Subject matter and scope

This Implementation Objective aims at an efficient use of voice over Internet Protocol (VoIP) by harmonised and coordinated implementation for ground/ground and ground part of ground/air aeronautical communications, ensuring network benefits from VoIP implementation.

The initiative covers inter centre (encompassing all type of ATM Units) voice communication and the links with the ground radio stations. COM11.1 is applicable to 'En-Route' and 'Network' Operating Environments.

Inter-centre voice communications are currently mainly performed via analogue and digital circuits. This legacy ATM voice services will soon no longer be supported by the European telecommunication service providers, making the use of new technology necessary. At present and in order to follow the evolution of the communication technologies, ATM-VoIP is the global standard (ICAO DOC 9896 ed2, based on EUROCAE ED137-B) for ground telephony and ground segment of the Air-Ground voice.

ATM-VoIP industrial standard (EUROCAE ED-137) is maintained and evolved over time to ensure that voice communication requirements are met. Transition towards VoIP is bringing interoperability. Cross-border aspects need to be addressed appropriately within the network perspective.

VoIP in ATM constitutes an essential part of Network Strategy Plan SO 8 - Sub-project 2 - VoIP implementation. This sub-project aims at an efficient use of Voice over Internet Protocol by harmonised and coordinated implementation for ground/ground and ground part of ground/air aeronautical communications, ensuring network benefits from VoIP implementation.

NOTE FOR MILITARY AUTHORITIES: It is the responsibility of each military authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the military authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to military authorities.

Applicability Area(s) & Timescale(s)

<table>
<thead>
<tr>
<th>Applicability Area</th>
<th>Timescales:</th>
<th>From:</th>
<th>By:</th>
<th>Applicable to:</th>
</tr>
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<tbody>
<tr>
<td>All ECAC States</td>
<td>Initial operational capability</td>
<td>01/01/2013</td>
<td></td>
<td>Applicability Area</td>
</tr>
<tr>
<td></td>
<td>Full operational capability</td>
<td>31/12/2021</td>
<td></td>
<td>Applicability Area</td>
</tr>
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</table>

Operating Environments

En-route, Network

References

European ATM Master Plan

<table>
<thead>
<tr>
<th>Of step -</th>
<th>- No OI Link -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enablers -</td>
<td>CTE-C05a</td>
</tr>
<tr>
<td></td>
<td>CTE-C05b</td>
</tr>
</tbody>
</table>

Legend: WXYZ-001 Covered by SLoA(s) in this objective
WXYZ-002 Covered by SLoA(s) in another objective
yyyy-003 Objective covering the enabler
WXYZ-003 Not covered in the Implementation Plan

Applicable legislation

- none-

ICAO GANP – ASBUs

- none-

Deployment Programme

3.1.4 Management of dynamic airspace configurations

Implementation Plan Edition 2018
### Stakeholder Lines of Action (SLoAs)

<table>
<thead>
<tr>
<th>SLoA ref.</th>
<th>Title</th>
<th>From</th>
<th>By</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM11.1-REG01</td>
<td>Conduct safety oversight of the changes</td>
<td>DELETED</td>
<td></td>
</tr>
<tr>
<td>COM11.1-ASP01</td>
<td>Develop safety assessment for the changes</td>
<td>01/01/2012</td>
<td>31/12/2021</td>
</tr>
<tr>
<td>COM11.1-ASP02</td>
<td>Notify to the Regulator the planned means &amp; date of Initial and Full Operational Capability</td>
<td>DELETED</td>
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</tr>
<tr>
<td>COM11.1-ASP03</td>
<td>Upgrade and put into service Voice Communication Systems to support VoIP inter-centre telephony</td>
<td>01/01/2013</td>
<td>31/12/2021</td>
</tr>
<tr>
<td>COM11.1-ASP04</td>
<td>Upgrade and put into service Voice Communication Systems to support VoIP links to the ground radio stations</td>
<td>01/01/2013</td>
<td>31/12/2021</td>
</tr>
</tbody>
</table>

Description of finalised and deleted SLoAs is available on the eATM Portal @ [https://www.eatmportal.eu/working/depl/essip_objectives](https://www.eatmportal.eu/working/depl/essip_objectives)

### Expected Performance Benefits

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Maintained or improved by providing enhanced signalisation functions. Improved by providing a more resilient infrastructure.</td>
</tr>
<tr>
<td>Capacity</td>
<td>Maintained or improved by providing enhanced signalisation functions.</td>
</tr>
<tr>
<td>Operational Efficiency</td>
<td>-</td>
</tr>
<tr>
<td>Cost Efficiency</td>
<td>Reduced costs by enabling flexible and dynamic use of ANSP resources, leading to long term savings.</td>
</tr>
<tr>
<td>Environment</td>
<td>-</td>
</tr>
<tr>
<td>Security</td>
<td>-</td>
</tr>
</tbody>
</table>

### Detailed SLoA Descriptions

**COM11.1-ASP01**

**Develop safety assessment for the changes**

From: 01/01/2012  
By: 31/12/2021

**Action by:** ANS Providers

**Description & purpose:** Develop safety assessment of the changes, notably upgrades of voice communication systems to support VoIP both for inter-centre telephony and AG radio communication. The tasks to be done are as follows:

- Conduct hazard identification, risk assessment in order to define safety objectives and safety requirements mitigating the risks;
- Develop safety assessment;
- Deliver safety assessment to the NSA, if new standards are applicable or if the severity class of identified risks is 1 or 2.

This safety assessment shall be based on fully validated/recognised method.

**Supporting material(s):**


EUROCONTROL - EAM 4 - ESARR 4 - Risk Assessment and Mitigation in ATM - Edition 1.0 / 04/2001

Url: [http://www.eurocontrol.int/articles/esarr-4-risk-assessment-and-mitigation-atm](http://www.eurocontrol.int/articles/esarr-4-risk-assessment-and-mitigation-atm)

**Finalisation criteria:**

1 - The Safety argument for all changes, generated by the deployment of VoIP, has been delivered by the ANSP to the NSA.

**COM11.1-ASP03**

**Upgrade and put into service Voice Communication Systems to support VoIP inter-centre telephony**

From: 01/01/2013  
By: 31/12/2021

**Action by:** ANS Providers
### Description & purpose:
Upgrade and put into service voice communication systems which support ED-137 compliant VoIP inter-centre telephony which will enable the deployment of system enablers listed in -References- section. The tasks to be done are as follows:

- Define requirements which fit with operational/technical context and are based on relevant standards;
- Upgrade voice communication systems to comply with defined requirements;
- Implement or purchase IP network services to enable international communication exchange on IPS based protocol;
- Purchase and install VCS equipment and/or gateways able to support VoIP in ATM;
- Implement the necessary IPv4/IPv6 translation device if required;
- Test voice required connectivity and performance;
- Update VoIP addressing and connectivity information in the EUROCONTROL AGVN web-database;
- Integrate upgraded voice communication systems into the operational network;
- Put into service upgraded voice communication systems.

The upgraded voice communication systems and their HMI shall enable the operators to perform the inter-centre communication using VoIP telephony at all types of ATS units.

Report yearly the actual achieved performance for implemented VoIP in ATM to the EUROCONTROL Agency.

**Note**: Completion of the finalisation criteria should be reflected by updating the VoIP connectivity information in the EUROCONTROL AGVN web-database.

### Supporting material(s):
- EUROCONTROL - Guidelines on Conformity Assessment for the Interoperability Regulation of the Single European Sky - Edition 3.0 / 02/2012
  - [Url](http://www.eurocontrol.int/publications/conformity-assessment-guidelines)
- EUROCAE - ED-137/2B - Interoperability Standards for VoIP ATM Components - Volume 2 Telephone 01/2012
- EUROCAE - ED-137/3B - Interoperability Standards for VoIP ATM Components - Volume 3 European Legacy Telephone Interworking 01/2012
- EUROCAE - ED-137/4B - Interoperability Standards for VoIP ATM Components - Volume 4 Recording 01/2012
- EUROCAE - ED-137/5B - Interoperability Standards for VoIP ATM Components - Volume 5 Supervision 01/2012
  - [Url](https://store1.icao.int/)
  - [Url](http://boutique.eurocae.net/catalog/index.php)
- EUROCONTROL - SIP v ATS-R2 Gateway Interworking Test Specification - Edition 2 / 12/2013
- EUROCONTROL - VOTER 3 0 3 baseline specification - Vol 3 - VCS Telephone ED137B compliance - ed 2.9 / 12/2014
- EUROCONTROL - VOTER 3 0 3 baseline specification - Vol 4 - Recorder ED137B compliance - ed 2.9 / 12/2014
- EUROCONTROL - VOTER 3 0 3 baseline specification - Vol 5 - Interoperability - ed 2.9 / 12/2014
- EUROCONTROL - VOTER 3 0 3 baseline specification - Vol 6 - Performance - ed 2.9 / 12/2014
- EUROCONTROL - VOTER Test Tool - version 3.0.5 - 2016
- EUROCONTROL - VoIP in ATM Cross-Reference Matrix - Edition 2.0 / 12/2013
  - [Url](https://ost.eurocontrol.int/sites/VOTE/Shared Documents/Reference Documents)

### ATM Master Plan relationship:
- [CTE-C05a]-VoIP for ground telephony

### Finalisation criteria:
1. Voice communications equipment has been upgraded.
2. The technical file (TF) with evidences of compliance and the EC declaration of verification of systems (DoV) has been delivered to the competent National Supervisory Authority (NSA).
3. Upgraded voice communication equipment has been put into operational service.

### COM11.1-ASP04
| Upgrade and put into service Voice Communication Systems to support VoIP links to the ground radio stations | From: 01/01/2013 | By: 31/12/2021 |

**Action by:**  ANS Providers
### Description & purpose:
Upgrade and put into service voice communication systems which support ED137 compliant VoIP links to the ground radio stations which will enable the deployment of system enablers listed in -References- section. The tasks to be done are as follows:

- Define requirements which fit with operational/technical context and are based on relevant standards;
- Upgrade voice communication systems to comply with defined requirements;
- Implement or purchase IP network services to enable international communication exchange on IPS based protocol;
- Purchase and install VCS and GRS equipment and/or gateways able to support VoIP in ATM;
- Implement the necessary IPv4/IPv6 translation device if required;
- Test voice required connectivity and performance including AG ground segment voice application;
- Updating VoIP addressing and connectivity information in the EUROCONTROL AGVN web-database;
- Integrate upgraded voice communication systems into the operational network;
- Put into service upgraded voice communication systems.

The upgraded voice communication systems shall enable the operators to perform A/G radio communication using VoIP links between VCS and ground radio stations.

Report yearly the actual achieved performance for implemented VoIP in ATM to the EUROCONTROL Agency.

**Note**: Completion of the finalisation criteria should be reflected by updating the VoIP connectivity information in the EUROCONTROL AGVN web-database.

### Supporting material(s):

<table>
<thead>
<tr>
<th>Material</th>
<th>Url</th>
<th>Date/Version</th>
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</thead>
<tbody>
<tr>
<td>EUROCAE - ED-137/4B - Interoperability Standards for VoIP ATM Components - Volume 4 Recording 01/2012</td>
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<td>4B</td>
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<tr>
<td>EUROCAE - ED-137/5B - Interoperability Standards for VoIP ATM Components - Volume 5 Supervision 01/2012</td>
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<td>5B</td>
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<tr>
<td>EUROCONTROL - SIP v ATS-R2 Gateway Interworking Test Specification - Edition 2 / 12/2013</td>
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<td>EUROCONTROL - VOTER 3 0 3 baseline specification - Vol 1 - GRS Radio ED137B compliance - ed 2.9</td>
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<tr>
<td>EUROCONTROL - VoIP in ATM Cross-Reference Matrix - Edition 2.0 / 12/2013</td>
<td>[<a href="https://ost.eurocontrol.int/sites/VOTE/Shared">https://ost.eurocontrol.int/sites/VOTE/Shared</a> Documents/Reference Documents](<a href="https://ost.eurocontrol.int/sites/VOTE/Shared">https://ost.eurocontrol.int/sites/VOTE/Shared</a> Documents/Reference Documents)</td>
<td>2.0 / 12/2013</td>
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<tr>
<td>EUROCAE - ED-136 - Voice over Internet Protocol (VoIP) Air Traffic Management (ATM) System Operational and Technical Requirements 02/2009</td>
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<tr>
<td>EUROCAE - ED-137/1C - Interoperability Standards for VoIP ATM Components - Volume 1: Radio</td>
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<td>EUROCONTROL - VOTER 4.0.x baseline specification - VOL 1 - GRS Radio ED-137/1C - ed 3.3</td>
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</tbody>
</table>

### ATM Master Plan relationship:

[CTE-C05b]-Digital Voice / VoIP for ground segment of Air-Ground voice

### Finalisation criteria:

1. Voice communications equipment upgraded.
2. The technical file (TF) with evidences of compliance and the EC declaration of verification of systems (DoV) has been delivered to the competent National Supervisory Authority (NSA).
3. Upgraded voice communication equipment put into operational service.