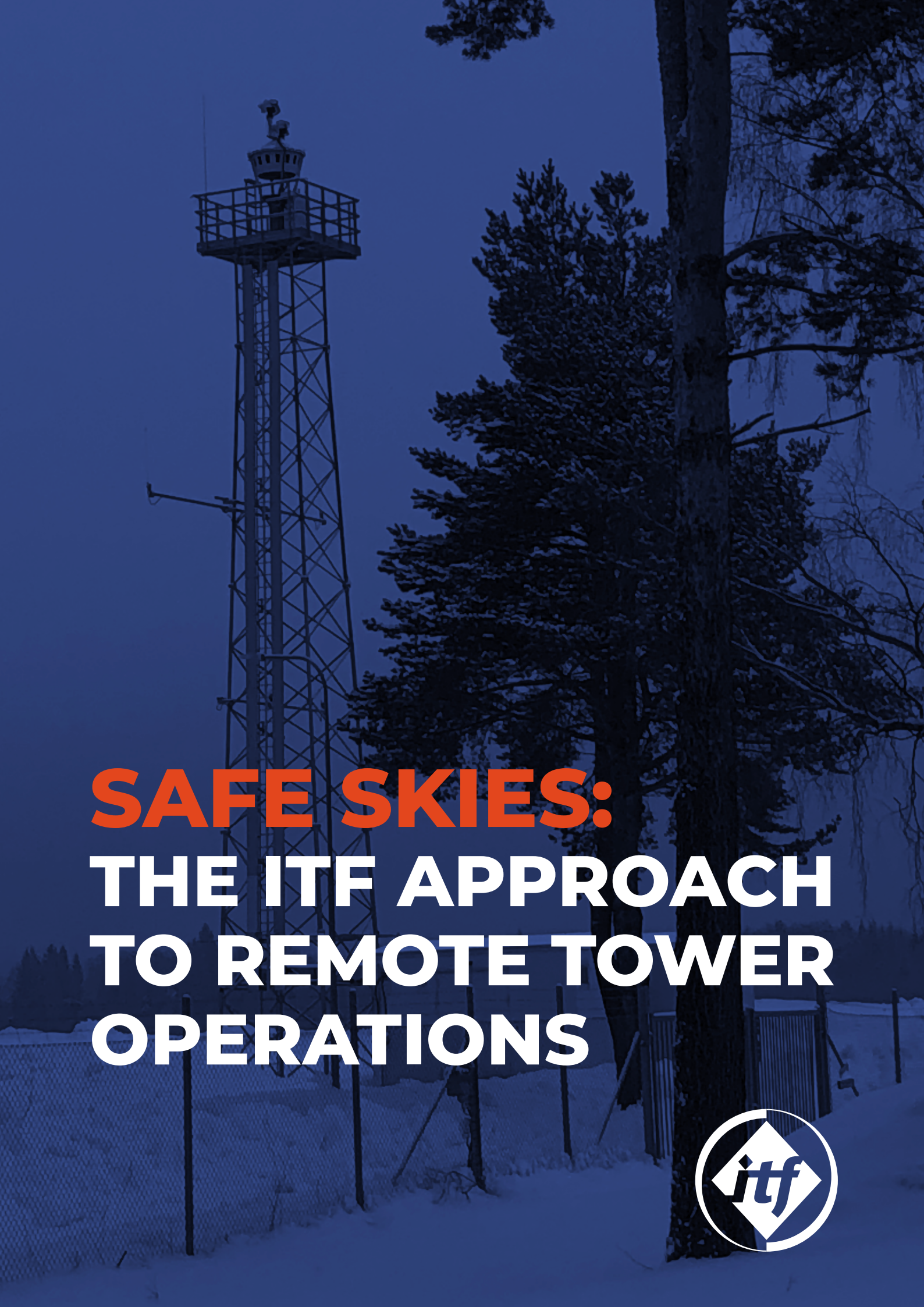

SAFE SKIES:
THE ITF APPROACH TO REMOTE TOWER OPERATIONS

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The International Transport Workers' Federation (ITF) is a democratic, affiliate-led federation recognised as the world's leading transport authority. We fight passionately to improve working lives, connecting nearly 700 affiliated trade unions from 150 countries to secure rights, equality and justice. We are the voice for nearly 20 million working men and women across the world.

This position paper outlines the ITF's approach to remote tower operations, an important new technology emerging in the aviation sector. While the ITF, unions and workers have serious concerns about some proposed applications of this technology, we are keen to work constructively with government and employers to manage its introduction in a safe way.

If you want to discuss further the issues raised in this paper, please contact civilaviation@itf.org.uk.

A. EXECUTIVE SUMMARY

The ITF has established a working group for its members from around the world to keep up-to-date on the developments regarding **remote tower operations (RTO)** and to share experience relating to what can work and what should be avoided.

In the following document, the ITF sets guidelines for its members to assist them when discussing projects for remote tower operations but also red lines to be translated in international and/or national regulations in the various domains to explore before using RTO. **Acceptance of the staff is essential for the success in getting remote tower operations in motion.** This can only be achieved through a dialogue where concerns raised are appropriately mitigated.

RTO will essentially be introduced to lower the cost of service provisions either to make it available to aerodromes where it previously was not or to save money on existing services.

It is therefore essential:

- to **keep safety levels unchanged** at worst and to apply a full safety analysis to all changes in consultation with staff organisations;
- to have **solid and enforceable regulations** prohibiting unsafe operations to happen under cost pressure, and to define safety requirements and contingency scenarios;
- to have a realistic plan for operations taking all contingencies into consideration and to ensure a **comprehensive and thorough change management process** including the necessary social agreement;
- to have a **robust technical solution** to support remote tower operations including engineering aspects and that training and competency is properly defined and delivered;
- to avoid one-sided gains and to find agreement of all affected parties. In particular **due consideration should be given to the economic impact on remote communities** resulting from the introduction of RTO;
- to establish a **strong social dialogue** to negotiate suitable agreements to support a good work-life balance to prevent any forced mobility and to mitigate possible negative effects of any change;
- to consider the **human element** including all aspects regarding training and required new competencies and skills, and limitations of multiple qualifications of ATCO's.

Having a realistic plan for RTO includes assessment of the human element of the operations. Training should play an essential role as well as design of the technical solution involving future operators and catering for their needs. With this in mind, the **ITF is highly concerned about the safety consequences of multiple modes of operations** and insists the proof of its feasibility and safety is demonstrated before approval of such operations by the competent authorities.

The ITF and its affiliates are ready to support any efforts to develop, implement and regulate remote tower operations.

B. PREFACE

Remote Tower Operations (RTO) is the concept of providing aerodrome air traffic services (ATS), either control or information services, from a location which may differ from the aerodrome itself. Technological research and development of this concept is performed largely through publicly funded programs like SESAR (EU), NextGen (USA) and others. A growing number of leading industry suppliers, air navigation service providers (ANSPs), national supervisory authorities (NSAs), governments and airspace users are pushing for some form of implementation of the RTO concept for various reasons. Where formerly mainly low-density aerodromes were subject to RTO discussions, currently more complex aerodromes with much higher traffic densities are being considered with some airports in the transition phase of RTO.

So far, the RTO concept covers different modes and purposes of operation:

- **Single mode of operation**
  provision of ATS from one remote tower/remote tower module for one aerodrome at a time;

- **Sequential mode of operation**
  an air traffic control service provided to two or more aerodromes with only one aerodrome being provided with an ATS service at a time from a remote tower module (RTM), including the possibility for a controller to switch from one aerodrome to another;

- **Multiple mode of operation**
  Provision of ATS from one remote tower/remote tower module to two or more aerodromes at the same time (i.e. simultaneously);

- **Contingency operation**
  an air traffic control service provided from a remote location to be used as a contingency site in the event of a failure of the conventional facility;

- **Remote tower module (RTM)**
  a combination of systems and constituents from where remote aerodrome ATS can be provided, including one or more ATCO/AFISO workstation(s) and the visual presentation. It can be compared with the tower cabin of an aerodrome conventional tower. The visual presentation replaces the OTW view of a conventional tower, with the purpose of providing a view of the aerodrome and its vicinity (i.e. area of responsibility);

- **Out-of-the-window (OTW) view**
  a view of the area of responsibility of the aerodrome ATS unit from a conventional tower, obtained via direct visual observation.

As the development of the technology evolves, more ANSPs are drawing up plans for deployment of RTO. Many factors need to be addressed including regulatory requirements, human factors aspects and training, stakeholder and social partner engagement etc. However, it is fair to say that in many cases, necessary and appropriate engagement and consultation is seriously lacking. This imbalance raises serious concerns. This position paper shall give guidance and will highlight the areas where much more effort is required of all stakeholders to facilitate a safe service alongside a socially compatible and acceptable evolution and implementation of the RTO concept.

Currently, remote towers come into existence in two ways. This is either through the introduction of any level of ATS at aerodromes where no such service was previously provided or the moving of existing ATS from a conventional aerodrome control tower at which the service is currently provided to a location where no direct visual observation of air traffic exists.

C. GENERAL CONSIDERATIONS

The safety dimension

For remote tower operation, a robust safety case is necessary to ensure an adequate level of safety has been achieved and will be maintained in operation. The safety case shall consider the technical and system verification and validation, reliability, contingency scenarios, maintenance requirements, training requirements and specification of operational data necessary to demonstrate safety levels/targets. Additionally, it is absolutely essential that any RTO complies with national or regional regulatory targets to improve the level of safety. **Under no circumstances may the safety of RTO drop below the level of the existing standard**, which - in any case - shall not be below the required level of the applicable regulations. The assessment of the human factor aspects must ensure that human performance is not negatively impacted.

Maintenance processes on site and remotely may increase the complexity compared to conventional towers. These and all other changes, new operational procedures, redesigned airspace structures and collection of operational data must be subject to a full safety analysis and the positive outcome of a robust safety case, in consultation with staff organisations. Where not introduced yet, the ANSPs need to create bodies to conduct and discuss such risk assessments, and include workers' representatives in these bodies. **The ITF and its affiliates are willing to contribute their expertise to ensure a robust outcome**. Our experts are also able to contribute to and develop strategies to mitigate the threat of cyber-attack. Common strategies are needed for data transfer that is quick, safe and reliable.

A Remote Tower Center will require adequate contingency procedures. An unexpected failure of more than one tower in a region will have a serious impact on the airspace users and the flight planning of their alternate destination aerodrome.

The regulatory dimension

Introducing new technologies requires new methods of operation. RTO is a concept where no global standards or requirements yet exist. Where attempts at regulation have been made, this activity was not fully sufficient and is not suitable for regulation of global RTO.

The ITF is concerned that worldwide regulation is lacking. Although some regulators, e.g. EASA, have produced guidance material, this is not binding regulation. Unsafe operations must be prohibited through regulation. Moreover, the currently available EASA guidance material does not address all the licensing issues and socioeconomic aspects which have an effect on safety. The ITF believes that most national regulators have not yet addressed the issue at all.

The ITF cannot support a fragmented approach towards this sensitive concept, with its serious implications for operations, safety, **workers' lives, airspace users, and service providers. Non-existent global regulations of the various modes of RTO may lead to an inconsistent, fragmented and potentially unsafe operation**. Moreover, regulators must ensure that clear licensing requirements are set and that the necessary training for ATCOs, FISOs and engineers is arranged. The lessons learnt from early implementations must be shared. It will not be sufficiently comprehensive to address regulatory issues for RTO without considering social and economic aspects. Maintaining and improving the current level of safety shall be paramount for all regulation.

Therefore, regulation for operational, technical and training issues is needed. Moreover safety requirements for RTO shall be defined. Also, the questions of contingencies for RTO sites need to be addressed. Alongside the national regulators, the **ITF encourages ICAO as the appropriate body to support and facilitate urgently-needed regulation** for global aviation to ensure that local civil aviation operations and regulations conform to global norms.

The ITF is ready to actively contribute its global expertise, involving experts from all professions including ATCOs, FISOs, engineers and scientists. **The ITF and its affiliates are highly experienced in working with regulators all over the world**, currently playing an active role in the FAA and EASA. Only the ITF, as a global organisation, represents staff from the complete aviation chain, from ground staff to ATS to air crews.

The operational dimension

The introduction of RTO requires a comprehensive and thorough change management process in order to specify and implement the changed Method of Operations (MoPs). There is currently only limited experience and data of RTO in single mode of operation.

The ITF is aware that various organisations are exploring multiple mode RTO. There are serious concerns with multiple mode RTO due to the significant complexities involved along with the potential safety implications and no operational experience exists with a multiple mode RTO. Only limited experience with single mode RTO is available and currently not sufficiently shared. **The experience from the single mode RTO cannot be transferred automatically into a multiple or sequential mode environment.**

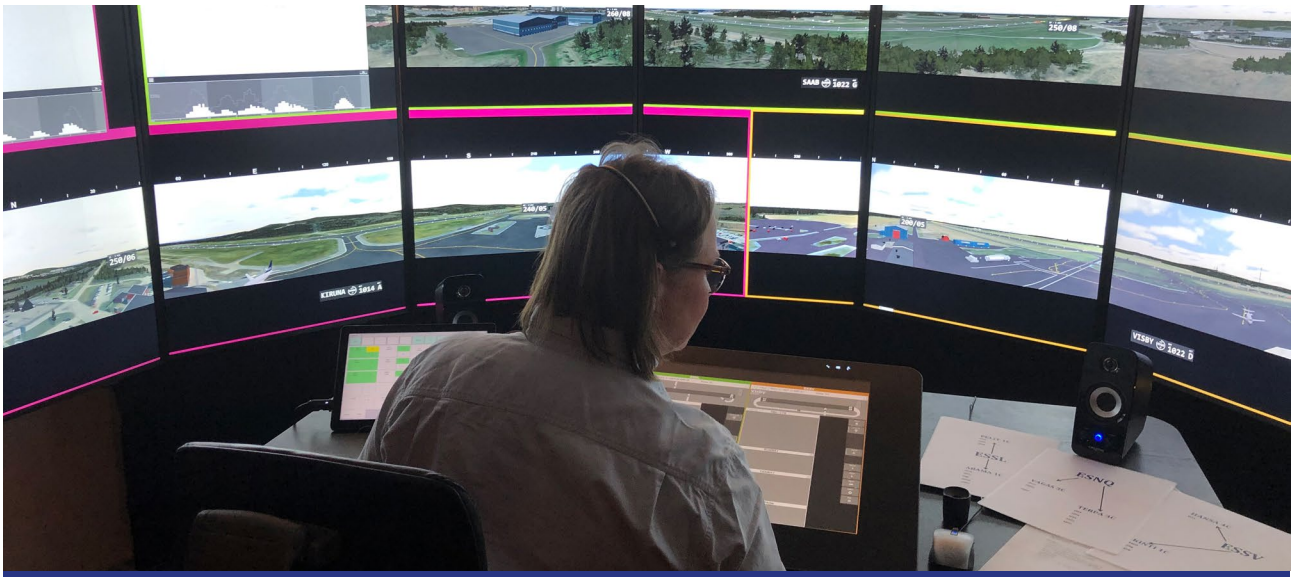
With regards to a sequential mode of operation, there is a complete absence of binding regulation or even guidance at a global level that might deal with issues such as the combinations of qualifications held by an ATCO and that may be exercised within which time periods, including any minimum times between 'switches'. **Clear and verifiable rules and practices on how to 'switch' from one aerodrome to another are needed.** By focusing on these and other issues that are evident, it will help to deal with the broader topics of safety, whilst also tackling ATCO fatigue & workload management for example. It might be helpful to note that current guidelines in Europe (EASA) stipulate that flight crew may only operate one aircraft type per day (where multiple type ratings are held).

The ITF expresses in the strongest terms its concerns over multiple/simultaneous modes of operation. Trials have so far taken place in unrealistic conditions and without proper involvement of staff. In a multiple mode of operation, the ITF believes that there are a multitude of variables that could negatively impact safety.

These include the following non-exhaustive list of broad topics:

- Varying airfield characteristics / runway orientations.
- Varying weather phenomena and other environmental factors.
- Varying procedures and actions, including in the event of emergencies.
- Varying traffic characteristics and patterns.
- Technological aspects including varying equipment and frequency management.
- The resulting impact of these, and others, on ATCO workload and fatigue.

Weather observation on RTMs will need to be done through the visual representation of the RTM. ATCOs/FISOs must be provided with suitable possibilities and procedures to enable the most authentic perception of the prevailing aerodrome weather and to guarantee the same level of safety.
The contributions of all relevant stakeholders but especially ATS workers must be included when developing an RTO. Without a well-established social dialogue and adequate social partners' agreements no remote tower should be allowed to go into operation.



The technical dimension

RTO places greater dependencies on technology given the digitalisation and data transfer of real time visual information and representation. This technology must be integrated with existing data feeds and processing which creates a highly complex technological system. The increased level of complexity combined with increased dependence on the system means proving the system, including safety requirements, is costly and difficult to achieve. In order to address reliability, availability and resilience requirements, contingency scenarios should be considered.

An additional requirement for RTO is a redundant high-speed, high bandwidth and highly reliable data link between the aerodrome to the RTO site. Due to the reliability, availability and resilience requirements, redundancy is an essential design feature in the data link. Depending on the safety requirements there may be a need for multiple mode of data link.

Cyber security is a key consideration as greater reliance is placed on digital systems. ICAO's vision is: "...for global cybersecurity is that the civil aviation sector is resilient to cyber attacks and remains safe and trusted...." Cyber security must be an essential part of the technological solution with appropriate processes in place for monitoring and managing cyber security.

Standards for surveillance, range and quality of visual presentation, and display resolution need to be set with minima defined. ATCOs and FISOs must be provided with an adequate replacement for the OTW view. This must be reliable and technology must be redundant.

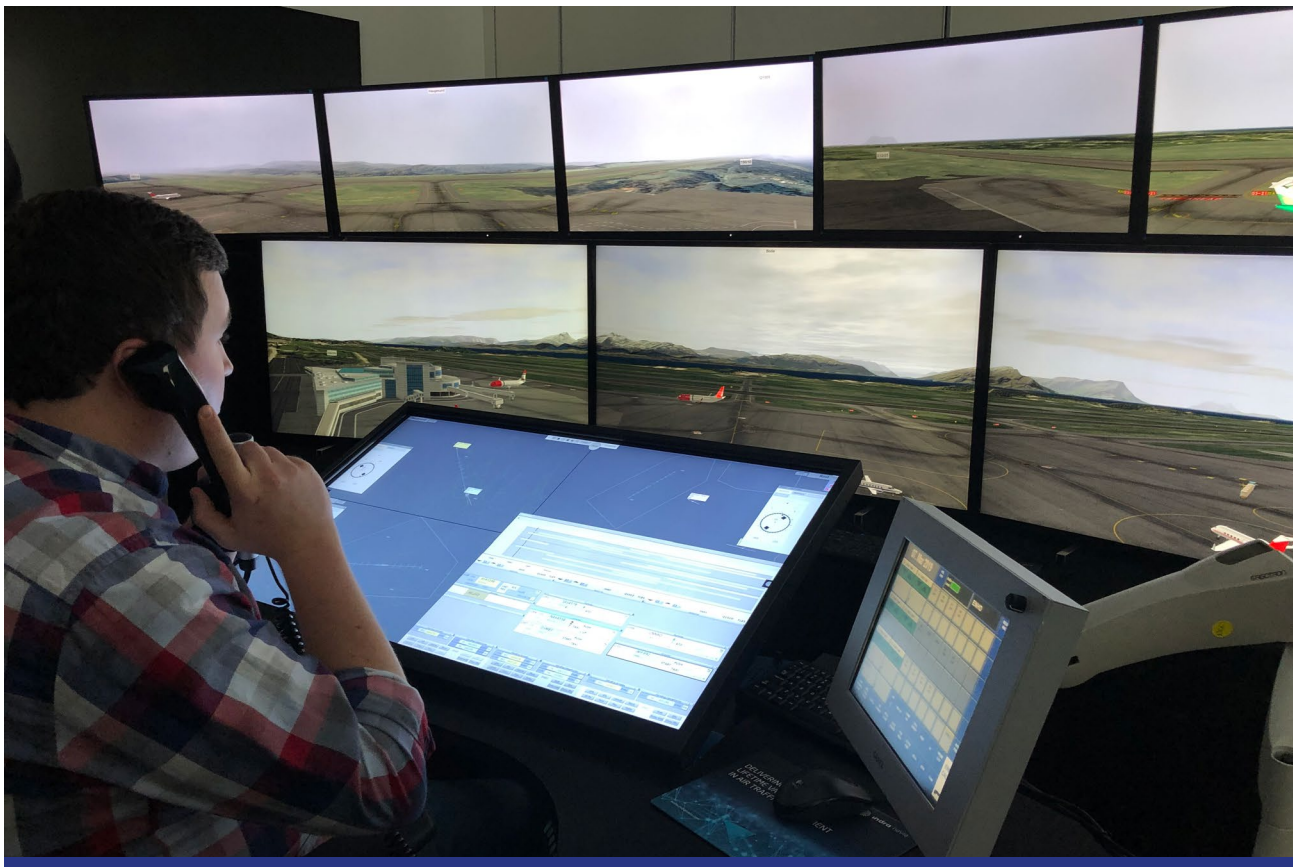
Weather observation is normally done from conventional towers. In RTO, technology and especially the visual representation must be capable of providing an equivalent replacement.

The technological solution combined with additional complexities, cyber requirements, reliance on suppliers using different technical standards, maintaining systems both on the airfield and at the RTM all combine to create a more complex environment for the engineering/technical staff. **It is essential to ensure that the method of operation includes the engineering aspects and that training and competency is properly defined and delivered.** Engineers represented by the ITF are willing to contribute to the demanding work to be done to enable a stable, solid and safe RTO.

D. ESTABLISHING NEW SERVICES

The ITF is in favour of newly created jobs in aviation and the surrounding industries. Due to a service level upgrade, new businesses and jobs can be created in both the aerodrome region and around the remote tower site. An upgrade of ATS services of an aerodrome may lead to an increase of air traffic and a higher level of safety at the same time. Attracting higher numbers of aerodrome users will lead to an increase in local spending power and is likely to have a positive implication on at least the regional and national economies, including the labour market. Therefore, the ITF welcomes any effort that improves the quality and safety of ATS at aerodromes. However, all participants of an economy must share in its success. **Any effort shall be taken to avoid one sided gains to the detriments of other stakeholders in an economy.**

In future, RTO may be used as a way to implement new service levels which are not yet defined. Specific care must be taken to ensure that this does not lead to confusion amongst pilots. The ITF and its affiliates are ready to cooperate in the work to be done to define and set appropriate standards for any sort of ATS. **Where new intermediate ATS services are created, special attention must be paid to safety issues, especially to avoid confusion and/or wrong service expectations of pilots.**



E. TRANSFORMING EXISTING SERVICES TO REMOTE TOWER MODULES

The economic dimension

A transfer of service provision from any aerodrome to an RTO site away from the aerodrome can lead to an outflow of spending power farther from the region where the aerodrome is situated. **Investments in ATS infrastructure are also investments into the regional economy.** Because of the high qualification and demanding skill set of ATS personnel, earnings of staff are often above the average national income. Staff have a higher disposable income available to be spent in the local economy. A relocation of highly qualified and higher earning staff will lead to an outflow from the regional economy. As a consequence, this might drive the need for greater public spending in these regions. Therefore removing services and staff from an economically small region can introduce additional problems to an economy, causing damage to regional and national affluence.

Consequently, the ITF emphasises that the total cost of implementing an RTO must be considered. **The ITF believes that wealth and affluence should be kept in the regions and that regions should not be starved out in favour of bigger economic centres.** The regions must benefit from their own added value and economic performance. The ITF endorses a broader view which considers the impact on regions and opposes a limited view on ANSPs only. For the same reason the ITF generally opposes service downgrades. Sometimes, ANSPs have plans to reduce the level of service provided at some aerodromes for cost saving reasons. Such strategies highly raise our concerns.

In specific situations, the staff affected may be happy to accept a move of the workplace. The ITF accepts the need for ATS service in remote regions and will support such agreements for the greater good, provided all interests are well balanced. The ITF and its affiliates are ready to give advice to governments and ANSPs to facilitate good decisions regarding the service level required, the possible effects of service level changes, and to contribute in social partners' joint efforts.

The social dimension

The ITF is against a reduction of jobs and quality of work and in contrast it supports a good work-life balance for all ATS workers. A new RTM possibly involving forced mobility or a longer commute to work endangers this work-life balance.

The ITF's affiliates report that it is often the case that staff do not wish to relocate. This is for quite obvious reasons: people have their families, friends, and social lives organised around their place of work. A move to a different working location leads to a loss of social life and interaction, will induce stress, and have severe negative implications on private life and families. Besides that, workers might be confronted with a change of employer, involving new contracts, working conditions and payment schemes. Therefore we are opposed to any means of forced mobility. The ITF encourages all employers to facilitate an adequate work-life-balance for their workers. The social partners are invited to negotiate suitable agreements to allow this and to mitigate possible negative effects of any change of the workplace. **A strong social partnership will also recognise the fact that sometimes in a renewed working environment the work quality can improve.**

The ITF is concerned that besides service upgrades, a key driving force for RTO is the reduction of costs. We also see the danger that the ultimate price will be paid by the workers, either through reducing the number of jobs or reducing available income.

F. HUMAN FACTORS ASPECTS

The change from conventional tower operation to RTO describes a substantial impact on the working environment and working methods for all involved: ATCOs, FISOs, engineers, technicians, and administrative staff of affected ATS facilities. All routine and experience was established previously, during conventional tower operations. This is not directly applicable to RTO. Human skills develop over time. So, sufficient time must be foreseen for a successful transition of operation. Additionally, new system limitations will have a relevant impact on working methods. As a consequence, **adequate training and change management is required.**

Like any other technological change, a transition to RTO requires efforts and adaptations by workers. Any such transition will cause stress to those involved. This stress has multiple sources and includes mandatory training and changes to the workplace, but also stress caused by impacts on the social life of the workers affected.

If present, physical distance from the place of actual operation can result in different perceptions of weather, runway conditions and sense of traffic. Methods for best possible mitigation must be developed and the necessary time and adaptations must be given to enable adaption.

The changes in the technology they are using creates an increased need for training for engineers. **A comprehensive competence scheme is needed to satisfy the requirements for higher professional qualification.** Engineers will be expected to deal with additional tasks, including cyber security.

To set-up all procedures, rules, regulation and employment issues, an extensive process of consultation and negotiation with all stakeholders, including organisations representing all aspects of workers' interests, must be held. The ITF and its regional representations are able to contribute at all levels of decision-making, including the global efforts of ICAO, multinational institutions, national regulators, and employers at all levels. **The joint aim shall be a safe and stable ATS system offering the required capacity, the most suitable technology, skilled workers, a functional economy, and social harmony.**

It is essential that high quality independent scientifically based studies be conducted in order to demonstrate a thorough understanding of the introduction and operation of RT. Specific research shall be carried out to explore all limitations, possible threats and mitigations of any RTO.

Training plays a key role in our human factor considerations. When transferring qualified ATCOs to a new working environment, adequate ATC unit training has to be arranged to apply the rating competences in the new local environment. This unit training shall include a phase of pre on-the-job training and on-the-job training. Engineers will also require appropriate training to obtain the necessary new competencies and skills. To achieve the necessary level of competence and hence aviation safety, a training plan and an assessment plan with interim competency standards shall be developed. This plan shall also consider that competencies for engineers may vary significantly from the requirements in a conventional tower. Engineers will have different work places at the RTM and the aerodrome.

Continuation training to enable operational air traffic controllers to maintain the validity of their license and enhance their existing competencies, and refresher training must ensure that the required proficiency for the working positions for different aerodromes will be maintained and ideally be extended. However, the ITF sees that a limit for multiple qualifications of ATCOs would need to be fully assessed, researched and agreed depending on the circumstances previously mentioned in this paper.

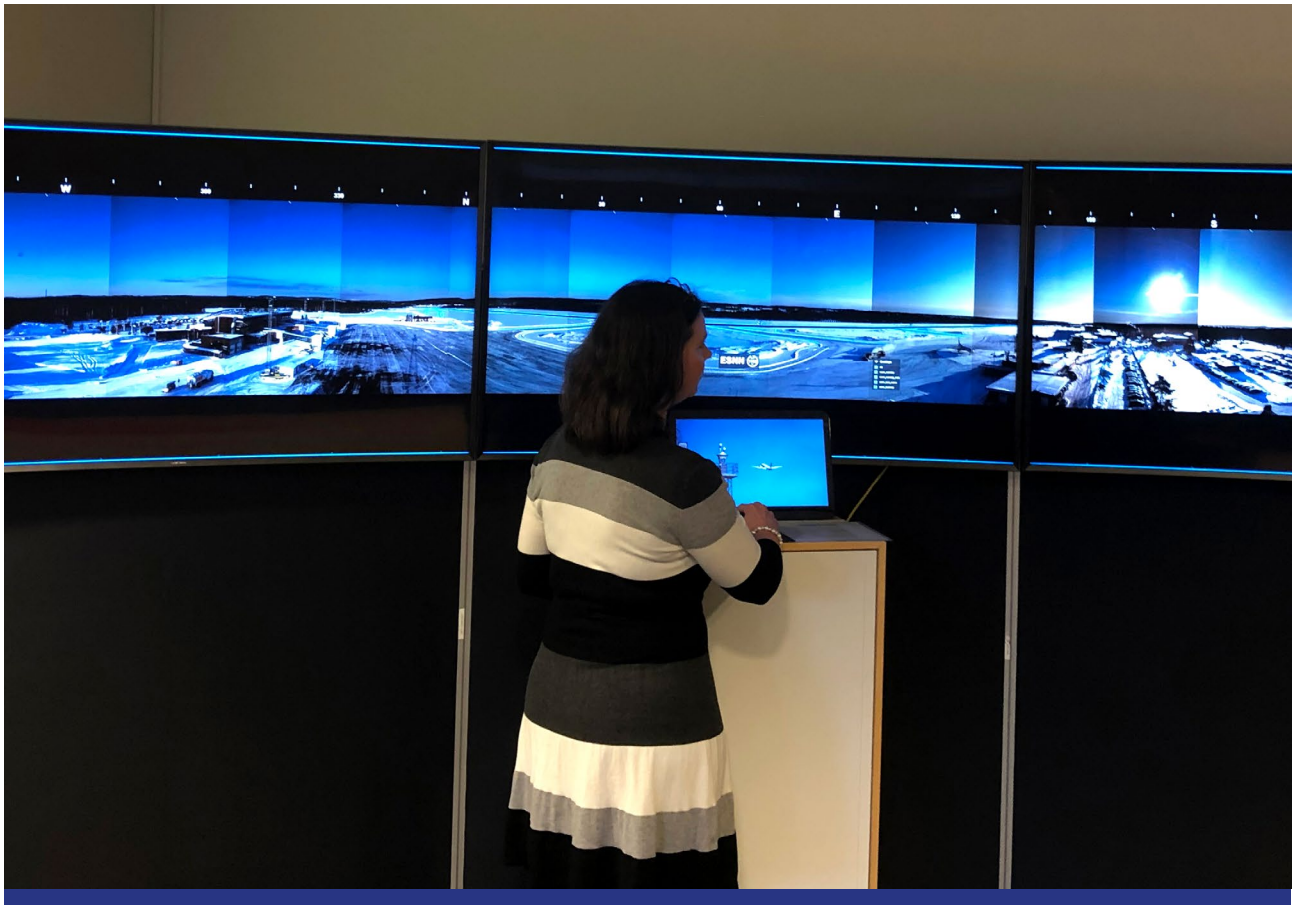
The ITF and its affiliates are ready to contribute to the necessary work to be done to achieve the required materials and standards.

G. CONCLUSION

It is essential that an international regulatory framework is established to balance the economic interests which are likely to trigger the interest for RTO against other key factors such as safety. **The ITF is ready to engage with ICAO and with regional and national regulators to develop the best possible regulatory framework around remote tower operations.**

The ITF and its affiliates will continue to follow remote tower operations developments to assist its members in having the best possible work environment and the best possible working conditions. Moreover, the ITF will support its affiliates in their engagements with regulators and employers to achieve acceptable standards of RTO implementation.

It is essential to support any effort to have a fruitful social dialogue around the introduction of RTO. The ITF commits to this in view of supporting job development in ATM, avoiding one-sided gains and reversing the force of proof to have feasibility of projects fully demonstrated before implementation.



INTERNATIONAL TRANSPORT WORKERS' FEDERATION

49 - 60 Borough Road
London SE1 1DR
+44 (0)20 7403 2733
itfglobal.org
/ITFglobal
@ITFglobalunion