A deep dive into Briefings

All about the what, when, how and why

Both in the day-to-day airline life and in general aviation, we use all sorts of briefings. This PTD Bulletin is meant to introduce you to the world of briefings, what their purpose is, which types we have and – most importantly - when and how to perform them. So let's get started right away!

Note: *For most of this Bulletin I'll be referencing how we do things at the airline I work at. Keep in mind that this is not the only way to do things, nor do I claim that it is necessarily the best, nor is all of it directly transferrable to general aviation. So, Take this document as a starting point for your own journey of developing how you perform briefings.*

1.   What is a briefing and why do we do them

A briefing is a tool meant to put all crew members on the same page for the upcoming operations. In today's multicrew airliners it is absolutely crucial that all crew members have the same idea of what you're about to do. In the airline world we call this a shared mental model. Such a shared mental model allows especially the pilot monitoring to effectively intervene if things aren't going as intended.

Briefings have an additional effect of making you think through the entire procedure ahead of time, forcing you to collect all necessary information to create a plan of action. That in turn prevents you scrambling for the ILS frequency when turning onto the intercept course because you forgot to set it during the approach preparation, as you'd notice that during the briefing.

This effect is also what makes briefings an effective error-prevention tool even in single pilot operations, as a way of checking your own preparations and making sure you have set up your plane correctly and collated all the info you need

2.   What is Threat and Error Management (TEM)

Briefings are intrinsically intertwined with the so-called TEM model. So, to facilitate the explanation of the various briefings we hold, I'll allow myself a quick detour to this Crew Resource Management technique.

The basic idea behind TEM is that if we can identify something undesired that might happen, we can develop a plan ahead of time and react swiftly and appropriately should it actually occur. These undesired things that might happen are called threats, and they can come from a wild variety of sources, such as the environment (think topography, the weather, other airspace users, ATC etc.) or the crew itself (think fatigue, inexperienced crew members, training, distractions etc.). You can find a (non-exhaustive!) list of possible threats in the appendix to this document.

Once such a threat is identified we try to find a mitigation to reduce the risk to an acceptable level. As an example, if we identify a temperature inversion during climb out as a threat, we might mitigate that by flying manually until through the inversion in order to be able to react quicker when the speed starts dropping as you enter the warmer, thus thinner air.

3. How do we hold briefings

In the past, briefings used to be monologues presented by the pilot flying, rattled of at the speed of a machine gun in order to fit all the legally required information into a briefing without wasting too much time. As you might be able to imagine, this wasn't all that effective in actually creating the shared mental model that we desire, and as a result the way we brief has changed significantly over the last decade or so.

Today, briefings are intended to be a dialogue between all crew members, with everyone sharing their experience to get the most complete picture of the situation possible. The focus lies on the threats identified during the individual preparation, while the ordinary takes a step back and can be dealt with by just mentioning the key points.

As such, briefings vary significantly with the circumstances. While a briefing for an approach into your home base with perfect flying weather might take a minute at most, a briefing into a complex airport with technical limitations, poor ATC and miserable weather might be a slightly longer affair as we try to develop a plan that brings the total risk of the operation to a level that we can accept.

A long briefing is not necessarily a good briefing! Try to reduce the information presented to the parts that are relevant and out of the ordinary!

4. What kind of briefings do we have

During a typical working day, we hold several types of briefings. I'll briefly present each of them to you, listing their key points. In the Appendix you can find examples of each of the briefings following a fictional flight from Zürich to Lisbon to get a better understanding of the briefing processes.

4. A. Preflight Briefing

Before starting a working day, we'll get together in the flight deck crew and discuss in broad strokes the entire day. We use various documents to prepare for the briefing such as charts and NOTAMs as well as METARs and TAFs for all relevant airports along the routes of the day, significant weather charts for the routes being flown and company specific documents outlining the operations at the departure and destination airports.

Figure 1: A Significant Weather Chart (SWC) used for the meteo briefing. (Source: WAFC London)

Our focus during the briefing then lies on threats identified during the individual preparation. That means that we focus on anything away from the normal while keeping a rather cursory overview of the areas where we expect normal operations. Threats identified from NOTAMs could include closed runways and taxiways, defective or disabled navaids or changed approach procedures, in the charts and company documents we might find unusual approach procedures or confusing taxi routings and with the weather data we could be talking about things such as thunderstorms, jet streams and their associated turbulence zones, fog, or precipitation at relevant airports.
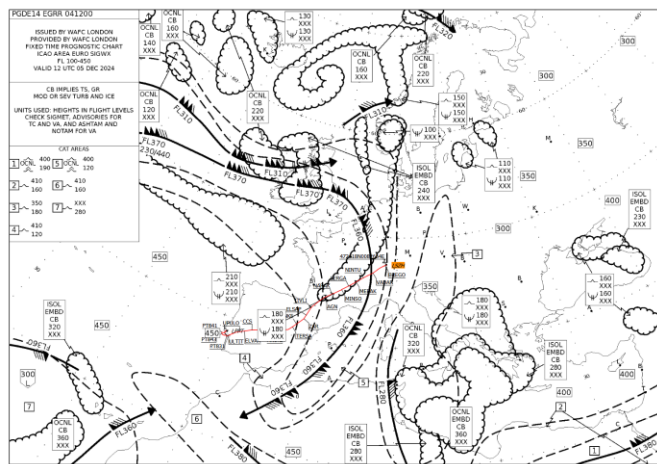
Considering all these threats and taking into consideration our experiences on the given route we then determine the required fuel for the initial leg and prepare the next briefing, the cabin crew briefing.

The pre-flight briefing is one that is very relevant to flightsim operations as well, you get an almost identical briefing package from Simbrief as we do from our dispatch tool and can make many of the same considerations to determine the amount of fuel to bring for any given flight, the finer points of fuel planning however are to be the topic of another bulletin.

4. B.   Cabin Briefing

As the cabin briefing is less relevant to flightsim operations I'll keep this one short; here we meet our cabin crew and inform them about the flights to be operated today from our perspective, usually offering calculated flight times and the weather along the routes, especially areas of known turbulence, while they might inform us about special passengers on board etc.

This is also an important tool for team building, as the cabin briefing is the first time we get to know our cabin crew, and getting a feel for the team dynamics and the specialties of each crew member can be crucial in an emergency situation.

4. C.   General Briefing

A so-called general briefing is to be held before the first leg of any (multi-day) trip and discusses how the cooperation between crew members is expected to happen. Here we also talk about the rejected takeoff procedure to refresh our knowledge of this important memory item.

We also talk about the main threats of the day, those tend to be the ones that stretch multiple flights, have a large area of effect or a strong impact on the planned operation, and we also already define mitigation strategies that we can apply when we encounter these threats.

4. D.   Departure and Take Off Briefing

During the departure briefing we talk about everything that should and should not happen between releasing the brakes for pushback until we transition into the cruise phase. Important points such as the expected taxi out procedure, take off runway, SID and initial cleared altitude are talked about, as well as safety related items such as the plan for an engine failure flight path should one of the engines quit at low level, the MSA in the areas we will operate in and a plan for an immediate return for extremely time critical emergencies (such as smoke or fire).

Then we assess whether there are any operational factors deviating from the norm, such as special local procedures, technical limitations and issues from the aircraft or meteorological concerns, before capping off the briefing with a summary of the identified threats and the mitigations to be applied.

4. E.   Cruise Briefing

In cruise we might also hold briefings, although these are not something that happens on every flight and are more of a tool to mitigate risks of special circumstances. Therefore, they also don't have a set structure and are much looser, tailored to the needs at hand.

As an example, we might hold a short cruise briefing before overflying high terrain, defining a point after which we no longer turn back but instead cross over the mountain range and descend to the other side should a failure occur that forces us to descend. We might also

discuss decompression strategies or weather phenomena expected to be encountered during the crossing.

4. F.   Arrival and Approach Briefing

Before starting our descent, we will collect all available information about our destination airport and compile them into a briefing focusing on the phase from top of descent until the shutdown of the engines. The structure follows closely the one from the departure and take off briefing and many elements will be mirrored.

Points to be discussed are for example the current clearance limit, the STAR with all its constraints, the MSA in the area, the type of approach and how it is flown, its key parameters such as the altitude where the intercept is expected to happen, the minimums and the initial missed approach altitude as well as the key points of the routings for the initial, intermediate, final and missed approach paths and their operational implications.

Furthermore, we discuss the landing, how it will be flown, what autobrake and reverse thrust setting we will use and where we plan to vacate the runway. That leads to the discussion of the taxi in procedure, focussing on hotspots as well as special local procedures such as APU regulations or standard taxi routings.

Once again, we assess operational factors deviating from the norm, special procedures to be applied and then summarize threats and their mitigations.

4. G.   Debriefing

At the end of the flight, we usually hold a short debriefing. The key idea here is to verify that we have identified all relevant threats and that the mitigations we applied ended up working out the way we intended them to. The debriefing also always includes a short discussion of the approach, as well as offering an opportunity to address anything that might have come up during the flight.

5.   Summary

As you can tell we hold many a briefing during a day (think of a day of flying with four challenging sectors and you can imagine that there would be a lot of talking in the flight deck) and that is for a good reason. Identifying and mitigating threats can significantly improve the overall safety of a flight, and establishing a shared mental model allows for an effective monitoring of each other's performance during the flight.

Think now about how you can implement some of these techniques into your flying on Vatsim. Of course, not everything will immediately transfer into the simulator, and it will feel awkward and difficult in the beginning, but practice makes perfect, and you can develop a powerful tool to improve your flying skills and to be ready for almost anything the day might throw at you.

Chiara Paganini

First Officer A220

Guest Author, Pilot Training Department

Annex A. Common Threats

Below you find a list of common threats that can serve as a guide when preparing your briefings. Note that the below list is not exhaustive and does not perfectly mirror all types of operations. Also consider that a similar list of possible mitigations cannot be provided as they need to be tailored to the specific operation at hand.

Airport	ATC	Aircraft	Environment
- Traffic Levels - Taxiway layout and hotspots - Infrastructure such as lighting or navaids	- Restrictions - Languages used on the radio - Use of non-standard phraseology - Short term clearance changes	- Technical defects - Challenging procedures	- Low visibility operations - Runway contamination - Noise sensitive areas
Weather	**Operations**	**Crew**	**Terrain**
- Reported or anticipated windshear - Thunderstorms and convective cells - Cold weather operations - Precipitation - Reliability of weather reports	- Time pressure	- Fatigue - Low experience with the specific operations to be conducted - Distractions - Training - Non-standard crew composition	- High terrain - Unfamiliar environment - Complex visual approaches

Annex B. Example Briefings

For these examples we'll be following a flight from Zürich to Lisbon. It would be helpful for you to have charts available to be able to follow along.

B.1.   Preflight Briefing

"Today we are operating flights ABC1230 and ABC1231 to Lisbon and back on HB-JXY, an A320ceo. The general weather situation is dominated by a Jetstream over central France leading to occasional severe turbulence for the first half of our flight to Lisbon and the second half on the way back. The local weather in Zürich is favourable, last patches of fog might still around but I expect them to have burned off by the time we depart. In Lisbon we expect a low ceiling but nothing too grave, and our alternate Faro is reporting CAVOK. Enroute I have looked at Toulouse, Barcelona and Madrid, all of which have sufficiently good weather should a diversion become necessary. There is an active SIGMET for Marseille FIR regarding the turbulence we have already identified on the significant weather chart, but else nothing interesting, and there are no volcanic ash advisories around. As for NOTAMs, the aircraft appears to be healthy, Zürich has the well known construction site on taxiway INNER, Lisbon has a couple of obstacles relevant for our departures and a closed taxiway, nothing interesting at our alternate Faro. As for fuel, considering the circumstances I'd like to bring the final reserve, a go around and 30min hold fuel in Lisbon resulting in a remaining fuel of 3.2t, plus taxi and trip of 6.4t, totalling up to 9.6t, which is 200kgs above the minimum required with alternate Faro. I'd like to add 200kgs on top as we might need to de-ice the aircraft and another 200kgs to be able to adjust our cruise level to get out of the worst turbulence for a block fuel of 10t flat."

B.2.   Cabin Briefing

"Hi all, we're going to be flying a Lisbon turnaround together today. Today we have HB-JXY, an old A320 parked on A17, it landed from Düsseldorf about 10min ago so it should be ready by the time we get there. We currently don't have a slot, however with de-icing there's always a possibility for some startup delays. As for the hard facts, we have a flight time of 2h30 on the way there and about 2h40 on the way back, this is due to a Jetstream overhead France. This also presents us for a chance of strong turbulence during the first half of the outbound flight and the second half of the return. Of course, we'll keep you in the loop regarding the turbulence with any updates we might get from other aircraft. That brings me to the most important topic for me, I appreciate good communication between the cabin and the flight deck; while the flight deck door might feel like an armoured barrier, please do not hesitate to come up or call us if you have anything you feel like we should know. Thank you, and we'll meet at 9 at the security checkpoint."

B.3.   General Briefing

"So, we've never flown together before I think. For me it is important that you point out everything that you think is weird, and intervene before things go pear shaped. In general, I stick to SOPs, if I deviate from them

for whatever reason I will clearly announce this ahead of time. As for OEBs we have the well known three, if you're comfortable then we don't have to talk through them anymore. I reject a takeoff below 100kts for anything including all master warnings and master cautions, after 100kts only for engine failure, engine fire, smoke, aircraft unable to fly or ATC call. Should we need to reject I'll call STOP, which automatically means "I have control", pull thrust levers to idle, then max reverse. Once stationary I announce "Cabin crew at stations" over the PA. You monitor deceleration, reverser status, autobrakes and spoiler and announce anything out of the ordinary, and please advise ATC when stationary. After that we stick our heads together and determine whether we taxi off the runway, get towed off the runway or run away from the runway. In the first two cases we perform the rejected take off checklist before any ECAM actions, in the last case we perform the emergency evacuation checklist. As for the threat of the day I mainly see the Jetstream with the associated turbulence, best mitigation I see would be to proactively ask ATC for turbulence reports to find a suitable level. Do you have anything to add or any specials from your side?"

B.4. Departure and Take Off Briefing

"We expect a VEBIT 4W departure out of runway 28, MSA is well known at home base, initially climbing to 5000ft with no speed restrictions Extra fuel and time at destination is expected to be about 200kgs with alternate Faro giving us about 5min while keeping the alternate or about 50min if we commit to Lisbon. Taxiout will be standard, inside or outside around terminal A to A2, in case of RTO we'll have about 30m of stop margin. In case of engine failure or performance related problems we follow the non-standard EFCOP, straight out to 2.3DME KLO, then left to intercept radial 252 KLO outbound to intercept radial 013 WIL outbound to GIPOL and hold. Acceleration at 3000ft, later climbing to 7000ft to hold at GIPOL where we can trouble shoot and prepare the approach, planning to return via ILS 16, ENUSO 4000ft, 180kts flaps 2 is the plan at ENUSO. In case of quick return initially we follow the same procedure until 4500ft, then turn right on heading 320 to position us for ILS 16. I don't see any special or non-standard operations and the aircraft is healthy. As for threats, the taxiways might be slippery with the low temperature, so we'll take it easy around corners and start braking well ahead of time. Do you have any other threats?"

B.5. Cruise Briefing

"We're now approaching the Pyrennees, minimum grid altitude is 14800ft in the area. Considering the tailwind and the weather in Toulouse I'd say until 5NM before TIVLI we turn around and fly north in case of any issues requiring an immediate descent, after that point we continue southbound. Our options for diversion are Toulouse, Montpellier and Perpignan on the north of the Pyrennees, Zaragoza, Barcelona and Bilbao in the south. For anything requiring an immediate landing Zaragoza and Perpignan are good options, for all less pressing issues I'd prefer Barcelona due to the weather and the facilities."

B.6.   Arrival and Approach Briefing

"We're preparing for an ILS 02 approach into Lisbon, clearance limit currently INBOM, expecting the INBOM 1A arrival with the point merge arc around PESEX. Highest MSA in the area is 4000ft to the north. The approach starts at NETVO at 3000ft, with a standard 3° glideslope down to a minimum of 530ft, in the missed approach we go straight ahead climbing to FL60 and expect vectors. Extra fuel and time is now a little more than anticipated due to shortcuts, we now have a little more than 10min before we have to decide, and most likely that'll only get better as we get a shortcut on the arc. If we stay here, we could hold for just short of an hour, or 40 minutes plus a go around. The approach will be flown using flaps 3, for guidance I expect LOC and GS on AP 1+2 and with ATHR to 1000ft, manual thrust thereafter, and VAPP will be 138kts. On the runway we take autobrake low and max reverse to vacate right on H4. Stop margin is well over 1000m, and taxi in relatively simple, U and A to a stand somewhere at terminal 1. As for special operations, Lisbon has a mandatory speed limit schedule that they enforce. I don't see any non-standard operations, and the aircraft is healthy. As for threats, there's a lot of orographic turbulence on short final as soon as you come over the city, I have mitigated this with a flaps 3 approach for better maneuver margin. Furthermore, on the runway there's a taxiway stub that looks a lot like a rapid exit taxiway but isn't actually one so make sure to monitor that. The runway also has quite a noticeable upslope in the first third, only mitigation for that is awareness and an adjusted flare. Do you have anything to add?"

B.7.   Debriefing

"3.4t of fuel is a little more than we wanted on arrival here but given the circumstances I'd say our decision was justified. For the arrival, we were a bit on the conservative side with the descent planning but that gave us some more flexibility to comply with the ATC speed restrictions we were given. The turbulence occurred exactly as briefed and the mitigation was solid, we never even got close to VLS. Thank you for pointing out the crosswind given to the preceding aircraft taking off, that gave me some time to prepare. The landing was a little on the firm side, but in touchdown zone and on centerline, and we easily made the exit. Did you notice anything else we didn't brief?"