**Report from IFATCA Technical Operations Committee (TOC) Meeting**
**Vienna, Austria**
**January 20-23, 2015**
**Bill Holtzman, NATCA Rep to TOC**

## Executive Summary

TOC is working these papers/proposals for the April 2015 Conference in Sofia, Bulgaria.

| Title | Issue(s) | Conclusions and/or Proposal |
|---|---|---|
| Review of FF-ICE *Australia* | Concept to integrate ATC flight data globally by 2025 | Improving the technology behind flight data communication is essential, but years of mixed mode operations could be difficult. |
| Flight planning accuracy *Netherlands* | Global issues with coordination of flight plan information | Need to make it easier to file flight plans and insure they are complete through automated conformance checking. |
| Blended airspace *USA* | US is moving forward with a minimal remote tower concept. | IFATCA sees problems with a US plan for to provide a reduced services configuration for remote towers. |
| Future aviation weather data and distribution *Switzerland* | Provision of weather data to controllers is generally poor | Aircraft should be used to gather weather data. Weather info should be distributed to pilots independent of the ATC system. |
| Mandatory avoidance for uncontrolled flights *Italy* | European issue about mis-classified airspace | No desired outcome could be identified so the paper was tabled for action next year. |
| Introduction to Ground -based Augmentation *Spain* | GBAS enables precision approaches using GPS. | GBAS could replace ILS. It enables large numbers of flexible approaches and cheaper maintenance. Only authorized for CAT I now. |
| GPS altitude *USA* | Alternatives to pressure for altitude. | IFATCA encourages the development of GPS/GNSS-based altimetry. |
| Separation following TCAS RA *UK/Switzerland* | Re-separating aircraft after TCAS RAs can be complex | Controllers should be responsible for separation of all traffic once the pilots of the aircraft executing RAs report clear. |
| Weather deviations and terrain *Switzerland* | How should we handle deviations involving terrain? | ICAO should develop procedures controllers can use in these cases, and should update pilot -controller responsibilities. |
| Impact of PBN initiatives on capacity *New Zealand* | PBN procedures help airlines save fuel, but do they help ATC? | The data does not exist to draw meaningful conclusions. This paper will not be presented but some of it will appear in the magazine. |
| Display of information *Netherlands* | Lack of uniformity in the ATC displays worldwide | IFATCA should develop a document containing guidelines and principles for screen displays. |
| Maintaining ATS during crises *Netherlands* | Need guidance on handling major traffic changes – Ukraine, etc. | Training is needed on preparing and implementing contingency plans and handling degraded systems. |
| SWIM technical/legal *Italy* | What is SWIM and how does it affect us? | New system and protocol for communicating flight plans could keep them more up-to-date. |

## TOC Attendees

| | |
|---|---|
| Ben Gorrie, Australia – TOC Chair | Duncan Auld, EVP-Technical |
| Ruth Stilwell, IFATCA Rep to ICAO ANC | Bernie Daenzer, Switzerland |
| Bill Holtzman, USA | Renee Pauptit, Netherlands |
| Blaz Gorican, Slovenia | Raimund Weideman, Germany |
| Ignacio Baca, Spain | Kimmo Koivula, Finland |
| Benjamin van der Sanden, Netherlands | Aaron Wright, New Zealand |
| Christoph Gilgen, Switzerland | Oliviero Barsanti, Italy |
| Felix Gottwald, IFALPA, Germany | Rick Taylor, Australia |
| Alex Schwassman, Germany | |

## Other Attendees

| | |
|---|---|
| Patrik Peters, IFATCA President | Maurice Labonde, ICAO |
| Cindy Fitzgerald, USA | |

### Tuesday, January 20, 2015

**Administrative issues:**
Papers must be completed by February 8 and submitted to Tatiana. There was lengthy discussion concerning the use of Basecamp and Google docs. The need to be online to review papers was seen as a negative, since representatives are often traveling and not always connected. Basecamp is generally seen as a useful tool for collaboration.

The EB amended the per diem policy to provide for 60 USD per day. Expenses are now submitted through Concur, which requires a receipt.

**FF-ICE**
Rick Taylor, Australia and Blaz Gorican, Slovenia

This is a future design for flight data. It will include new fields such as the GUFI, a new unique identifier for every flight. This is the proposed format for the GUFI: us.ual.2013-02-05T12:12:57.4Z

The fields, in order, are region, organization or carrier, date and time GUFI requested with seconds to two digits. This format is not agreed upon, however. Nor is the means of communicating the data. Some would like the airplane itself to store the latest data set and deliver it to ATC via datalink.

It will also expand existing fields, so that additional information can be contained within the data set. A new protocol, FIXM, will enable FF-ICE to serve as a flexible data platform that can easily absorb changes in aircraft technology and capabilities. FF-ICE is

still under design, and it's not clear what mechanism it will use to synchronize the flight plan data among system users.

There is concern about the transition. It would likely take years if not decades of mixed mode operation. Implementation issues are of the most interest to controllers.

**Flight Plan Accuracy**
Benjamin van der Sanden

The paper suggests that users need to be encouraged to file flight plans by making it easy. However, by making filing easy may result in incomplete flight plans. The paper has some internal conflicts such as this because it also prioritizes automated conformance checking of flight plans. If there is significant logic processing of flight plans as they are entered, then they are more likely to be rejected due to incomplete data.

When it's difficult to file flight plans, operators may use repetitive methods for filing that do not contain accurate information. This is obviously not desirable. Flight planning regulations may be complex. But these issues should, as much as possible, not fall to the controller to handle.

The following policy was recommended:
*Flight plan interaction should be minimised for controllers engaged in separating aircraft. Electronic filing and automated conformance checking of flight plans are preferred.*

**Blended Airspace**
Bill Holtzman, USA

The state of Colorado is developing a remote tower solution called Blended Airspace that is unlike SAAB, Frequentis and other systems emerging today. Blended Airspace is less ambitious and tries to simply use existing surveillance (ADS-B and WAM) at numerous Colorado airports to enable the remotely located controller to control pattern and local traffic as well as issue departure and landing clearances. There would be no ground control.

HITL last June testing demonstrated that expected benefits could not be realized because the planned separation methods were not valid because the controller could not see the runway and verify "rolling" and takeoff. The program is morphing into something more like the other contemporary systems, as the project managers are considering camera systems and surface surveillance. It's very unclear where the project will go.

The project Concept of Operations identified a group of stakeholders, however this list excluded any representatives of the pilot or carrier community. The project has not created a business case for the concept, nor has any financial analysis been performed to

compare this solution with other alternatives including temporary towers, seasonally-open towers, and the status quo with CTAF. The Blended Airspace concept at present does not allow for the use of more than one runway and also deprives pilots of the ability to coordinate among themselves, which can be more efficient. All in all, this project has lots of question marks.

The intent to provide only some tower services was of most concern to IFATCA. While SAAB and others try to provide everything possible to enable the remote tower to do everything the traditional tower can do, the Blended Airspace has no such ambition but simply wants to spend less money. This strategy was questioned by this proposed policy:

*Remote and Virtual tower systems should be capable of providing the same service level as an aerodrome control tower; partial aerodrome control service configurations are undesirable*.

**Future Aviation Weather Information and Distribution**
Bernie Daenzer, Switzerland

The paper reviews incidents where lack of weather information causes problems. This includes a volcanic incident in Indonesia in which a Jetstar Asia flight flew through ash and the engines had to be scrapped. A number of runway excursions are seen to have been caused by a lack of accurate surface winds.

The paper seeks to separate weather dissemination from air traffic controller responsibilities. It also views each aircraft as a source of real-time weather data. A number of those present advocated for automated weather collection from aircraft accompanied by an automated system for disseminating that same weather information. This configuration would be comparable to the "Waze" traffic app, in which drivers can see the reports of other drivers along their planned route.

The benefit of such a configuration would be to get controllers out of the weather advisory business. If pilots can obtain comprehensive weather information including ride reports and graphical depictions of Doppler weather radar (as available to controllers), then controllers will never need to use frequency time to deliver this information. This would be an enormous benefit when ride conditions have deteriorated.

Local forecasts seem to need improvement, especially in the area of predictions related to fog. But the paper does not really substantiate this.

The group grappled with policy to encourage:

- *Automated collection of weather data, both by the meteorological community and by pilots*
- *Automated dissemination of weather data, including graphical tools, so that users can directly and independently access this information*

## Wednesday, January 21, 2015

**Mandatory Avoidance Action for Uncontrolled Flights**
Oliviero Barsanti, Italy

This paper concerns hazardous situations involving uncontrolled flights in proximity with controlled flights. The Committee found that the paper could not produce a meaningful and productive message. Presentation of the paper was aborted in favor of reconsideration of the topic in next year's work program.

**Ground-based Augmentation System (GBAS)**
Ignacio Baca, Spain

GBAS uses antenna in the vicinity of the airport to improve the accuracy of GNSS signals and enabled precision approaches using GNSS. GBAS could enable a more flexible precision approach configuration, cheaper maintenance costs (than ILS), and up to 48 approaches to different runways at one facility. It could also increase the runway capacity due to a reduction in protection areas. At present GBAS approaches are limited to ILS-like CAT I. In a future CAT III is expected and even guidance on land as well as curved approaches.

In the course of the research, the paper found that a number of IFATCA policies were either outdated or not appropriate. There were a large number of these such that getting the paper through the Conference might be difficult and would also move the paper off track. Rather than revise these policies through this paper, it was decided to break that part out into a separate paper for next year that would provide for other maintenance of the IFATCA Technical and Professional Manual.

Those sections involving policy revision were to be removed and to be added was a section on GBAS outages, including both scheduled RAIM outages and outages associated with space weather. GBAS requires local equipment at the facility, but satellite-based augmentation (like WAAS) does not and may prove simpler to maintain if performance is similar.

**GPS-Based Altimetry**
Bill Holtzman, USA

Aviation has used pressure-based altimeters since they were invented in 1928. Systems like GPS offer alternatives for the first time in history.

Lateral navigation has seen numerous improvements in precision, including NDBs, VORs, ILS, RNAV, GPS, etc. Vertical navigation has seen RVSM, but even that begins to fail at higher altitudes. With high altitude drones, more commercial space activity, Google balloons and higher performing aircraft on the horizon, it seems likely that the

skies will begin to get crowded above 40,000 ft. in the near future. Also emerging today are higher precision approaches with vertical guidance. The precision of these procedures is limited by the accuracy of barometric altimetry. Terrain clearance restrictions include large buffers associated with pressure altitude; airspace is wasted at low altitudes.

The 1000 ft. standard itself includes large buffers for pressure readings, and is rounded to make it a cardinal value (1000 ft. rather than something like 973 ft.). Use of GPS-derived altitude and the use of flight levels as letter codes could reduce buffers. This could increase the number of available altitudes significantly, increasing capacity and efficiency at all altitudes. Freeing aviation of its dependence on barometric measurements could eliminate the inordinate of vigilant drudgery that is required today, including the constant issuance of altimeter settings, the maintenance of systems to obtain those settings, and the various procedures designed to eliminate errors in the use of those settings including cold temperature corrections and many other behind-the-scenes methods.

Today, GPS itself does not have the precision to be used for general altimetry. Augmentation systems such as WAAS and GBAS are needed for precision approaches, but these cannot support global altimetry. When additional positioning satellite constellations (European Galileo, Chinese BeiDou, etc.) deploy, this could change.

GPS also can be affected by space weather and radio interference, whether intentional or accidental. Current efforts to provide multi-frequency signals will mitigate these issues. There are other issues as well. The TOC proposed the following policy:

*IFATCA encourages development of technologies that improve the accuracy of vertical navigation*.

**Resumption of Separation after TCAS RA**
Chris Gilgen, Switzerland and Luis Barbero, UK

The paper focuses on who is responsible for separation between the point at which a TCAS maneuver is completed by the pilot and when the aircraft is technically separated from the traffic. Once the pilot has reported clear of traffic, there is no set rule as to how the pilot is to resume navigation. But it's not best for the pilot to determine this. The controller has the "big picture" and can best decide how to get the aircraft back on the route and maintain (or establish) separation from all other traffic.

It delineates between "responsibility" and "accountability":

- Accountability: a requirement to justify actions, decisions.
- Responsibility: an obligation to do something, as part of one's job or role.

Existing IFATCA policy states: "The controller shall not resume responsibility for providing separation" but it does not specify separation between which aircraft."

But the controller cannot responsibly watch a situation develop in which the TCAS aircraft moves into conflict with a third aircraft or makes some other maneuver that is not necessarily safe.

The proposed policy:
*Once an aircraft departs from its ATC clearance or instruction in compliance with an RA, or a pilot reports an RA, the controller ceases to be responsible for providing separation between that aircraft and any other aircraft affected as a direct consequence of the manoeuvre induced by the RA. The controller shall resume responsibility for separation and establish standard separation between all affected aircraft when:*

a) *the controller acknowledges a report from the flight crew that the aircraft has resumed the current clearance; or*
b) *the controller acknowledges a report from the flight crew that the aircraft is resuming the current clearance and issues an alternative clearance which is acknowledged by the flight crew*.

The conversation segued into upcoming ICAO reporting requirements in the aftermath of the missing Malaysian jet. Our Australian colleagues mentioned how aircraft go missing frequently in the Indian Ocean. Each ADS-C report costs something like $6.

**Responsibility for Terrain and Obstacle Clearance during Weather**
Aaron Wright, New Zealand

There are inconsistencies in current procedures as to who is responsible for terrain clearance under various situations.

Duncan wants to distinguish between any clearance initiated by the controller vs. maneuvers or routings requested by the pilot. One of the sticking points is that ICAO documents refer to direct routings and "off airway" routes. In today's world, most aircraft are off airways so that implies the controller is responsible.

Ben wants consistency. There shouldn't be one rule for weather deviation and another fir direct routings.

Bernie referenced the US methods described in 7110.65 5-6-3 which enable the controller to vector below the minimum altitude based on the depiction of obstacles and terrain on the controller display. This is seen as a practical way of handling these situations. He would like to see ICAO pursue this sort of method.

**Effect of PBN on Capacity**
Ignacio Baca, Spain

There is not a lot of data on how PBN procedures will affect capacity. It appears in some cases that there will be a reduction in capacity due to longer tracks.

According to Dennis Kelly (NATCA PBN), route segregation of arrivals and departures using PBN provides advantages at some airports. Off the Ground methods join the RNAV departure procedure ~500 feet off the ground and never come off. This works at ATL and DFW because even though they fly farther to be segregated from arrivals, they can pump traffic out faster. They can't handle vectoring that many aircraft at high volume and be consistent enough to be as efficient. At slower airports, the segregated routes tend to be longer and therefore reduce capacity to a small degree.

Recent efforts at Denver Metroplex found fuel savings of $5 million annually for departures. This came at a cost of an extra $1.1 million worth of fuel used by arrivals. Conflict points in the terminal area were removed but controllers report increased workload. According to Dennis, this case was an anomaly as downwind legs were lengthened to accommodate the departures and this would not be doable elsewhere.

Except for Denver and a few other cases, there is a distinct lack of hard data, and so it is difficult to produce a paper of much value. Rather than present this paper, TOC will pursue publishing it in the Controller magazine and meanwhile approach ICAO about its interest in educating controllers about PBN.

**Short Term Conflict Alert (STCA)**
Chris Gilgen, Switzerland

Production of a manual on ground-based safety nets is underway by ICAO. These include STCA, MSAW, APW (Area Proximity Warning), and APM (Approach Path Monitoring).

IFATCA has existing policy on STCA but they refer to radar. Chris would like to replace the radar term with ATS-surveillance to make the policy more current.

**Non-Plannable Level in the NAT Region**
Chris Gilgen, Switzerland

The existing policy is no longer relevant or needed:

*Introduction: There is evidence that there is an identifiable number of incidents which require an aircraft to divert or for ATC to intervene which does not require a descent out of the NAT track structure.*

*Policy: Within the NAT region where RVSM is in operation, FL 300 would be established as a non-flight plannable level as part of the "in-flight emergency contingency" procedures as they apply to the Organised Track System.*

This logic is no longer recognized as operationally meaningful.

## Thursday, January 22, 2015

This was a joint meeting with the Professional and Legal Committee.

**Screen Display**
Rene Pauptit, Netherlands

What do we want to achieve with this paper? Do we want to create IFATCA guidelines for the design of controller work stations? How would we develop these guidelines? Some example principles:

- condense multiple screens into one
- display of warnings consistent
- toggling capability

There was consensus that an IFATCA guideline would be of value. The paper will recommend the development of such a document.

**Crisis Management**
Sten Verpalen and Rene Pauptit, Netherlands

Three phases of crisis management: Preparation, response and recovery.

The OCIR method of handling crises consists of:

- Operate – implement the local contingency plan
- Coordinate – consult with local parties before taking action
- Inquire – get opinions and ideas from the experts
- Relate – communicate intentions to outside parties

At the 2008 Conference, the IFATCA Executive Board presented the Crisis Response and Communications Planning Guide as a guideline for the Member Associations to help in the process of preparing for, and dealing with events which could be categorized as a crisis, or which could evolve into a crisis. The current paper seeks to update this guide.

The paper encourages better training and preparedness for crises through new policies.

**SWIM Technical and Legal Isssues**
Oliviero Barsanti

SWIM is infrastructure technology to enable sharing of flight data among all system users and interested parties. Every aircraft will supply data to the system to be made available to all. SWIM is an important part of ICAO block upgrades.

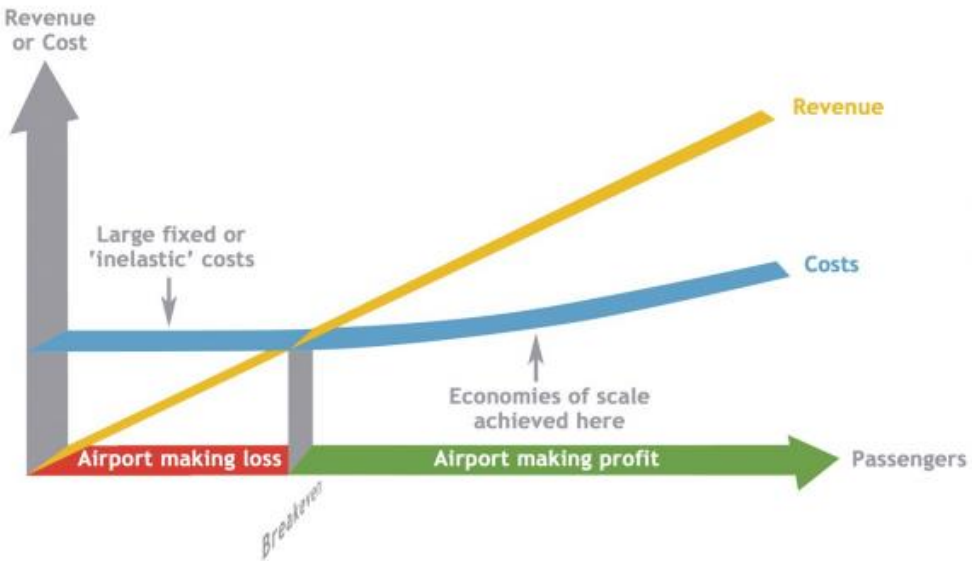
There are legal issues because the data must be restricted by user access level. The input of the PLC was needed on this topic.

The consensus was the controller really doesn't need access to some SWIM data nor need to know how the data is communicated, stored or processed. They simply need access to certain data elements in a convenient fashion.

SWIM offers to take the controller out of the information loop in a good way. For instance, if there is a medical situation if the aircraft and the ground staff have a way of communicating, the controller does not have to relay messages. This is comparable to the weather dissemination configuration mentioned in the Future Weather paper. Independent channels for pilots to get weather reduce the need for controllers to spend time reading or calling weather on the frequency.

This is an information paper only.

**Frequentis presentation: Remote Virtual Tower Solution**
Thomas Fraenzl




The figure shows a generic justification for remote towers. Germany, Norway, Ireland and New Zealand have all initiated RFPs for a remote tower installation. Frequentis expects 150 installations by 2025. Only one airport in Sweden has been certified for any remote tower (and they selected SAAB), and only for a specific period of time with less than a specific number of aircraft.

Duncan mentioned how some mining towns in Australia didn't have adequate housing, so the ANSP had to pay huge sums to provide controllers with housing. Assuming distance limitations were not restrictive, remote towers could eliminate this problem.

Remote center must have robust connection with the field. Bandwidth must be adequate to carry voice, data and video in both directions, with radio, camera, lighting and other control messages going to the field from the center. All of that is about 100 Mbps. A contingency solution must also be in place possibly using a satellite connection.

According to Thomas, simultaneous control of multiple airports is the only business case that works for remote tower.

ANSPs are afraid of regulation concerning the infrared cameras. Their infrared does not look for heat-emitting objects, but instead looks for temperature differences. The infrared image is augmented with radar or ADS-B data. Wind and RVR information is also displayed on the video display.

Surveillance display is linked to cameras, such that clicking on a surveillance target can cause the PTZ cameras to track that target.

Display options include a synthetic view from the cockpit.

Cameras can be configured specifically for the individual airport environment. Specific cameras can be pointed directly towards the direction of the standard instrument approaches with appropriate lensing and zoom. SAAB has one screen per camera, but Frequentis assembles the images which can then be displayed in various formats and segments.

The video can be displayed in compressed form such that the controller can see a 360 deg view in 120 deg, but it can also show the video in standard form with the ability to rotate the field of view.

The classic Johnson criteria of managing situations includes Detection, Classification, and Identification.

Bill asked Thomas to demonstrate the handling of multiple scenarios simultaneously by giving one presentation to PLC and another to TOC at the same time. Thomas deferred on this, claiming it was somehow different.

It was mentioned that Airways New Zealand had just decided to cancel their plan to test the Frequentis system. Thomas explained this was because the business case did not support it, but we were advised the decision was based on the technology being unable to perform as advertised.

Overall, the technology seemed promising but was going to take considerable more investment and time to “certify”.

No data was presented on the ability of the software to match video surveillance with ADS-B or other surveillance. Does it ever confuse one aircraft with another or even with some other video feature such as a bird?