

Newsletter 2000

Edition No.3

Dear Reader,

Dear Friends of the Reinhardt Abraham Memorial Foundation,

This is the 3rd Edition of our Newsletter which is issued regularly on a yearly basis. With the year 2000 we entered already the 4th year of being since the Foundation was founded.

With quite some pride I am able to say that the infancy stage is behind us. All the essential programs which we aimed at are operational now.

In the past year our first American recipient of the RASf Stipendium Jenna M. Pike from the University of Washington completed successfully her program at the University of Berlin. Her successor Paige Le Rose arrived at Berlin shortly after Jenna had left, and she was succeeded October 99 by her Fellow-Student Justyn Egert.

Since the program was launched August 1997, eight Students have successfully completed the Trainee Program at Boeing, further three will join it this year.

The first German Student from the University of Berlin will resume his work at the University of Washington end of March 2000.

At the end of the year 2000, the Foundation will have supported altogether 15 students. We take pride of this significant achievement.

This outstanding „take-off“ of the Foundation could be achieved only thanks to Boeing's early Trainee Program offer and to the gen-

erous contributions of our donators and supporters in 1999 and the years before.

We hope that you will continue to support our valuable program for the benefit of our young talents – tomorrow's professionals in civil aviation.

For the new year 2000 all the best to all of you! Thank you very much!

Dr. Gerwin Dienger
Chairman of the Board of the
Deutsche Lufthansa Berlin-Foundation

Trainee At The Boeing Company (I)

***Experiences gained during a seven month internship
(April to November 1999)***

By Kai N. Singh

Some Introductory Words

'Unforgettable' – Nat King Cole probably found the best and shortest synopsis of what I will try to express in the following pages. I spent half a year in Service Engineering in Everett as a member of the propulsion group for 747/767 airplanes. I'm sure my descriptions won't begin to come close to the overwhelming impressions I had, however, I'll give it a try.

Everything Has A Beginning - and unfortunately an ending

Boeing – Music to my ears. I suppose most aerospace engineers, and those who want to become one, get this certain flickering in their eyes when they hear this name. What is it that causes this feeling of respect and childish euphoria? The first thing that comes to my mind is the 747 Jumbo Jet: every kid spreads its arms and buzzes around the room in S-turns. But the kids are not alone, even I would sometimes spread my arms in the hallway and virtually fly a 747.

I was coming out of a class when I met Andreas Reinke in the stairway of the ILR (Institut fuer Luft- und Raumfahrt – Institute of aerospace engineering). He had just returned from Seattle and we got into a conversation about some of the experiences he had during his internship. I was impressed. I completed the application package and joined the MTU (Motoren- und Turbinenunion) in Munich as an intern to improve my knowledge in the field of material testing of high temperature alloys. In September my dad called to tell me that I was invited to interview for the internship program in Berlin the following month. What should I expect?

I went to the interview. Dr. Heilhecker, the foundation representative at the university, introduced the foundation and its program. My turn for the interview was, as usual, almost last. Enough time for my nervousness to reach unknown heights. Just before exploding, Ron Bengelink, the Boeing representative, asked me in and we started talking. Hey, wait a minute, something was missing. Where, for god's sake did I leave my nervousness? I couldn't find it. It was gone. I returned to Munich and another impatient week passed by. A call from my Mum. "You've got a letter from the Lufthansa foundation, they chose you as one of the interns to go to Seattle."

But who were the other interns that were going to accompany me? There was Sandra Hirche who had been chosen with me out of the '98 group of applicants. And there was Dirk Krappel, who actually should have come a year earlier, but postponed it to this year due to personal reasons. We got to know each other during a couple of "preflight briefing meetings", where we exchanged

thoughts, expectations, and most importantly,



enthusiasm. We were full of curiosity and impatience. Fortunately, (magic) Andreas and Jens Wieske, another former intern at Boeing, joined our meetings and gave us a lot of interesting and very valuable information.

Some weeks prior to leaving, we were invited to Lufthansa-Technik in Hamburg, which is one of the two main pillars of the RASf (Reinhardt Abraham Studienfoerderung – Reinhardt Abraham Memorial Foundation). Having already met Dr. Dienger, Mr. Kreth and Dr. Heilhecker at the interview, we had a chance to meet with Marianne Reichow and Frank Jacob, two more members of the organizational crew of the foundation. Also present were Dr. Decher and Jenna Pike, professor and student from the UW.

We had a great day. We were shown around the maintenance facilities, where a B747-400 and an A340-200 were parked in the hangar. Walking through the B747-400 with partially installed seats was a fantastic feeling. When do you as a student really get the chance to be that close to such an aircraft and to walk around and spend as much time as you want, looking and admiring? Normally you would hear: "Seat 36C, down the isle, to your right." We also had the chance to look at the Ju-52, which was the initial reason for establishing the Deutsche Lufthansa Berlin-Stiftung (Deutsche Lufthansa Berlin Foundation). Unfortunately the airplane was being restored, but it still was an amazing moment to be so close to a major milestone in German aviation history.



Finally we were handed out our tickets for Seattle with lots of warm wishes but also advice to behave properly and not run Boeing into the ground. I hope we fulfilled the expectations - Boeing is still around.

The Wild Wild West - new world?

Not really. I had been to Vancouver, B.C., two years earlier on vacation, and visited many places in North America, including the Northwest. Certainly, every region and state has its own characteristic features that make it different, but it is always a question of what is appealing to you. The Northwest had it. I was fascinated by the natural combination of mountains and the sea. And the known friendliness and cordiality of the American and Canadian people completed this picture of (almost) paradise. I could hardly wait to put my feet back onto this ground.

We flew to Seattle from Vancouver in a DASH-8, but could not see the "Emerald City" during the landing approach due to the typical rainy weather. But who cares, it was April and we had plenty of time to experience the predicted exciting Seattle summer. We landed and were heartily received by Michelle Colby, the Boeing HR (Human Resources) Representative, and Jens Steinhagen, a student from the Fachhochschule Hamburg (Technical College Hamburg). After more than 15 hours of travelling I was worn, particularly from the lack of sleep during the last couple of nights before leaving due to several going away parties

Boeing had arranged for 15 days of hotel accommodation. In addition we had the choice of each of us getting a rental car for three days or one car for all of us for the du-

ration of nine days. Another advantage was that we were scheduled to begin work one week after our arrival, thus we had plenty of time to comfortably find accommodations and one of the most valuable goods in the US, a car. Since we all would follow a similar search scheme, we decided to take one car for nine days and to cruise around together. In retrospect, I affirm this decision.

Three Aliens, One Montclair – on tour

Driven by eagerness, we started exploring Seattle. What a wonderful city, though it was cold and rainy. But why complain, "... it is April and the summers are really great. You will see." To make long story short, we 'checked out' several areas for apartments that seemed to be reasonably located for a short commute to work but close enough to downtown to enjoy Seattle's social life. Both Sandra and I had assignments in Everett, whereas Dirk had rotating assignments in Everett, Renton, and Auburn. Since Dirk and I decided to be roommates, we had to pick a location where he could get to work without having to get up at 3 o'clock in the morning. Sandra decided to look for studios.

We finally ended up in Northgate, which is certainly not comparable to Fremont, Capitol Hill, Wallingford or Queen Anne, but unfortunately higher rents go along with their uniqueness, which is why we ended up living in Northgate. Looking back, it was not a wise decision. For those interested in university oriented lifestyle, the University-District is probably the best place to live.

There are several ways of getting to know about available apartments. First of all there is the newspaper, The Seattle Times, with the Sunday edition containing the greatest number and type of advertisements. The blackboard in the basement of the Students Union Building on the campus of the UW is another possibility as well as the Boeing classified ads. And finally there are the apartment complexes that seemed to be a very convenient way of getting a roof over your head. You simply go to the rental office and ask for information. Which is exactly what we did. Dirk and I got a 2-bedroom apartment and Sandra got a studio. Apartment complexes provide laundry facilities and sometimes a swimming pool, a gym and occasionally the worshipped 'hot tub'. To give

you an idea, the rent for our 2-bedroom apartment was \$755. A week after we arrived, we reported to work, another week later we moved into our apartments and were set.

BCAG, Service Engineering – “make the customer happy!”

The first Boeing day started with the obligatory drug test, visiting the social security administration and the famous signing ceremony. Now we were real Boeing employees in possession of a U.S. social security number. What a feeling. The next day, Friday 9 April, we reported to work. We were each picked up in the 40-88 building (half of the twin-towers) by her or his supervisor and taken to our individual work places. We all were pretty excited, what kind of work will we be told to do? Will we be able to meet our supervisor's expectations?

As mentioned in the introductory chapter, I spent seven months in the 747/767 propulsion group of Service Engineering. Like other aircraft manufacturers, Boeing does not design the propulsion systems itself but leaves this part up to experienced engine manufacturers like General Electric, Pratt & Whitney, Rolls-Royce, CFM International and others. The main purpose of SE is to provide worldwide technical support for all Boeing and Douglas product commercial transport airplanes, both in and out of production and to prevent and resolve in-service problems.

I worked in the 747/767 group under my supervisor, Rodney Somers. When he picked me up in the twin towers I was wearing a shirt, a tie and a jacket. A combination that soon turned out to not be appropriate. Meeting my colleagues for the first time, I noticed their friendliness and their curiosity towards me. But another striking feature was their clothing. It was Friday. To be more precise, it was casual Friday. This means that besides the treats (donuts, bagels etc.) being brought in, the people wore normal, casual clothes, as they would wear for golfing or other recreational activities. I also remember seeing yellow cowboy boots a number of times. I was told to quickly get rid of that 'formal' dress and return to 'normality'. I did and I have to admit that I felt very comfortable with this. Even on the rest of the workdays the clothing

would be much more casual than you will find it back home in Germany. And everybody is called by his or her first name.

During my time in the group I was instructed to do many different types of work. On my first job I had to deal with a repair scheme for a hot bond repair of composite fan thrust reverser sleeves of older engines. I was to develop the repair scheme. This gave me the opportunity to improve my knowledge about the buildup of engine cowling and thrust reverser sleeves with their honeycomb-sheet-metal-design. It also let me get a glimpse of the Boeing Standards system. Besides creating different documents, I completed the 'normal' telexes that were assigned to me by my colleagues. Being an intern, I had the advantage of working problems on a variety of subjects and this allowed me to learn many things about different engines. In SE I could gain the knowledge that I was not taught in school, all the problems that I never heard of while sitting in the 'jet engines design and development' classes.

One interesting experience I had was while working a problem concerning the "thrust lever angle resolver" assembly that is attached to the thrust levers. This problem led to several telexes being sent back and forth, creating a lot of confusion and surprise. It taught me a lesson about how diverse different cultures can be and that you have to be really careful in what you say and how you communicate information.

Working with the group and other colleagues was a good example of teamwork, even if you had totally different characters playing together. One thing was common to all of them, their readiness to help and support me in whatever problem or wish I had. The patience and friendliness of my colleagues helped me learn a lot and made my experience a very good one. Both of my leads, Michael Zimmer and Brian Striegel supported me with their comments and suggestions. Michael Zimmer, also being my mentor was always open for questions and available for help.

But all my time was not spent working telexes. One thing I loved to do was, from time to time, visit the factory and just walk around and enjoy seeing how the widebody aircraft were built up step by step and awakened to life. The final product could be seen (with glance in my

eyes) at the flightline, where they are parked to undergo final tests, repairs etc. This is one of the sites that I will miss most.

Orcas Island, N714TD, Flutter – Jimmy Hendrix and the Simpsons

Unnecessary to mention is the beauty of the landscape in the Northwest. Most of the free time elapsed on a project that Dirk and I had already planned in Berlin. Attaining the Private Pilot Certificate. Getting the license much cheaper than in Germany is one thing, the fun and the gorgeous view of the Puget Sound area from above, especially the San Juan Islands, is another. And I definitely wouldn't have wanted to miss that. After 48 total hours and a successful check-ride, I was



holding my license in hands.

A very impressive Boeing feature is their recreation facilities, sport associations, learning centers and much more. The off-hour courses also belong to that. The wide variety of courses includes technical issues on almost everything you could imagine: language, history, management, programming, the history of airbus to leadership and personality training. As a prerequisite for our pilot certificate, Dirk and I joined the Aviation

Ground School course. Another course we both chose to participate in was on aeroelasticity where we were introduced to the phenomena of flutter. Several seminars, mainly organized by our TEXPO-mentors, provided more interesting information.

A few words, regarding the weather. When we got to Seattle and we experienced Dr. Dienger's description of Seattle "Pouring, pouring, pouring", we were told that it is spring and that it will definitely change. Same thing in May. In June, people were wondering but still kept telling us that the summer will be great. Okay. July came quick, still no sign of summer. In August, people finally gave up. September provided a surprise with being sunny almost throughout the whole month. In October, the weather turned worse and now, in November, we are back to the spring conditions. What should I say? This is probably the shortest summer I have ever experienced.

Acknowledgements – the promised 'thank you' part

As recapitulation, I want to say: "It was great! Thank you for allowing students to get the opportunity to gain this fascinating experience." I don't want to summarize the past seven months; I simply could not. Just read the above.

But I want to thank several persons. Those who made the whole program possible and those who made my personal stay very pleasant and enjoyable.

Let me name some of them:

Dr. Dienger, Juergen Kreth, Dr. Heilhecker, Marianne Reichow, Frank W. Jacob, Ronald Bengelink, Robert Spitzer, Michelle Colby, Virginia Schlitzer, Rodney Somers, My Service Engineering Group, Prof. Haberland, Prof. Mertens, Prof. Hourmouziadis.

Trainee At The Boeing Company (II)

***Experiences gained during a seven month internship
(April to November 1999)***

By Dirk Krappel

Acknowledgments

Being the latecomer of the 1998 Reinhardt Abraham Memorial Foundation Trainee Program at Boeing, I want to take the opportunity to thank everybody of the foundation and the Boeing Company very much who enabled me after a nearly 4 years enduring disease to still participate in the Trainee Program when I got back to "normal" life. I appreciate this very much. It was a very uncomfortable situation for me to be the cause for considerable inconvenience and to be the 'enfant terrible' among the participants of this program. I want to address sincere thanks especially to the following persons for their warm support during that hard period:

Corey McMillan, Robert Schlilaty, Marianne Reichow, Dr.-Ing. Gerwin Dienger, Dipl.-Ing. Juergen Kreth, Ronald Bengelink, Virginia Schlitzer, Michelle Colby, Dr. Alfred Heilheker, Frank W. Jacob, Prof. Dr. Knut Wilhelm.

Takeoff into a new experience

After staying 3 weeks in a hospital during December 98, I got the final approval from my doctor to go for the Trainee Program at Boeing in spring and I felt very relieved about that. Influenced by the recent years, in which I went through the Chronic Fatigue Syndrome initiated by a virus infection, I was not sure what will expect me in Seattle and how the transition back to the regular working life will work out. In February, the other two participants in the Trainee Program, Kai Singh and Sandra Hirche, and me arranged an appointment with Andreas Reinke and Jens Wieske, two former participants of this program, who provided us with many hints and affected us with their enthusiasm, so that I couldn't wait to get to Boeing. At the beginning of March, we were invited by the Deutsche Lufthansa Berlin Stiftung for a visit to their office at the Lufthansa maintenance facilities in Hamburg, where we met Dr. Di-

enger, Juergen Kreth, Marianne Reichow, Frank Jacob, Prof. Reiner Decher from the University of Washington in SEA, who was in Berlin as a guest professor and Jenna Pike, the participant of the Student Exchange Program at the TU Berlin, which is also part of the support program by the Lufthansa Foundation. Besides a tour through the maintenance facilities of Lufthansa, Dr. Dienger handed us over the tickets for our trip to Seattle in a solemn moment of our visit. But the scheduled date of arrival was endangered until nearly the last minute by the American Embassy. As we received the notice of action from the American Immigration Board quite late there was just one week for applying for the visa at the American Embassy. We thought we have just to go there to get the stamp in our passport but that wasn't the case. Staff of the embassy told us that the whole process of issuing the visa would take at least 3 weeks due to reorganization of the embassy structure in Germany and that we can forget to go to Seattle on the scheduled flight the next week. Additionally, because my prime resident is still Bad Homburg I had to apply at the embassy in Frankfurt and there was no way to get the visa in Berlin. Therefore, I lost another valuable day for the visa process. Is it possible that after overcoming so much hurdles in the past the flight to Seattle had to be postponed for another time due to problems in issuing the visa on time? Fortunately, this time I was not the only one who is responsible upsetting already made arrangements! The subsequent days I spent mostly in talking to embassy staff, Marianne Reichow (she suffered a lot under me!) and Kai and Sandra. While the embassy in Berlin has a visa information hotline and Kai and Sandra knew already that they will get their visa in time, the embassy in Frankfurt don't have that luxury and nobody feels authorized to give such top secret and important information, not even a definite Yes or No. When the tension went to the apex a few days before the scheduled day of departure even Boeing intervened and sent a fax to the embassy. At the latest at that time, everybody at the Deutsche Lufthansa Berlin Stiftung and Boeing's international trainee program group knew me rather under the suffix "troublemaker" than my name. I think it is senseless to assure at this point that this is usually not my way in making memorable as nobody would believe me! Finally, one day before the departure date I got my visa, too and nothing

could have stopped me to get to Boeing except an aircraft crash. I think that was the day when Marianne had to apply for regimen to recover from the exertions I caused.

Seattle, we are coming (gracious god!) or the first weeks

After a long, long flight we arrived (without getting in trouble and arrested at the immigration!) in Seattle on April, 2 and were cordially welcome by Michelle Colby and Jens Steinhagen, another intern from Germany. We went out for dinner and it was then when I experienced the first and last disappointment during my stay here. I found a beverage on the menu which is called "Hefeweizen" and I thought by myself, wow, they have german "Weizenbier" here and I ordered one which turned out to be a mistake. The so-called hefeweizen was an American interpretation of that German masterpiece of brewing profession by Pyramid and after the first dram I was really shocked how strange a hefeweizen can taste! Concerning beer the Germans are really fastidious!

For getting around to find a residence and a (usable) car Boeing provided each of us a rental car for 3 days. We decided to take the rental cars successively and driving around together to have more time finding a car and apartments.

The first couple of days in a new country are always exciting and interesting. Although I had been to the US before which was more than ten years ago the environment was completely new to me. But it is very easy to get along here for a newcomer because of the overwhelming kindness and cooperativeness of the people. Furthermore we enjoyed the great support of Michelle who helped us a lot during the first days. Newcomers in Germany don't have it that easy, especially with regard to deal with the official machinery.

Kai and me decided before our arrival to share an apartment (he didn't know on what he got into sharing an apartment with me!) and we used the first days to get an orientation where to settle down. We weren't sure at which of the various Boeing locations we were going to work, so we decided to look for an apartment right in the geographic center of the various locations which is pretty much Seattle. On the other hand we wanted to be

right within the cultural city life. There are several ways in finding an apartment. One is to buy the newspaper (Sunday issue of Seattle Times is very helpful) and look in the advertisements. At 'Seven Eleven' or the gas station 'AM/PM' which is additionally one of the cheapest gas stations around provide also free journals with apartments in apartment complexes and also cars. Those are good sources, too. Then there is the UW with the HUB where a lot of ads are on boards. But many of the apartments offered there are pretty expensive or have a poor quality-price-ratio. Another possibility is to drive around those suburbs which look nice and go directly to apartment complexes to inquire for vacancy status and price. Apartment complexes have the advantage that they include quite often facilities for sports like gyms or swimming-pools and several other issues. The quality-price-ratio is good and the apartments are reasonably priced but it depends on the location. Seattle tends to be more expensive compared to the outskirts like Mountlake Terrace, Edmonds or Lynnwood, but on the other hand one has to accept a longer way to the city life of Seattle. Nice areas to live in Seattle are Fremont, around Greenlake and Wallingford which are reasonably prized regions but also Capitol Hill and University district which tend to be more expensive. We finally settled down in an apartment complex in Northgate directly opposite of the Northgate Mall. It is in the northern part of Seattle and isn't that far away from downtown. It also turned out that the heavy traffic starts south of Northgate towards downtown when coming home from work in Everett. The traffic situation around Seattle is usually bumper to bumper especially when everybody goes to or comes home from work.

When looking for a location to settle down everybody has to find an adequate compromise between the time one wants to spend to go to work (that means sleeping longer!) and the quality of living environment (equals density of cultural activities and bars in the direct vicinity). Kai had to work in Everett throughout the whole assignment whereas I had to go also to Auburn for 3 weeks which is pretty far (far is relative in the US!) south of Seattle so Northgate worked out very good for us. We also took a look at Everett as a possible location for residence in our first week but all 3 of us were nearly instantly unanimously of the opinion that this is not the right place for us and too far

away from Seattle for spontaneous activities. Because of the Boeing Facilities, Everett tends to be more expensive, too.

Concerning cars, the experiences of our predecessors in the trainee program are well documented in previous newsletters and made us sensitive for that item. A good source besides newspaper is the Boeing web with the classified ads. Both, Kai and me bought our car there. Used car dealers have a dubious reputation in the US and their profession is by many people considered to be in the same category as defrauders and delinquents. Due to a confined budget I was looking for a cheap car but it should be reliable. On the other hand, this was maybe the last opportunity to drive one of those highly gas consuming, fancy big American trucks like a Chevy Blazer or a Ford Bronco. Those requirements on a car are naturally a contradiction in itself (especially cheap, reliable and big!) and additionally many people recommended me not to buy such a truck as the affordable years are well known to be extremely prone to troublemaking. So, I dropped that infantile intention and I finally ended up with a Chevy S10 pickup from '82 for \$1100. Aside from a steering with much play and nearly no shock-absorbers left I didn't have any major problems (until now!) except a leaking seal common to the brake cylinder and a riding condition between the exhaust duct and the street which can be considered to be peanuts compared to other experiences or especially to the flaws of Sandra's cars. But, knocking on wood, my stay is not over, yet and who knows what happens tomorrow! Kai bought the biggest, cheapest, oldest and, as it turned out later, the most reliable car of all 3 of us.

The next step is to find a liability insurance which is not that easy as we join the most adverse constellation possible. To begin with, we are from another country and we don't have the American driving license, hence there doesn't exist a driver's record of us which increases as a result the premium to pay considerably. Also male policy holder and those under the age of 25 can reckon with a higher premium than female or aged over 25. Kai got a hint of a coworker to go to an insurance company called progressive and that's what we finally did.

After about one week we were settled in an apartment, had bought a car and were ready to start working at Boeing. Unlike our predecessors of the RASF we were lucky to have the luxury of one week for organizing everything so we had enough time to look at several different apartments at different places and to become acquainted with the environment.

Working at Boeing

Even being international trainees we are assigned as direct Boeing employees which means that we are also eligible for all Boeing benefits. Besides of work, Boeing provides an amazing amount of services, recreational opportunities and clubs. There are myriads of different kinds of clubs and interest groups which include all kinds of different sports but also issues like astronomy, arts, a hellenic society or the wine and beer makers, to mention just a few. At the Everett site there is a gym with softball fields and many coworkers of mine went there during lunch break for exercising (not me, I'm too lazy!). The most amazing and impressive thing to me is how Boeing fosters and animates their employees for further education. There is an incredible amount of off-hour courses in the fields of engineering, business, software engineering, computer languages and personality development offered by Boeing. These courses take mostly place in the Boeing facilities in Renton, just a few in Everett, and they are about 3 hours once or twice a week for 3 months. Every quarter, the Boeing Learning Centers release a newspaper with all the courses offered. Kai and me took immediately this opportunity and we did the ground school for the Private Pilot license as an off-hour course and participated in an introduction to aeroelasticity. But that is not all, Boeing employees can take every course at universities and will be reimbursed for all expenses afterwards when they successfully pass the course. One can get a master degree or graduate to PhD for free. This outstanding and wide perspective support of education that I never experienced in companies before impressed me very much and I wish German companies would offer similar programs.

My assignment at Boeing was exclusively within Liaison Engineering and associated with the Materials Review Board. I rotated through the following liaison groups:

- 1) Liaison Orientation, 4 weeks (Larry Surdyk), Everett
- 2) 747/767 Wing Responsibility Center, 7 weeks (Mark Kilpatrick), Everett
- 3) Composites, 1 week (Colleen McClure), Auburn
- 4) Machine Shop, 1 week (Gary Ray), Auburn
- 5) Sheet Metal, 1 week (Eric Hamada), Auburn
- 6) 767 Body Structures, 3 weeks (Al Richardson), Everett
- 7) 747 Final Assembly, 5 weeks (Larry Surdyk), Everett
- 8) 747/767/777 Flightline, 7 weeks (Don Eardley/Mark Edwards), Everett
- 9) Supplier Liaison, 2 weeks (Hugh Kishi), Everett

The first question that raised when I was informed about my schedule for the next half year was what is actually Liaison Engineering? Generally speaking, Liaison Engineering is the interface between aircraft design and manufacturing, in other words liaison represents the link between theory and reality or fills the gap between the as designed and as built configuration of the aircraft, specifically. Liaison Engineering is integrated into Airplane Structures and its responsibilities comprise the representation of engineering on the Materials Review Board (MRB), Participation with other organizations for troubleshooting and resolving problems, authorization of substitutions and optional designs, initiation of changes to engineering documents and design, and the support of manufacturing, project and design organizations. Hence the role of liaison engineers is a combination of production, design and MRB engineering. The Materials Review Board is formed to comply with the Federal Aviation Regulations (FARs) in conjunction with the production certificate issued by the FAA for certified airplanes which authorizes the manufacturer to produce a reasonable amount of duplicates of airplanes that holds the type certificate. Dealing with complex systems like aircrafts, non-conformance items are inherently combined with designing, building and integrating all the different systems into the aircraft due to the high amount of people involved from different organizations and professions. As the type certificate of an aircraft is issued for a specified configuration reflected by the engineering drawings, each deviation from this

configuration and from the drawing, respectively entails a new certification by FAA. Many non-conformant issues lead to a drawing deviation by introducing shims or additional straps for example. Consequently, the as built aircraft configuration would have to be certified by FAA again which is combined with high cost and is time-consuming. To simplify aircraft manufacturing under reasonable costs though maintaining a high safety standard, the FAA set up regulations that allows the airplane manufacturer to deviate to a certain extend from the as designed and as certified configuration under certain circumstances as under the presence of an instance which ensures that the deviated configuration meets the requirements of the FAA (in particular FAR 25 and FAR 21) like the Materials Review Board. Incorporated in the FAR 21 (Certification procedures for products and parts) the FAA regulates the establishment of a Materials Review System by aircraft manufacturing companies as a production inspection system without being specific about the required structure of this system. These companies form a Materials Review System which has to be approved by FAA prior to its implementation whereby every alteration to the certified system has to be separately approved by the FAA. The Materials Review Board consists of QA (Quality Assurance) and engineering representatives provided by Liaison Engineering. The engineering part of MRB holds the following responsibilities:

- Determination of non-conforming material being acceptable without rework/repair or declaration of conforming material being structurally and functionally unsatisfactory
- Analyzing design data for troubleshooting
- Define and design rework/repair
- Extend rework to upstream or downstream aircrafts
- Certifies the as built configuration of the aircraft
- Insures design intent is met
- Support production, project and design

The conduction of the responsibilities of MRB-engineers are regulated and defined in Boeing Documents and is governed by procedures. When QA discovers a non-conformance with the as designed configuration (per drawing) on an airplane in production, the MRB-process is initiated by raising non-conformance documents in form of Rejection Tags, Standard Repair documents, Non-conformance Records

or Pickups. The MRB-engineer investigates the problem and designs/determines the rework/repair whereas the rework assessment is influenced by ultimate strength, durability, damage tolerance, future repair, corrosion protection, functionality and maintenance criteria. If required, the MRB-engineer has to coordinate with the D.E.R. (Designated engineering representative, an engineer who represents the FAA) as in the case of major non-conformant item that affect safety, customer representative or project. After the disposition of the rework/repair the MRB-engineer has to sign the document which confirms that the repair/rework meets all the requirements of FAR 21 and FAR 25 and that the disposition is producible. The full responsibility for the disposition is held by the signing MRB-engineer.

As a greenhorn-engineer like me the path until one gets the MRB-authority is long and stony. Besides of the participation in several courses and seminars, one has to go through an on-the-job-training for at least 1 year per FAR requirement until one is awarded with the MRB-authority after an audit. Unfortunately, the 7 months are too short for me to get the MRB-authority which would have been a nice ending of this trainee program.

My first day at Liaison Engineering started with meeting Larry, my first supervisor, in the lobby of the so called Twin Tower Building in Everett. After a tour through the Everett facility and the factory he introduced me to the group and I had severe problems to memorize all the new names. I was located in the factory right by the final assembly line of the 747 and I was walking through the factory with the glancing eyes of a little child like seeing an aircraft for the first time. All these new aircraft and parts, a landing gear for the 777 here, a fuselage section of a 767 there, parts all over the place, I still couldn't believe being here at Boeing in Seattle, it was like in a dream. If anybody had told me to be here a couple of years ago, I simply would have laughed at him, but now it's true.

The first couple of weeks, I spend my time by getting acquainted with all the Boeing standards and procedures. During this periods I discovered two things, one was seemingly a completely new language which is used in the standards and the second was an allergy against acronyms. Fortunately, there is that web page on the Boeing web with an acro-

nym search machine but what a help when you get about 30 meanings for most of the acronyms! While I felt like in a dark room concerning the whole Liaison system at the beginning of my assignment, that room started to light up little by little during the subsequent days. First, a faint pale spot in one corner in the room, then in the other and slowly but surely the spots started to grow and coalesce, some weak contours became visible and finally, that room turned into bright light.

After this introduction I went to MRB in the 747/767 Wing Responsibility Center where I started to work on elementary non-conformant items under supervision like misdrilled holes, toolmarks, gouges and simple riding conditions. New group, new names. The same problem repeated every time when I went to a new group! Throughout the rest of my assignment I stayed and will stay within the MRB and in the course of time in other groups I started to work on more complex items like gaps, interference problems, dents and discrepancies that involved repair angles and doublers until I reached a stage where I simply went to the QA booth and grapped a tag to work on it. As I don't have MRB-authority the problems I worked on were reviewed by a MRB-engineer and got the documentation like rejection tags finally signed off by this person. Particularly when doublers, structural shims and repair straps are introduced on primary structure it was quite often necessary to coordinate with stress liaison who support MRB in structural questions and have access to precise information about actual design loads and stress on the part or structure of interest.

By the end of June, I went to Auburn for 3 weeks where composite parts (engine cowls, fairings, leading edge wing panels, etc.), machined aluminum parts (wing spars, beams, etc.) and ducts (plastic and metal) are produced and assembled, respectively. I spent one week in each group which was just enough to get acquainted to the group and the surroundings so I just went out with other engineers to work on Rejection Tags which were mostly related to the dimensions of parts or non-conformant material properties. A very nice experience in Auburn was a softball game during the lunch break at which I attended. The different Liaison Engineering groups in Auburn organized an intern softball-league and each Wednesday one group plays against

another one during the lunch break. That was a real blast and I had lots of fun. In the middle of July I returned to Everett to the MRB of 767 Body Structures where during that time the first and second 767-400 (VQ001 and VQ002) went through the assembly line. I worked several tags at the 41, 43, 45, 46 and 48 Section on these aircraft and was again exclusively involved in structural items. Parallel to working in this group, I attended the "Structural Aspects of Aircraft Repair" course which was every morning for 4 weeks. Besides of that class I had the opportunity to participate also in an introduction to CATIA for Liaison Engineers class, an introduction to MRB seminar and an aerodynamics for Liaison engineers seminar. After 3 weeks working on 767 fuselage sections, I returned to 747 final assembly where I had started my assignment and I was working mostly at the 41 and 42 Sections of the 747 in the final body joint and installation within the MRB. Although the prime part of the non-conformant items were structural, I was also exposed to furnishing items. The interior of the aircraft are mainly buyer furnished equipment that means that the customer directly made contracts with furnishing equipment companies and bought their interior independently from Boeing at those companies that deliver their products to Boeing where it is installed in the aircraft. From the final assembly I went to the flightline MRB in Everett where the 747, 767 and 777 is supported. In this group the working profile changed considerably. Whereas I worked in the factory almost exclusively on structural items, at the flightline where I'm currently writing this report, I am also involved in functional test, airplane systems, avionics and aero-smoothness items. Time is much more an issue than in the factory as the aircrafts are quite often not available due to functional test, test flights and customer inspections. On the other hand, much time is consumed in the investigation process. For example one grabs a tag or a flight squawk on which a system related item like a functional test failure or a wrong EICAS message is addressed and one doesn't have any clue what might be wrong. So, the first thing to do is to find out what exactly went wrong and the best way to do it is talking to the initiator of the tag/flight squawk or anybody who was involved in it. After that, the actual investigation process starts with pulling up drawings in REDARS,

looking on functional schematics, wiring diagrams, functional test document and other references to get acquainted with the system. Usually additional consultation of project engineering persons are necessary for the sake of troubleshooting and it takes quite a bit of time to get the adequate person on the phone. Once the problem is resolved, one has to contact and coordinate with the persons who are involved in fixing the problem and sometimes coordination with and approval by the D.E.R. (Designated Engineering Representative) is required. During that process of troubleshooting and finding an adequate solution, one get paged several times by the QA lead or shop supervisor driven by the burden of test schedule and delivery date with the friendly inquiry how long that process might take until they can do the rework. The short time one has to work the problems and the huge variety of problems make the work really challenging. Working at flightline liaison is the best way to get to know the whole aircraft including the systems. Besides of that, one has to deal with a huge amount of different people like mechanics, shop supervisor, customer engineers, project engineers, supplier representatives and engineers, pilots and customer representatives. One has to adapt to different conversation styles and people from different cultures. That is a very valuable experience for me and I can't appreciate it high enough. It is amazing how many different people I met in such a short period of time. It was at the flightline where I faced VQ001 (767-400 flight test aircraft), which is also known as "flying brewery" among the mechanics because of the water tanks in the passenger cabin for weight and balance control that look like beer barrels, and VQ002 again. After participating in the rollout ceremony from the factory I had the opportunity to witness the first flight of the 767-400 on October, 9. It is an indescribable feeling to watch a first flight having in mind that I worked also on this aircraft and contributed even though microscopically to the successful take-off. As the distance between the airplanes on the apron area and the building where flightline liaison is located is quite big, we have several bicycles in our office that we can take for biking out to the aircraft. When the sun is shining outside it is lovely to be at the flightline (we are equipped with safety sunglasses!) but I also experienced cold and pouring days when one gets totally wet before reaching even the first 100 yards!

Resume of my working experience at Boeing

Although I majored in aircraft design, aerodynamics, astrophysics and flight mechanics, my philosophy during studying was rather to broaden my knowledge by attending in many different lectures like in the additional fields of airline operation and politics, structural mechanics, control systems and aircraft engines than to deepen it as one will deepen in one field anyway when working. From that aspect this particular assignment in Liaison Engineering was the best thing that could happen to me. It enabled me to gain distinctive insight into the whole system aircraft from different points of view that have to be taken into account when assessing non-conformances and designing or planning the rework. Primarily one has to consider the structural aspects of the problem and reflect safety and functionality of the whole system when designing and planning the rework. Particularly during the final assembly of the aircraft one has to make sure the rework won't have an impact on parts in the vicinity or adjacent to the discrepancy which aren't installed at that stage. On the other hand, the manufacturing aspects have to be taken into account concerning the availability of material and parts, the tools required for the rework and the schedule of the shop and planners, respectively. For major non-conformances, FAA and FAA representatives like the D.E.R., respectively, are involved and safety is a prime issue. Last but not least there is also the customer who has to be satisfied when aircraft maintainability is affected or esthetical appearance is deteriorated. One has to answer the question by himself whether one would accept the rework and would buy it off if one is the customer who pay millions of dollars for the aircraft. Besides of that, the communication with the different people is a very valuable experience and that was great fun as the people here at Boeing are incredibly friendly and cooperative in a way I have never experienced in Germany yet. This fact makes communication very easy and effective. In addition, my time in Liaison Engineering helped me substantially to become more flexible and to increase my knowledge on aircraft. I have also got a tremendous insight into the "real" world of building airplanes and the problems shop encounters in trying to

achieve the drawing configuration when transferring the theoretical and unreal aircraft per drawing of design and project into a practical and real one with a more or less deviation from the first one.

Furthermore, I enjoyed it very much to be in direct contact with the airplanes and the process of assembly as I am a real airplane enthusiast. Another very important aspect of this trainee program is that I got to know and worked with so many great people here at Boeing. Every time when I had to change a group, I was a little bit sad because of the people, I met there and the great time, I had and that was repeating in each group I was in. I want to take the opportunity and thank all my supervisors, namely Larry Surdyk, Mark Kilpatrick, Colleen McClure, Gary Ray, Eric Hamada, Al Richardson, Mark Edwards, Don Eardley, Hugh Kishi and the chief engineer of Liaison in Everett Doug Serrill, and everybody I worked with for their great support (to name all would expand this report to a book!), for making my time at Boeing that unforgettable and the experiences I gathered that valuable. I appreciate especially the possibility for participating on many on-hour-classes. Furthermore, I want to thank Marianne Reichow, the good soul of the Lufthansa foundation, for her great and cordial support from Germany, and Michelle Colby, the good soul for all international trainees at Boeing.

New to this round of German trainees was the allotment of a mentor to each of us who supported us at work and off the job. My mentor, Vera Martinovich, works at the aerodynamics organization and she took me to a lot of seminars within Boeing. Besides of that, she was a great help for getting acquainted with the area and all kind of hints. I also want to thank her very much for her great support.

Seattle and Surrounding

The Puget Sound area with the adjacent Cascades is a great area to live; on the west side water and on the east side the mountains, a perfect combination. There are so many nice places to go that even without working these 6 month wouldn't have been enough to see everything. In this area are so many and diverse scenic attractions I never have experienced before. Rainforests, the dry and steppes-like landscape of Eastern Washington, the islands in Puget Sound, Mount Rainier, Mount St. Helens and the romantic hiking trails all over the

places that invite to philosophize and muse are a revelation of nature that give this place its high worthiness. Nearly every kind of sports and outdoor activity is possible due to this special location. Even during the summer, many coworkers went out for skiing at the weekends (if they didn't have to work!). Because of this great diversity of possible off-work activities (off-hour-courses and private pilot license included) one has to find the best compromise in planning the time. Kai and me decided even before we arrived here to take flight lessons which is very time- and money consuming, so most of the weekends were gone because of flying, particularly as we experienced the worst summer many people remembered here so far. Although flying consumes lots of money and time, the view of those very nice landscapes from above and flying in principle more than compensates for that. After 40 hours of work and getting up very early, several off-hour-classes after work that I took together with Kai and flying whenever time and weather permitted I needed quite often the whole weekend for regeneration, especially after that long illness. But nevertheless, we got around quite a bit, especially, when all the visitors of Kai and me were here for vacation. Our Apartment is in the meanwhile also known as "Kai's and Dirk's Inn". Once a week, I went to a sauna in the recreation center of Lynnwood to facilitate the regeneration process and a coworker from my time in Auburn integrated me into a soccer team where we had one game per week. I also went out with coworkers quite often, one took me to play golf once, with another one I went to Mount Rainier for hiking and occasionally, Kai and me were invited somewhere for dinner. Altogether, one thing is for sure, to say goodbye from this nice area and from the great people I have met here will be very difficult for me. Thank you all very much.

The third RASf crew's report, from the Sandra Hirche perspective:

When I first noticed the placard of the Reinhard-Abraham-Studienfoerderung (RASf) on the blackboard at the institute for aeronautical engineering, I just thought: "wow, what a great opportunity for the fortunate person who can be accepted into this program, working for Boeing and being in the U.S. for 6 months!" The second time I passed the

blackboard my only thought was "Why not me? If I don't try, I'll never know." So, the decision to try was made. After I received confirmation of an interview with Lufthansa and Ron Bengelink from The Boeing Company, I made my first jump of joy, but when I got the "YES, you've been chosen to take part in the program" letter I was mad with joy. I jumped on my bike, riding through Berlin singing Gershwin's "I like to be in America..." in a slightly modified version as loud as I could, with the biggest smile ever. The time from that moment to day "0" (departure day) passed pretty fast. In the meantime the other RASf students and myself were invited to Lufthansa in Hamburg. This gave me the chance to meet the people who developed and granted this great opportunity as well as the other two candidates Kai Singh and Dirk Krappel. We had a good time there, especially, of course, in the hangars, where we got a tour by Marianne and Michael. In the time following Marianne turned out to be a really helpful source back in Germany, which I cannot appreciate enough. The last 2 weeks prior to day "0" then became really busy since the papers from Boeing necessary for our application for the visa arrived late (1 week before our intended day of leaving). Well, how do you convince people at the embassy whom you cannot even talk to personally that your request is more urgent than all other which claim to be urgent as well? You don't, so we had to delay our day "0" for another week. At the last second we finally had all our papers together and could take off for one of the most important experiences of my life as it turned out later. But hanging above the clouds I was mainly curious without any expectations. I was wondering how the "magic" of this country will appear from my perspective, what is true of all the magnifications and prejudices...? But all this was still like a dream to me until the first glance at the Rocky Mountains brought me closer to the reality of it all and then I really became excited! In fact we already used the advantage of our coming position as Boeing trainees, sent by Lufthansa, to ask for having a look at the Lufthansa 747-300 cockpit. The Lufthansa Captain very nicely answered every question.

Day "0+":

When Michelle, our Human Resource Manager at The Boeing Company, and Jens Steinhagen (another German trainee who arrived 3 weeks before) picked us up at the airport I was

tired from the long flight. Due to this fact and me not being used to American pronunciation I only understood about half of what she was telling us, figuring that this is probably important and she'd hopefully repeat it later. This was not my only experience in misunderstanding; Once calling for an advertised car, the lady on the other side just said: "Hang on, please" and in a reflex move I hung up. "That makes no sense", I thought by me repeating her words to Kai and Dirk. They burst out laughing. Lesson learned! From my first impression of driving from Sea-Tac Airport to our hotel in Renton in the south Seattle, this place consisted of cars and highways only, and from the first glance I honestly didn't know I'd survive here for 6 months. This all changed of course after the first view of downtown Seattle and the majestic Mount Rainier as the beautiful backdrop for the Seattle area.

The following two weeks were busy in doing all the customary paperwork at Boeing, finding a place to live and finding a reliable car. This subject of a "reliable car" is very sensitive and I'll spend an extra chapter on that since this was definitely one of the major issues for me. So to say a whole part of my life here was wrapped in car stories could be said and it would be true!

I can only admire the first RASf crew, which arrived here and started working the very next day. For the three of us in the third crew it was a lot easier: We got one week to find everything before starting to work and additionally we could take the advantage out of the 3-weeks-ahead-experience of Jens, the help of Michelle and the recommendations from the last crew. For me, I spent a lot of time searching for an apartment house made of stone, as I am accustomed to that in Berlin. These wooden houses were really different for me and took some getting accustomed to. But after looking at a lot of places I gave up the idea to find one made of stone. We all ended up settled in the Northgate area in one of the oldest apartment complexes in Seattle (from 1947!) and close to the Northgate Mall which is one of the oldest shopping malls of the Northwest. This location as it turned out was the best compromise for reporting to both the Boeing Everett office facility north of Seattle and the Boeing lab facility which is south of Seattle. However, I would not really recommend moving into this

exact area though since the crime rate here is higher than in other places (4 weeks after arriving two people were shot at the mall and several other incidents indicated that going out here alone at night time wasn't the best idea). Michelle helped out a lot in getting all the small things, which you lack when you move somewhere and basically have nothing, for this I am thankful.

Working at Boeing:

At my first day at The Boeing Company I was really excited. I didn't know whether I would fulfill the expectations, whether my university knowledge would satisfy the requirements, whether my English would be enough, whether I would get along with the people, and all these other concerns you think of when you enter not only a new country, but a new place of working as well. So when my Supervisor "Ralph" received me, I was a little nervous. I really had not expected such a cool supervisor and such a fun group to work in, but that's exactly what I found. The first thing to notice here was the difference from my experiences with German working atmosphere, that everything looks much more open, more communicative and you never get the impression that there is some kind of a distance between you and for instance your supervisor. That makes the atmosphere really enjoyable and productive from my perspective.

I was assigned to the Flight Management Computer (FMC), navigation and guidance functions organization. Here the system requirements for the FMC software and hardware of all Boeing airframe types are defined, documented, tested and certified. The software delivered by the supplier is tested at the simulation test benches in the Integrated Airplane Systems Laboratory (IASL) for functionality. When problems are identified there is a problem reporting system that allows communication to the supplier as well as follow-up telecons to discuss the fix criteria. Besides that the group is responsible for answering all FMC related questions from Service Engineering and troubleshooting for the airlines. During the period of time I was there, several "red label" progressive versions of the software update for the 767-400 were tested, leading to a successful first flight on October 9, 1999 without any problems related to the flight management computer and thrust management computer at all. At the roll-out ceremony on August 18, 1999 that had preceded the first flight I had

imagined how the people must feel who worked on that airplane from the beginning on and what an incredibly great feeling that must be to see your "little baby" taking off. Even for me it was an impressive feeling since I worked on some of the testing for this FMC. Most of my time was spent working in the same group, FMC navigation and guidance. Since the staffing situation at Boeing was quite problematic with a lot of layoffs during my time, I was not able to switch to different groups like a RASf student may normally do to get a bigger view of the whole company.

What did I do here? It took some time to understand, because the FMC is one of the most complex systems on an airplane. It is complex enough that many experienced engineers agree that no one person can know everything about the FMC, which can seem somewhat overwhelming. For the first three months I got an interesting project to work on which was perfectly designed to get an introduction in all models of Boeing airplanes FMC's. That is, I developed a procedure for a non-precision approach using the VNAV function for all models of Boeing airplanes. This was quite a challenge. It required the analysis of the VNAV function and the differences on several FMC's, the analysis of existing procedures of the airplane from several airlines, the analysis of the common Boeing non-precision approach procedures, and the analysis of the approach requirements. To validate the procedure we had to fly it several times in the simulator and the test benches. To be honest, that seemed more like fun than work to me.... I really enjoyed it! Later I had to present this procedure to my lead engineers and supervisor, before it got passed into the technical review of the flight crew operations group, which is still being conducted in conjunction with the Boeing Flight Test pilots. Boeing has 80,000 plus employees (regarding the Seattle area only), which makes it a really big place to work. And, while Boeing culture is changing, just like in all big organizations it is a challenge to work fast and efficient, so there will probably always be some potential to improve, just based on the enormous size and complexity of the product and how safely and reliably it is expected to perform.

In the last three months I got the chance to join the testing of the software for the 767-400. The most exciting thing about that is

watching a product grow, working on a small component of it and when it gets assembled together seeing it working with all the interfaces to the other components. Besides software testing I worked on telexes which are problem reports sent by airlines. This ended up in explaining functions and the behavior of the FMC or trying to find hidden software bugs through analysis and re-creating the scenario at the lab.

The system test benches roughly consist of a flight deck with all the necessary functions for FMC testing, with real FMC's, Multipurpose Control Display Units (MCDU's), Mode Control Panel (MCP), Electronic Flight Instrument Control Panels (EFIS CP's), Source Select Switches, Flight Displays and Autopilot Flight Director Flight Control Computers (FCCs). Several airplane systems functions that aren't feasible to have in "real" form at the systems bench are represented by a software simulation that is very sophisticated, ARINC transmitter/receiver signals and analog and digital signals/discretes. Combined, the equipment and simulation represent an entire airplane, able to be flown and monitored through an entire flight cycle.

The last task I assisted in was the updating of the simulation of the FMC regarding the true air speed filter to prepare the development of an improved true airspeed filter.

What else did I learn? Aside from the aforementioned technical knowledge I gained here it was a great chance to look into another country's business behavior and company philosophy. I learned to appreciate the open structure of the offices even if that took some getting used to. I experienced in real life the high importance of communication, especially when designing such a complex structure as an airplane. Finally, I enjoyed the non-authoritarian style of leading and the high emphasis on teamwork.

I have to thank a lot for all the support I got here from Boeing, starting with my HR manager Michelle, my mentor Nick to my helpful co-workers, especially Paul and Dave, who did everything for me to have the most enjoyable time. They were always helpful and gave good advice not only for...

...My cars:

I was smiling when I heard all the stories about having trouble with the car in the U.S. from the ex-RASf-trainees. So I have to admit: I was warned. I planned to do some travelling in this

area during the weekends, so I was really dependent on a reliable car. "The more money you spend initially", I thought, "the less problems you will have". I can tell now: "This equation is not necessarily true". So the first car I bought innocent enough at a Used-car dealer. It slowly showed a lot of signs of disintegration with every trip and whenever I was on the road, I was afraid of getting stuck somewhere in the boondocks, the American term for a remote area. I figured that the probability of the car to survive the 6 months I was to be in Seattle pretty low. To all the technically inclined of you: the engine had the wrong head so that the control system couldn't be mounted correctly, the starter died after two weeks, the 5th gear didn't work anymore, the throw-out bearing of the clutch was damaged. And some other unusual noises I do not even want to know the origin of... That was an American car, but with respect to the company I don't want to mention the brand. After 5 weeks I was able to convince the dealer to take it back, only of course, if I'd take a pricier one instead. After all the trouble with the first one, I was looking for a really reliable one. I therefore bought a small Japanese one (counting on the reputation of the Japanese cars) at the same dealership... what a mistake. This car turned out to be very hungry for oil. In fact it was losing oil and smoking... after some adventurous rides up and down the mountains nearby, the head gasket blew off, which made the car even pricier. I finally resorted for my weekend adventures to renting a car if it was a longer trip. My nerves were already blank after the first car; in between I have only a desperate smile for all this. At work and everywhere else there are jokes about cars, and me so when I get to work the first question isn't "How are you?" but "How is your car?" instead. No comment. Finally, my last car, loaned to me by a friend had no problems at all. In the end I can say: In this really expensive and nerve costing class about bad cars, I learned a lot, I'll never need help anymore at measuring the compression, changing fuel-, oil-, and air filters, making oil changes etc., I became really paranoid about strange noises in the car and I will never again trust an American car dealer or mechanic, at least not....

...around Seattle.

Seattle is an extremely fast growing city, you can expect to experience a traffic jam every

morning and afternoon while commuting to work. The distances between places here are incredible and surviving without a car is not even imaginable. An interesting point though is, that you get used to that and you don't even think of doing something or not because of a distance. A one-hour drive to get somewhere is nothing out of the ordinary.

Once I got around I found really nice places to hang out. Greenlake for instance is a great park with a lake and a trail around with lots of young people doing sports, it's perfect to run your rounds on inline skates in the afternoon, which I used to do for workout. Sports in general is really big in Seattle, it's hard to find a sport which you can't do here. Besides inline-skating, swimming in Lake Washington or just hanging out with some friends at Golden Garden I did a lot of windsurfing.

My co-workers tried to make my time as enjoyable as it could be not only at work, they cared even for my spare time. So I was invited several times for sailing on the Puget Sound and flying with one of my co-workers around the whole area down to the Oregon coast. At night Capitol Hill with its colorful nightlife turns into the place to be.

Talking about the weather is definitely a big deal in Seattle. Some people suspect that due to the bad weather Seattle has the highest suicide rate of the U.S.. In fact Honda even brought out a color "Seattle Silver." What is definitely true about Seattle's sky is that it has the most beautiful clouds ever seen. Though I can't complain: Since the weather here is really local phenomena, but you can always escape the bad weather by...

...Traveling:

Exploring the area from Vancouver, Canada to the San Juan Islands, to the Olympic Peninsula and Eastern Washington along the Cascade Mountains with its snow covered volcano peaks down to the Columbia River and the Oregon coast was the thing to do on the weekends. I have already seen a lot of scenery, but this one here is so impressive, you simply have to come here and experience that. The dense mixture of mountains, volcanoes, the sea, the lakes and the desert brings up a beautiful composition of scenery not only nice to look at, but providing you with all imaginable conditions of outdoor sports. The big thing for me here was definitely windsurfing. The Columbia River with its own thermal system is supposed to be the windiest area in the world,

you could call it "Windsurfer's Paradise". So the first three-month's weekends when my boyfriend was here were dedicated to traveling, hiking, and fishing. The rivers and lakes are rich in fish compared to Germany, so much so that I was on a three-month rainbow-trout diet. The last three-month's weekends were dedicated to all kinds of water sports like windsurfing, sailing in both a mono hull sailboat and Catamaran, wake boarding, and more. I really enjoyed every minute being here and my departure in October 1999 wasn't...

...The end of the story:

No, I definitely will come back, first for holidays next year and then...who knows? This experience has changed me a lot. I learned how important the "sich einlassen" on a foreign culture is to get integrated, to be part of this society. The cultural difference between the United States and Germany came already out every time I was standing in line at the cash register, when the cashier asked me where I come from, what I would do today or simply about the weather.... Being used to German rudeness and "non"-service I was sometimes really embarrassed by the friendly and helpful attitude of the people here. But for getting in contact with people you don't have to rely on the cashier in the supermarket, this is very easy here in general. Making true friends though is a whole other story.... Of course there is much more to say about the differences, but this is a lesson I learned, too: thinking in categories regarding different cultures is not helpful for integration at all. The best for me was forgetting all my German background and therefore any existing prejudices, trying to look at the development of American culture from the American's perspective, and then coming back to my German background. From this point you have not only a better understanding of the American culture, but also a completely different look at your own culture. Further I gained a lot of self-confidence since that was the first time I was that long in a foreign country and feel that I managed it pretty well. I know that where-ever I'll go I will have no problems to get integrated and whenever I come back I'll have some really good friends here. I can only recommend to everybody to come here or take any opportunity to experience the culture of a foreign country. I am so

thankful; no words can express the importance of my experiences and the gratitude I feel. Therefore I will support the RASf with all my power to give other students the opportunity to get into this fabulous program.

Summer 1999 Student Exchange Program: May to September

By Paige LeRose

I was, to say the least, very surprised and of course pleased to be the recipient of the RASf stipend. This was especially true since I had not even been accepted into graduate school at the time of being offered this unique opportunity to participate in a research project in Berlin. After recovering from my initial surprise, I gratefully accepted the chance to return to Germany. To clarify: I am in fact half German, my mother still lives there (yes, of course I visited her) and I went to high school there for 7 years prior to moving back to the US to attend college at the University of Washington in Seattle. Thanks to these earlier experiences, I speak fluent German, which greatly facilitated the whole situation.

Preparations for my departure were made quickly, since I only had six weeks to get everything in order, which included hiring and training someone to fill the job I was leaving. I counted myself rather lucky that I had that much time, as I was allowed to depart a month later than the usual schedule, due to late selection and notification. The people in Hamburg (Marianne Reichow, Juergen Kreth, and Dr. Dienger), Berlin (Prof. Schubert), and Prof. Dogan were enormously helpful during this hectic time, letting me know what to expect and making travel arrangements. When all was said and done, I was quite relieved to find myself on a plane to Berlin with nothing to worry about for a few days: I arrived right before May 1, a German holiday, so everything had to wait until the next week.

Upon my arrival, I was enthusiastically greeted by Frank Jacob, who escorted me to my domicile at the Internationales Studienzentrums Berlin (ISB), which is located at the Theodor-Heuss-Platz. Frank saw to it that I got into the room OK, that my finances were in order, and that I was fed. The first floor room was nice and large, with its own bathroom, a fridge, plenty of storage space, and a shared kitchen

on the second floor. Getting comfortable was no problem for me and Dusty, my faithful cat, who came along to keep me company. I also picked up my old bike from mom's that first weekend, and used it to get to the TU every day.

A few more quick words regarding the ISB: The people there were a neat crowd, and we had a lot of fun. For example soccer games, going out for dinner, and a 4th of July party are among the happy memories I've brought back.. It was just unfortunate that many of them left a month or so earlier than I did, when summer break began. (Not to mention that it didn't help to be missing my boyfriend something awful...) Also, the ISB offered talks by both residents and guest speakers on a variety of topics, a great way to spend an evening.

Once I had registered with the police – they do keep good track of inhabitants, which is a bit spooky – I made my way to the TU. There I was greeted in a most friendly manner by Immo Garrn, who was my partner in crime (um, research)/supervisor/buddy for the time of my stay. A friendly guy with a good sense of humor and great knowledge of how to get research-related stuff done, we got along fabulously. He introduced me to the department (people and machines), including Stephan Ruckmich, our benevolent research leader.

The first month was mainly spent with reading up on the topic I would be taking a closer look at: ceramics. I graduated as a chemical engineer, and did not have the specific ceramics processing background of a materials science major. Which didn't stop me from getting started on the experiments by the second week... Once I had figured out what was going on and formulated the scope of the research, I was able to proceed more quickly, as well as start work on the research report. Since I find ceramics extremely interesting, not to mention very important to technology (think capacitors, multi-layer chips, integrated circuit packaging, ultrasound devices), I've attached an excerpt from the background section of my research report at the end of this narrative. It gives a very brief outline of ceramic processing, which the reader will hopefully not find boring.

Since I was trying to save as much money as possible during my stay, I quickly determined where to get what for the best price, and found that it was possible to live quite comfortably on 450 DM per month for food & fun (provided one doesn't eat out every day). That didn't include the train trips I took to visit my mom and also to go to Prague with my boyfriend, who was kind enough to come "rescue me" at the end of my stay.

Another interesting experience was my first "real", i.e. officially recognized by a university, teaching assignment: The thermodynamics department at the TU had invited an American guest lecturer, and decided to hire some native (American) English speakers to teach a technical English course. This was a great experience, I made some extra money, and I can now really appreciate the work that goes into preparing a class – let me tell you, teaching is not as easy as it may seem...

In my spare time, I explored Berlin on bike and foot. However, most of my walking took place in the Grunewald, a large forest/park only ten walking minutes from the ISB. A refreshing and quiet place for walking, running or biking, I found it an ideal getaway from the heavy and hectic traffic in the city.

Well, with this, I will come to a close. There is much more to tell, and for anyone interested in hearing more, please feel free to e-mail me at leroase@u.washington.edu. In closing, I want to say that I had a great time in Berlin and would go again in a heartbeat. For any UW engineering student out there reading this, I'd recommend you apply – it's a worthwhile experience for both your resume and, more importantly, your life. My heartfelt thanks to all the people who make the RASf exchange possible.

Thanks to the Donators

Since the middle of 1996 until January 2000 a number of renowned companies as well as private persons helped to raise the capital assets of the RASf by donating the amount of about 1 Mio.DM. The above mentioned amount has been invested and the annual earnings will be used at full extent for the internship programs.

The donators are :

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The members of the Executive Board of the Foundation as well as the Committee of Trustees would like to express their gratitude and thank all donors.



Ekkehard Tschirner, Vice President Public Affairs Berlin and Dr. Gerwin Dienger, Advisor to the Executive Board of Lufthansa Technik AG Hamburg, the two members of the Board of Directors of the DLBS, are responsible for all matters concerning the Reinhardt Abraham Memorial Foundation.

Change in the Management of Deutsche Lufthansa Berlin-Stiftung

After more than six years working for the RASf Dipl.-Ing. Jürgen Kreth has taken a new assignment in the Product Management of the Lufthansa Technik Aircraft Overhaul and Modification Department.

His successor in the RASf will be Dipl.-Ing. Peter Struck who will take over the position of the Technical Director and Secretary of the RASf on January 1st, 2000.



Peter Struck is in the aviation business since his apprenticeship until now. Most of the time he worked in engineering departments under Reinhardt Abraham. In the following a brief description of his career:

- Apprentice as Precision Tool Maker
- Mechanic in the Electrical Instruments Shop
- Studies in aviation and car building
- Powerplant Systems Engineer
- Engineering Coordination Manager
- Manager Technical Documentation Department
- Manager Quality Management / Quality Assurance

In the different position he was also member of various international aviation organisations.

Peter Struck is looking forward to his new position with great enthusiasm and he intends to use his experience for the benefit of the Reinhardt Abraham Memorial Foundation.

Impressum

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