established on highly manoeuvrable jets could be transferred to the A400M." Here, she worked with her colleagues at DLR Braunschweig, who programmed the simulator in accordance with her specifications. "The task could not be accomplished by one person alone; teamwork is very important," she says. Niewind spent three days with the test pilots from WTD 61 in Braunschweig; they flew in virtual reality with very realistic flight characteristics. She was involved in the preparatory work and subsequent evaluation for a total of three months. Ina has now become the Project Manager for DLR activities associated with the A400M trials, as well as being involved in testing the Eurofighter and the F-4F. "The Eurofighter is a manoeuvrable jet while the A400M is a heavy transporter. Even though these two aircraft are very different they share a lot of common ground," explains Niewind.

In 2009, she trained as a flight test engineer at the National Test Pilot School (NTPS) in the Californian Mojave desert. Back to school for four months, she attended lectures by experienced test pilots and former astronauts on the subject of flight test techniques. Here, budding flight test engineers learned things such as how to approach a runway correctly when landing an aircraft. Once the theory had been absorbed, the course switched to practical applications. Teamed with a test pilot, Niewind put her newly acquired knowledge into practice during flight tests. Flight test engineer jobs are highly sought after. Alongside top scores in aerospace technology and satisfied employers, a little luck is also called for. Only a few people are given the opportunity by their employers to attend this expensive training course.

Ina Niewind's day is tightly scheduled. Flying is a profession for 'early birds'; she starts working at 06:30. "The first thing I do is check my emails. Besides the various campaigns I'm involved in I must also take care of a lot of organisational work or check reports," she explains. On average, Niewind takes a seat in the cockpit of the Transall every three or four weeks. "Flying the transporter is charming in its own way - it is very much a shared group experience." In her capacity as flight engineer, she must check the many documents relating to the A400M that she receives from the Airbus headquarters in Toulouse. After a long day's work, she – naturally enough – is drawn back up into the air. Niewind has a pilot's licence for small aircraft but also enjoys simply being in the passenger seat, for example during aerobatics sessions. Once her feet are back on the ground, she engages in a great deal of sport and is enrolled in a Spanish at evening school "because it is a beautiful language that I have always wanted to learn." On top of it all, Ina is also working on her doctoral thesis.

What are her plans for the future? "I hope to have finished my doctorate within the next two years. My wish would also be to increase the size of the team at this site, which would enable us to provide support for more aircraft or helicopters. That aside, I am amazingly lucky to be working in my dream job." Another dream was fulfilled last March, when Niewind was allowed to join the pilot during the flight tests of an F-4F Phantom II. "That is something very different from sitting in a transport aircraft. The clouds looked almost close enough to touch," she says. Ina was able to fly the aircraft herself, including performing loops and steeply banked turns, for part of the flight. In the process, she experienced gravitational acceleration several times. "My muscles really ached the next day," Niewind says, laughing.

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Ina Niewind beside a C-160 Transall



Flight test engineer Ina Niewind is currently working with the A400M transport aircraft. "Since the A400M hasn't been delivered yet we have to use its predecessor, the C-160 Transall, as a test subject instead," she explains. To do so, Ina went out testing the characteristics of Germany's soil for the first time. The transport aircraft must be able to land on grass, so a suitable grass landing strip was needed; initial trials with the C-160 Transall were favourable and tests with the A400M are now being planned.

Credit: DLR (CC-BY 3.0).

Shortly before takeoff in the F-4



For Ina Niewind, a small dream was fulfilled in March 2011 when she was allowed to join the pilot during flight tests of an F-4F Phantom II. "That is something very different from sitting in a transport aircraft. The clouds looked almost close enough to touch," says Niewind. For part of the flight, she flew the plane herself, including loops and steeply banked turns. In the process, she experienced gravitational acceleration several times.

Credit: DLR (CC-BY 3.0).

At work on the Transall



Flight test engineer Ina Niewind at work with Peter Rieg, the Transall loadmaster.

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