- **What is your job?**

I am an enroute controller. I work in one of the largest ACC Centers in Russia. It covers an area over 750.000 square kilometers. Our Controllers handle aircraft flying over Seas, mountains and plains. The Center has boundaries with several FIRs and **borders with five states**. The area under control has a lot of danger, restricted and prohibited zones, military and civil aerodromes.

Our facility is **responsible for upper airspace** and en-route stage of flight. En route controllers **accept traffic from** Approach or another Center (and **hand it over to** adjacent units). The airspace is split into sectors. Each sector is managed by two controllers. ACC controllers

- handle traffic cruising on airways
- give heading and level instructions for separation and collision avoidance
- help pilots avoid bad weather conditions and restrictions.

- **How do controllers provide safety? What procedures do they use?**
- **What procedures have you practiced?**
- **What procedures do controllers use at work?**

ATC is to provide necessary separation between aircraft, safe orderly and expeditious flow of traffic. Controllers ***apply (use) different procedures:*** speed regulation, level change, vectoring, orbiting, holding, off-set procedure.

- **What is the most difficult thing in controller's work?**

In my opinion, the most difficult thing in working as an ATC is a high level of responsibility. We are responsible for the safety of several thousand souls during the working shift and we have. The mistake of a controller may cost very much.

- **How do controllers usually prepare for work?**

Air traffic controllers work different hours because they ***work shifts***. There is a morning shift, daytime shift and night shift. After a cycle of shifts, controllers have three days off. Before the shifts, the ATC should sleep well so as not to feel tired at work and maintain concentration throughout the shift. Most controllers prefer a morning or day shift because night work is very tiring and bad for health. The working day is 8 hours long, but night shift is the longest, it lasts about (approximately) 11 hours. Night shifts can bring fatigue, stress and risk of errors. It takes one day to recover after night work.

- **Why is it necessary for controllers to keep fit?**

ATCs need to keep fit, because their health depends on it. No doubt, a person who would like to be an ATCO should have a good health. He must pass a lot of medical examinations. He gets the Medical Certificate which must be renewed every several years. If an air traffic controller has

got some problems with his health the Aero Medical Section decides whether Medical certificate should be issued or refused.

- **Are strict health requirements an advantage or a disadvantage for an ATC? Why?**

  both options can be:

+I know exactly my level of health and I will not worry about it.
- medical examinations take a very long time and the procedures are not very pleasant for me.

- **What are the main duties of an ATC?**

Air traffic controllers ***manage movement of traffic*** in the assigned sector. They provide safe, orderly and expeditious flow of traffic. The main task of ATC is to ***provide necessary separation between aircraft***, aircraft and vehicles, aircraft and obstacles.

Air traffic controllers

- keep radio contact with pilots
- coordinate arrivals and departures
- issue landing and take-off clearances
- monitor and direct traffic ***on the ground and in the air***
- give weather updates to pilots
- provide navigational assistance, if required
- alert all necessary units and services in case of emergency

- **What is special about the unit you work in?**
- **How large is the unit where you work?**

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- **What equipment do you use?**

Air traffic controllers in our ACC use up-to-date and reliable equipment and software. ATC working positions are ***equipped with large quality radar displays*** and voice communication control panel. On table we have keyboard and mouse. During the work we use personal headsets.

- **What can a controller do in case of an equipment failure?**

ATC working positions are duplicated to provide non-stop operations. Technical engineers (technicians, technical service) ***maintain ATC equipment*** and provide its proper work. Radar and radio operational status is regularly checked. In case of malfunction, technical staff ***repair (fix) faulty equipment*** and replace it. In such situations, controllers ***change to backup (auxiliary) systems*** and continue work.

- **How are computers used in air traffic control?**

Aviation environment becomes more dependent on computers and modern technology. In the event of random, unpredictable equipment failures, controllers experience difficulty in providing unrestricted service, especially in dense traffic areas. For this reason, the reliability of the systems, 24/7 operational service of computers and accurate work must be provided. ATC positions are duplicated to prevent interruptions in operations which is essential for flight safety. ATC equipment is maintained by technicians who ensure it works properly. The radar performance and radio operational status are regularly checked. In case of malfunctions technical staff is responsible for repairing faulty equipment and changing to backup systems for non-stop ATC service.

- **Do computers reduce controllers' workload? How?**

Yes. Nowadays air traffic controllers use sophisticated systems with up-to-date software to track location of aircraft and ensure safe operations at each stage of the flight. With the help of new technologies controllers deal with the demands of increased air traffic. State-of-the-art technologies provide a lot of operational benefits and can reduce the load on the controller. However, with so many lives at stake, air traffic control will always require humans to ensure that automated systems function properly.

- **Do you find computer systems at your working place reliable?**

ATC use sophisticated systems with up-to-date software and equipment, besides consoles are duplicated to provide non-stop operations. Technical engineers (technicians, technical service) ***maintain ATC equipment*** and provide its proper work. Radar and radio operational status is regularly checked. In case of malfunction, technical staff ***repair (fix) faulty equipment*** and replace it. In such situations, controllers ***change to backup (auxiliary) systems*** and continue work.

- **What should you do in case of a computer outage?**

In such situations, controllers ***change to backup (auxiliary) systems*** and continue work.

- **Do you think that computers will ever replace controllers? Why? / Why not?**

In my opinion in a few decades it will be possible, because the artificial intelligence industry is developing at a very high speed.

- **What do controllers do if they observe a potential conflict situation?**

Controller tries to solve the problem as soon as possible by issuing the necessary commands to the crew or an adjacent sector.

- **What equipment helps controllers prevent conflicts at work?**

Safety nets are used which serve as another pair of eyes. Completely independent of the controllers, ground-based safety nets use real-time surveillance data as well as auxiliary flight plan information. They integrate the information and assess the air situation in order to find or foresee potential conflicts that may occur. When such a situation is detected, it is indicated on the ATC display as a warning message.

There are normally four ground-based safety nets implemented for airborne phases of flight. For example: Short Term Conflict Alert, Area Proximity Warning, Minimum Safe Altitude Warning.

Safety nets are designed to reduce the risks and ensure flight safety. However, they may occasionally suffer false alerts and lead to distractions.

- **Why can a conflict situation occur?**

There are many reasons: high workload of the sector, non-standard situation distracting the ATCs attention, fatigue, equipment failures.

- **What situations may cause stress for controllers?**

ATC is a stressful job as controllers handle lives of many people at a time and there is no room for mistakes. Controllers can experience stress in case of high traffic intensity, hazardous weather conditions, unexpected or emergency situations. Nevertheless, controllers must stay calm, work quickly and efficiently under all circumstances.

- **How do controllers usually cope with stress, do you think? What do you do to cope with stress?**

Controllers must be able to cope with stress, have sufficient breaks during the work and good quality rest.

- **What skills do you need in emergency situations?**

Communication skills

Air traffic controllers must be able to give clear, concise instructions, listen carefully to pilot's requests, and respond by speaking clearly.

Concentration skills

Controllers must be able to concentrate in a room where multiple conversations occur at once. For example, in a large airport tower, several controllers may be speaking with several pilots at the same time.

Decision-making skills

Controllers must make quick decisions. For example, when a pilot requests a change of altitude or heading to avoid poor weather, the controller must respond quickly, so that the plane can operate safely.

Math skills

Controllers must be able to do arithmetic accurately and quickly. They often need to compute speed, time, and distance problems, and recommend heading and altitude changes.

Organizational skills

Controllers must be able to coordinate the actions of multiple flights. Controllers need to be able to prioritize tasks, as they may be required to guide several aircraft simultaneously.

Problem-solving skills

Controllers must be able to understand complex situations, such as the impact of changing weather patterns on a plane's flight path. Controllers must be able to review important information and provide pilots with an appropriate solution.

- **Why did you decide to be an air traffic controller? Do you regret this decision? Why?/Why not?**
- **Where did you study to become an air traffic controller? How long did it take you?**
- **What basic aviation disciplines did you study there?**

I decided to be an ATC because my previous specialty was flight attendant. But over time, I wanted to find something more serious and related to aviation. I was thinking about becoming a civil aviation pilot, but pilots have stricter health requirements. I find my job very interesting and important. I like it very much and I'm happy to have it.

I graduated from St. Petersburg State University of Civil Aviation in 2017. I studied for a year and a half. My initial training included study subjects like navigation, aerodynamics, meteorology radiotelephony phraseology and simulator training. In 2018, I passed psychological and medical tests, then I was completed on-the-job training and in August of the same year received an ATC license. I am rated to work as an en-route controller.

- **Why do air traffic controllers continue training throughout their career?**

Once qualified, all air traffic controllers are required to keep their knowledge and skills up to date. This means controllers continue training throughout their career. They have refresher courses, simulator training, and different tests and exams on a regular basis.

- **What training do you have on a regular basis?**

Controllers are always learning, they have regular training in the classroom and on the simulator. The training is focused on international and local regulations, routine and emergency situations.

- **What skills are developed during the simulator training?**

Communication skills

Concentration skills

Decision-making skills

Math skills

Organizational skills

Problem-solving skills

Stress resistance skills

- **What are the language requirements for air traffic controllers?**

Air traffic controllers are required to have an appropriate language competence, have regular training in radio phraseology and aviation English. Every controller gets tested on English as a part of the licence requirement. The language proficiency test is taken at least once in three years to prove the operational level of English.

- **What skills do controllers need to pass the English test at ICAO level 4?**

During the test the listening and speaking skills (comprehension and interaction) along with pronunciation, grammar, vocabulary and fluency are assessed.

- **What is the difference between standard phraseology and plain English?**

Standard phraseology is used in all routine situations ***for safe, quick and effective communication***. Standard phraseology helps avoid any misunderstanding or confusion because every word hatrs one meaning and goes with exact procedures. However, phraseology cannot cover all the situations possible. Pilots and controllers ***speak plain English*** when phraseology is not enough (or not available). It helps ***check, clarify or specify information***. Plain English is necessary to communicate successfully, that is to ***identify, explain and solve problems*** in non-routine situations. If plain English is used, it must be simple, easy to understand, clear and unambiguous.

- **Is English an advantage or a disadvantage in the controllers' job? Why?**
- **How can misunderstanding between a pilot and a controller affect flight safety?**

A lack of English, heavy accent, incorrect use of phraseology, unnecessary English words, too fluent English, too long and complex instructions can ***cause misunderstanding*** between a pilot and air traffic controller. Misunderstanding is very dangerous in aviation because it can lead to fatal errors (mistakes). To prevent it, pilots and controllers must speak clearly, slowly and distinctly, if necessary, they must be able to ***rephrase (paraphrase) the message***.

- **What problems may occur if two aircraft have similar call signs?**

The danger of a pilot taking and acting on a clearance intended for another aircraft due to this phenomenon is a common occurrence and can lead to flight safety incidents.

- **What may happen if two pilots start transmitting simultaneously?**

If two pilots talk on the same frequency at the same time, it cancels out and makes an unpleasant noise on frequency - no one hears the message. At that point someone's going to have to try again.

- **Do you ever have problems understanding foreign pilots?**

Sometimes. Due to poor communication quality. Problems with understanding foreign pilots may arise due to a specific accent (crews from the East), when using non-standard words or jargon.

- **What rules of communication are used both by controllers and pilots?**

Pilots and controllers must speak clearly, slowly and distinctly, if necessary, they must be able to ***rephrase (paraphrase) the message***.

- **What ATC instructions must be read back by pilots? Why?**

Pilots should read back those parts of ATC clearances and instructions containing digits, altitude assignments, vectors, or runway assignments.

- **What helps you to maintain the necessary level of English proficiency?**

Pilots and controllers are trained and tested on a regular basis (they learn English and take English tests regularly) to maintain the ***language proficiency***.

- **How do your authorities arrange controllers' learning English?**

Every year and a half, ATCs takes advanced training courses in aviation English. In addition, after the morning and before the day shift, controllers can improve their communication and understanding skills in English lessons in the classroom on the 2nd floor.

- **What do you do when you don't understand a pilot?**

In this case, the controllers asks to rephrase the question using other words. Or to spell it if it concerns the points on the way/

- **What procedures do controllers use at work?**

Controllers ***apply (use) different procedures:*** speed regulation, level change, vectoring, orbiting, holding, off-set procedure.

- **What is the most difficult procedure for you?**

It's difficult to say. Because I'm an en-route controller and I use all these procedures except holding and orbiting.

- **What do you do to ensure appropriate separation between aircraft?**

I analyze the air situation, give the crews the necessary instructions, use different procedures such as: speed regulation, level change, vectoring, orbiting, holding, off-set procedure.

- **Tell me about your typical working day.**

An average or typical shift starts with a ***medical check***. Next step is the ***briefing***, we obtain information about weather, restrictions – anything that can affect our operations. After that, we ***take over*** duties from the previous watch. We check for any updates in the sector. We ***work*** on radar for about 60-90 minutes before a short ***break*** to decompress after a busy radar session. The shift typically ends with the ***de-briefing***.

- **Why is a medical check necessary before every shift?**

Medical check is necessary because any ***health disorder*** (problem) can slow down reaction and reduce attention and concentration, which can lead to operational errors.

- **How should you organize your time to be fit for work?**

I have to get a good night's sleep before my shift and then everything will be fine.

- **How do briefings prepare controllers for the shift?**
- **What information do you get at briefings?**
- **What information from briefings do you find the most important for work?**

Controllers obtain information about traffic situation, actual and forecast weather, restrictions and operational status of equipment and navaids. The supervisor ***conducts the briefing*** and assigns controllers to different sectors (positions).

As for me, the most important information are: the number of planes, VIP flights, restrictions and dangerous weather conditions.

- **What shifts do controllers have?**
- **What is your favorite shift? Why?**

Air traffic controllers work different hours because they ***work shifts***. There is a morning shift, daytime shift and night shift. After a cycle of shifts, controllers have three days off. I prefer a morning or day shift because night work is very tiring and bad for health.

- **What are the advantages (or disadvantages) of working a day / night / morning shift?**

After the morning shift and before the day shift, I have a lot of free time, but there is very heavy traffic at work. Night shift is the longest, it lasts about (approximately) 11 hours. Night shifts can bring fatigue, stress and risk of errors. It takes one day to recover after night work.

- **Is your schedule convenient? Why?/Why not?**

My shift pattern is very convenient. I have a good work life balance. My working hours absolutely suit me.

- **How does flight intensity change from shift to shift?**

We have peaks and drops of traffic in our area. The traffic intensity changes from shift to shift. We have peak or rush hours in the morning. At times traffic can be very 'peaky'. At night traffic can be really slow or light.

- **How is a shift handover usually organized?**

ATCs ***takes over control*** of the sector in Operations Room (Radar Room). During a handover procedure, a controller from a previous shift updates me on traffic in my sector, issued instructions about level change, restrictions, VIP flights, potential aircraft crossings, marginal weather (turbulence, wind, and icing) and our equipment capabilities. Hand-over is critical as it helps me to be fully aware of the traffic situation in my sector.

- **What additional questions may you ask your colleague during shift takeover?**

- **What is the role of good teamwork in air traffic control?**

It takes teamwork to direct the traffic from point A to B. Teamwork involves coordination with neighboring sectors, military units, and ground services. Each sector has a team of two controllers – a radar controller and a planner. Air traffic safety is our common responsibility. Controllers support each other to ensure flight safety. Two heads are better than one, so teamwork is critical.

- **How does your supervisor arrange the work during the shift?**

During the briefing the supervisor assigns controllers to different sectors (positions). He controls the work of ATCs. Helps in difficult situations. It is an important link in teamwork.

- **What kind of assistance can controllers provide to each other?**

It takes teamwork to direct the traffic from point A to B. Teamwork involves coordination with neighboring sectors, military units, and ground services. Each sector has a team of two controllers – a radar controller and a planner. Controllers support each other to ensure flight safety. Reminders and warnings are used.

- **What units and services do you normally coordinate with?**

We are in constant coordination with meteorological services, with the air defense sector, with the military sector, with the approach and tower units, with adjacent States and sectors, with technical support services, with the planning service, with radio communications support services.

- **How does the air traffic service cooperate with the military unit?**

Sometimes we need to re-route civil traffic when military activities or restrictions are in progress. So we initially coordinate with military unit and only then we clear the crew a new route.

- **What situations / actions need coordination with the military?**

There are avoiding thunderstorms through the areas of responsibility of military sectors, emergency situations, crossing the FLs assigned to the military sector, for example.

- **What difficulties may you face due to military traffic?**

Military operations in the area may ***cause some difficulties***. Military operations are activities such as military training flights, test flights or shooting. Militaries can ***impose temporary constraints (restrictions)***, they can ***block (close) some airspace***, levels and airways.

- **What role do aviation documents play in your work?**

We use different kinds of aviation documents in our job, they are: the Air Law, Federal and local rules and regulations, orders, instructions, demands or recommendations. They play a great role in our activities: they regulate our work and rest hours. Besides, all controllers' standard and emergency procedures are published in documents and we must strictly follow them.

- **How do they help in your work?**

Controllers must strictly follow aviation documents. It's very convenient, because we have step- by- step description of our actions for this or that/another situation, we know when and what to do. Of course, it's very convenient and makes our job easier.

- **What documents have a higher priority: the ICAO or the local ones?**

As our country is a member of this aviation organization together with the local documents controllers use ICAO papers too. Moreover/indeed our local documents are based on them and very close to them. But still we can find (there are) differences in some items/aspects of the rules. Our local documents have priority over the ICAO ones as they are published in accordance with specific features of our zone.

- **How do you control air traffic?**
- **What do you do to ensure appropriate separation between aircraft?**

As an area controller, I have to provide or ensure safe and orderly flow of traffic by applying separation rules. I scan and analyze the traffic situation in the sector to detect potential crossings. I give pilots instructions to climb, descend or turn. I update pilots on changing weather conditions and restrictions on route.

- **Do you ever have traffic congestion on your area of responsibility? What may be the reasons for traffic congestion?**

Another problem which can occur is intensive traffic. There are peak hours (rush hours) when traffic volume is high (intensive traffic). Besides, some hot spots in the area pose a problem for ATC operations (e.g. intersection of several airways). It can increase ATC workload, strain and pressure significantly. In case of traffic congestion controllers have to adjust speed, change flight level, direct aircraft to the holding pattern. It can result in delays.

- **Why do you need a flight plan for each aircraft?**

All the necessary flight data are included (can be found) in the flight plans. There are call-sign, the Squawk, a cruising FL, points, the destination, alternates, number of permit, RVSM, additional information and so on.

- **What problems with a flight plan may occur from time to time?**

From time to time, controllers encounter with flight plan problems. It can be an outdated plan, a plan with incorrect information, an empty plan, or a plan may not be in the system.

- **How do you usually solve problems associated with a flight plan?**

If I have problems with the flight plan, I contact the planning service and ask them to fix it.