



International Civil Aviation Organization

Independent Oversight Task Force

Cost Allocation to Aviation

REPORT

First Meeting, Virtual, 15 March 2023

Second Meeting, Virtual, 31 March 2023

Third Meeting, Virtual, 6 April 2023

Fourth Meeting, Virtual, 18 April 2023

Fifth Meeting, Virtual, 1 February 2024

Views expressed herein should be taken as advice of the group of experts to the Secretary General, but not as representing the views of the Organization.

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Cost Allocation to Aviation

1. Establishment of the Independent Oversight Task Force

1.1 Pursuant to the work undertaken towards the establishment of a global cost recovery mechanism for the ICAO space weather information service, during the Third Meeting of the 227th Session held on 23 November 2022, the Council requested that the Secretariat present a proposal for the establishment of an independent oversight body (C-DEC 227/3 refers). As noted in the C-DEC 227/3, the purpose of the independent oversight body is “ensuring that the service provider cost allocated to aviation is reasonable”.

1.2 To expedite the work, a Group was formed, taking into consideration the required work to complete and the timeline to implement a cost recovery mechanism for the service, a number of experts from across various regions, served in a preparatory oversight capacity and provided their preliminary input in relation to the allocation documentation, as presented in the Appendices of C-WP/15447.

2. Terms of Reference

2.1 The work of the Oversight Task Force (OTF) will be guided by the following approved Terms of Reference (ToR):

- a) evaluate the technical merits and the reasonability of the justification supporting the costs allocated to aviation for both the Australia/Canada/France/Japan (ACFJ) and Partnership of Excellence for Civil Aviation Space Weather User Services (PECASUS) Consortia, as presented in C-WP/15447, Appendices A, B and C;
- b) provide an in-depth analysis and report of the assessment of the findings including appropriate recommendations to guide the Council in its decisions on the issue; and
- c) provide any other recommendations that could assist in the implementation of the project.

3. Secretariat

3.1 The Group was led by Joanna Zorbas, Joint Finance Officer of the Air Transport Bureau, who served as Rapporteur. Secretariat participation also included Jun Ryuzaki, Technical Officer, Meteorology Section of the Air Navigation Bureau. A comprehensive list of the Independent OTF Members is provided in **Appendix A**.

4. Meetings

4.1 The Group held five virtual meetings: 15 March 2023, 31 March 2023, 6 April 2023, 18 April 2023 and 1 February 2024. Maximum informality was maintained throughout, enabling the Task Force to complete its work in the communicated timeframe. Proceedings and all documentation were in English only. Service provider feedback to OTF enquiries were provided after the Second and Third meetings of the Group. A summary of each meeting discussion is contained in **Appendix B**.

Observations and Findings

5. General Observations

5.1 Cost allocation for each service provider Partner is determined independently at the Partner level, and consistency across Consortium Partners is challenging, as each Partner employs different cost accounting systems. Internal accounting processes, within each Partner organization, dictate how costs are recorded, analyzed, and reported. Also, Consortiums can include both private and governmental institutions, which operate in fundamentally different ways. Additionally, other organizational differences further impact these processes.

5.2 Some States or Partners adhere to an open data policy and conduct ongoing research, meaning certain observations are fully funded by local taxpayers and incur no cost allocation to aviation services and its users. Some Partners may provide highly specialized services tailored specifically to the aviation sector, whereas others may offer more generalized information and observations that serve a broader range of users.

5.3 When determining the allocation of services provided to the aviation industry and other business sectors, several key factors should be considered to ensure the process is fair, transparent, justifiable, reasonable, and reflective of the industry's actual usage of the service. Additionally, these considerations and the cost allocation method must be clearly documented to ensure consistent application each year and to provide a reliable audit trail for verification purposes.

6. Operational Structure and Information Sources

6.1 The Group requested clarification on the nature and origin of certain information sources used by Global Service Provider Partners. While **Appendix B** of C-WP/15447 outlines the cost components of Global Service Providers, additional specifics, such as whether a partner's operational structure includes multiple organizations or if the partner operates as a private or public entity, were not available.

6.2 Recommendation

6.2.1 Additional details on each Partner should be included in cost and cost allocation documentation, as well as in future Agreement/Arrangement Annexes. This information should specify each Partner's organizational structure, clarify whether they operate as a private or public entity, and outline their service capabilities. Additionally, any structural or operational changes must be promptly reflected in an updated Agreement/Arrangement Annex.

7. Redundancy

7.1 The PECASUS Consortium addressed concerns regarding potential redundancy, given the presence of multiple consortium members, within the same geographic area. This issue was further examined to determine if redundancy was factored into each member's cost determination. In response,

the Service Providers emphasized that some consortium members operate observation stations beyond their national borders to ensure the system's necessary global coverage. They clarified that maintaining multiple sites in critical, remote regions is not considered redundant; rather, it is a cost-efficient approach to system maintenance that preserves system integrity by providing a backup in case of site failure.

7.2 The Provider further noted that maintaining one or more sites in remote, critical regions is not seen as unnecessary redundancy but rather as a cost-effective strategy to enhance system availability and reliability. Leveraging the full capacity of modeling and data analysis methods is essential to achieve a deep understanding of product confidence levels, thereby supporting the generation of robust, consolidated advisories.

7.3 The ACFJ Consortium also addressed the issue of redundancy, noting that responsibilities within ACFJ are structured to minimize overlap, particularly in modeling capabilities. An exception is made in the field of radiation, where relying on two distinct radiation models is considered beneficial.

7.4 Recommendation

7.4.1 To improve clarity on the operational distinctions among Service Providers and Partners, each Partner's system contributions, roles, responsibilities, and other relevant details should be presented in a standardized format and style. Expanding these descriptions with greater detail and depth would also facilitate the execution of any future audits.

8. Work Division and the Operational Rotational Work Structure

8.1 The Group requested clarification from Service Providers regarding each Consortium's role within the rotational structure. Questions were raised about the need for continuous forecasting in the service model and the associated charges for maintaining active standby. Specific enquiries included how Partners internally allocate costs between space weather services and other activities within the operational rotation, how roles function within the overall Service Provider rotation, and how each Consortium operates as a unified entity to optimize resources and minimize costs associated with the number of Partners involved.

8.2 The rotation scheme was described as preventing any single center from operating continuously throughout a 24-hour period. Tasks and roles are managed within each center's normal working hours, with sequential handoffs aligning with the flow of time zones to maintain standard workday hours. Service Providers also noted that a thorough analysis had been conducted to ensure consistency in the underlying principles of the scheme.

8.3 Certain institutions offer specialized services, which can result in higher allocation percentages for specific providers. The OTF noted that a Partner, exclusively dedicated to serving only the aviation sector, may not be an economically efficient structure, as it limits opportunities to share costs with other sectors.

8.4 Recommendation

8.4.1 Recommendations regarding the service structure fell outside the specific scope of the OTF; rather, questions in these areas aimed to enhance understanding of the service provision as well as ensure that no undue cost would be added because of a potentially less than optimal service structure.

9. Cost Allocation Methods

9.1 Some Service Providers have adopted a direct costing approach, identifying specific costs directly attributable to the aviation sector, such as labor or equipment dedicated to this industry, and assigning allocation percentages for shared or common expenses (e.g., overhead) using a fair metric, such as hours worked. This chosen metric is clearly specified across sectors. Alternatively, some providers have implemented a proportional or activity-based costing approach, where costs are allocated based on the share of each activity driving these expenses, such as labor hours. A usage-based allocation system is also an option, in which costs are assigned according to the actual utilization of shared resources, reflecting each sector's percentage of total resource usage. Other cost allocation methods may also be applied.

9.2 The Service Providers note that the Partners have collaborated for over three years, allowing sufficient time to fully understand their total operational costs, the nature of these costs, and to refine an appropriate cost allocation structure.

9.3 Recommendation

9.3.1 Documentation included in the Agreement Annexes should specify the allocation methods used for each cost category. An example of additional disclosure to facilitate an audit process is shown in **Appendix C**.

10. Fair Allocation Between Various Industries

10.1 Some Service Provision Partners are outlining how costs are allocated across industries that use space weather services. One Partner, for example, has allocated one-third of the service cost to aviation, prompting questions about whether this allocation accurately reflects industry usage. Additional questions have arisen about whether all relevant sectors were considered in this determination and how the process ensures representation of all sectors, including the incorporation of emerging industries as necessary.

10.2 Recommendation

10.2.1 Service Providers should review their allocation to aviation annually to ensure that emerging industries are appropriately considered and factored into the allocation percentage as their service needs evolve or services become tailored to them. To support external audits or internal verification, an annual questionnaire can be distributed to Service Providers to gather insights on this and other relevant topics.

11. Consortium Partner is a New Organizational Structure

11.1 In response to an OTF question, a Partner noted that they were not initially established to meet ICAO specifications for space weather service provision; instead, they have utilized numerous pre-existing assets and human resources, effectively time-shared to optimize costs. This approach allows them to utilize existing resources to fulfill ICAO space weather service requirements.

11.2 Recommendation

11.2.1 No specific recommendation on this issue as the current service structure has been approved and established according to the requirements established and the audit conducted by the World Meteorological Organization (WMO).

12. Allocation to Aviation Questions to a Consortium Partner

12.1 A Service Provider was questioned about their comparatively high proportional cost allocated to aviation relative to other providers. In response, the provider offered a detailed explanation of the activity-based costing approach used to calculate and assign service costs specifically for aviation.

12.2 Recommendation

12.2.1 All Partners should briefly document their cost allocation methods for various services, beginning with a review of the appendix in C-WP/15447. Where information is lacking, they should enhance the description for each cost category, specifically detailing the process and criteria for allocating costs to aviation. Each partner should also confirm the continued applicability of this approach with an annual sign-off.

13. Cost for Research Work Related to Product Development

13.1 The OTF raised concerns about potential redundancy, noting that one Partner might be developing service capacities that already exist within another Partner's capabilities. In response, the Service Providers explained that the Consortium was established to leverage each Partner's unique expertise, ensuring each plays a distinct role in service provision. Certain modeling capabilities from prior applications did not fully meet the user requirements for civil aviation, and over the past three years, the costs of modifying this capability have been absorbed by the Service Providers.

13.2 To ensure consistent performance, further work by a single Partner is necessary to complete and optimize the High Frequency (HF) model. Since HF communication services at all Space Weather Centers rely on ionosonde data, which can be unreliable during storm events and offers limited spatial coverage, developing a system that incorporates additional information sources is essential for the future reliability of HF Communication (COM) services.

13.3 Recommendation

13.3.1 Research work should be conducted on a consolidated level to ensure the entire system benefits from output and knowledge gained from this activity. If the research work required is isolated to one Consortium Partner, or simply within one Consortium, the result of the research work should be made available to other Service Provision components. Furthermore, the nature and need for research work should be adequately documented in the annual cost and estimate information.

14. Infrastructure for the Service Provision

14.1 The OTF requested clarification regarding the infrastructure in place prior to the development of the current service structure. The Service Providers explained that meeting WMO audit requirements necessitated a baseline level of service capability. They specified that modifications or enhancements were made to align with Standards and Recommended Practices (SARPs) and Annex 3 requirements. Some Partners noted that they had to tailor their services accordingly. Additionally, Partners highlighted that the ICAO service has benefited significantly from extensive pre-existing expertise, research, activities, and assets in space weather.

14.2 Recommendation

14.2.1 If future operational changes are required due to updates in the SARPs, the associated costs for service modifications should be itemized separately in the first year, with clearly identified impacted cost areas.

15. Cyclical Nature of Sun Activity and Costs

15.1 Service Providers noted that the largest portion of system costs arise from continuous, near-real-time observation and monitoring functions, while the compilation and dissemination of advisories represents only a small fraction of the total costs. The cost estimates also account for the cyclical nature of solar activity, with historical evidence showing that extreme solar events can occur even during low-activity cycles. Although more advisories are typically issued during peak solar activity, the primary cost driver remains the monitoring of space weather phenomena, not the issuance of advisories.

15.2 Recommendation

15.2.1 Annual reporting should include the number of advisories issued throughout the year. If all Service Providers provide this information, it will enable an assessment of how much issuing advisories contributes to overall system costs. Understanding these cost drivers is important for developing an efficient and effective system.

16. Training Costs

16.1 The OTF raised questions regarding training costs and expressed concerns about the level of training charged by some Service Provider Partners. In response, it was noted that each Partner has different cost categories with varying allocations for aviation services. Given that international civil aviation is a new user group with distinct requirements, there is a significant ongoing need for training to ensure compliance and consistency among providers.

16.2 Service Providers emphasized that training needs encompass three key areas: radiation, HF communications, and Global Navigation Satellite System (GNSS). Although a considerable portion of training costs has been covered by the Service Providers during the free service period, staff turnover necessitates ongoing training. The complexity of advisories requires that staff remain well-informed about a wide range of products to effectively respond to detailed requests. Service Providers also identified an example of shared training exercises among Partners on GNSS and radiation.

16.3 Recommendation

16.3.1 Training is a cost component that could be optimized and potentially shared among partners. Each Consortium should communicate their training needs at the beginning of the year, and as necessary throughout, considering the possibility of combining training costs when skills and equipment are common across partners.

17. Quality Assurance

17.1 The OTF noted that the costs associated with this item should be commensurate with each Partner's role within the Consortium. Only those with a quality assurance role should incur these costs, while Partners without this role should only reflect service management costs, which the OTF believes should be lower than currently indicated in the cost estimates. The OTF also emphasized the importance of quantifying the total cost within the Consortium to assess its adequacy.

17.2 In response, the Service Providers explained that this cost category encompasses both quality assurance and service management, with the majority of costs related to service management activities, such as attending coordination meetings, ICAO Meteorology Panel (METP) meetings, and User Consultation meetings. For some Partners, this cost category also includes internal audit expenses. All Partners participate in coordination efforts and have a part-time manager who serves as the primary contact for their respective organization.

17.3 Recommendation

17.3.1 Refine the cost categories for clarity by distinguishing between quality control, service management, and administration. Communicate these distinctions to service providers to ensure

consistency in the costs allocated to each category. Consider optimizing the participation to coordination meetings such as the ICAO METP meetings to reduce the service management costs.

18. Administrative Overhead

18.1 According to the service providers, the inclusion or exclusion of items in this category is determined by each institution's accounting system, the number of users in the State where the provider operates, and the current service structure. Service providers have conducted due diligence to accurately report actual costs and establish appropriate allocations to aviation.

18.2 Recommendation

18.2.1 Since the costs are based on individual internal accounting systems, establishing and documenting admissible costs that are auditable can be challenging. Nonetheless, even when costs vary by partner, they should be clearly outlined in the final agreement, along with the applicable allocation rates for each Partner.

19. Clarity on the Actual Cost Elements

19.1 The Group emphasized the need for clarity in identifying which costs are included under the operational cost category to assess their reasonableness.

19.2 Recommendation

19.2.1 To ensure full transparency, the mechanism being developed should include a detailed breakdown of costs for annual audit purposes.

20. Conclusion

20.1 Considering the various perspectives shared throughout the OTF mandate, the group recommends that the Council carefully review all recommendations presented in this report and encourage Service Providers to proactively assess their cost allocation approaches and mechanisms before initiating the global cost recovery process. Conducting both an internal review at the individual Consortium level, and a collaborative review among all parties involved in the global cost recovery mechanism, will strengthen the reliability and fairness of cost allocations within the aviation structure. This will help ensure that the aviation industry is not cross-subsidizing other sectors, while also supporting a clear and justified allocation of costs to service provision.

20.2 Furthermore, Service Providers should enhance the documentation that is expected to form part of an Agreement to better allow for an annual audit of the costs in an effective manner. While recognizing the overall cost is composed and compiled from varying documentational sources and systems, this

complexity should be formatted in a concise and transparent manner to be informative while also facilitating an effective and efficient annual audit process.

20.3 An extensive review of the service structure was not conducted. While some enquiries regarding service structure and potential redundancies were raised, there was no evaluation of whether the current system exceeds the necessary requirements for effective and efficient service delivery or, if a streamlined service structure with reduced redundancy would expose the aviation industry to risks of service gaps in the event of equipment failure or other incidents that lack immediate backup access.

20.4 In conclusion, the cost allocation exercise has yielded logical explanations from the Service Providers, supporting the determination that a reasonably fair and equitable distribution of costs to the aviation industry has been achieved. However, the information presented in Appendices A and B of C-WP/15447 lacks the necessary detail, structure, and transparency required to confirm this assumption and for effective audits and future allocation reviews. When considering an Agreement or Arrangement inclusion, content enhancement is essential for continuous oversight and to strengthen the integrity of the overall cost allocation process.

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APPENDIX A
LIST OF OVERSIGHT TASK FORCE
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LIST OF OVERSIGHT TASK FORCE
MEMBERS**

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APPENDIX B
MEETING SUMMARIES**

Report on Discussions First Meeting – 15 March 2023

The Oversight Task Force (OTF) observed the historical background and the events that led to the allocation of meteorological costs for delivering space weather information services. It was noted that the significance of space weather impacts was widely recognized during the Meteorology Divisional Meeting in 2002. In 2011, the International Air Transport Association (IATA) formally requested the International Civil Aviation Organization (ICAO) to expeditiously implement an operational space weather information service.

Furthermore, it was brought to the Group's attention that, during the Fifth Meeting of the 213th Session held on 7 March 2018, the Council adopted the Standards and Recommended Practices (SARPs) for space weather information services as part of Amendment 78 to Annex 3 — Meteorological Service for International Air Navigation, with an effective date of 8 November 2018. These SARPs outlined the requirements for the provision of information on space weather.

The discussion also encompassed the structure of the space weather service providers, and their operational framework, as well as their position on cost recovery. The Group received pertinent Council Decisions pertaining to cost recovery to summarize the ongoing discussions and to emphasize the evolution of a cost recovery mechanism for service provision and the role of the OTF in this project work.

Report on Discussions Second Meeting – 31 March 2023

The Group discussed the context of the initial questions and clarifications sought on the cost allocation details provided by the Service Providers. Concerns were raised regarding the role of each centre with a focus on redundancy of services predominately related to Consortium members from the same geographic area.

The Group also voiced the need for clarification regarding the variations in percentage allocations between service centers. It was recognized that different accounting systems and operational cost components might be contributing factors requiring more detailed information.

Additionally, the Group was informed that their comments and questions would be relayed to the Service Providers, and the responses gathered would be shared with the Group.

Report on Discussions Third Meeting – 6 April 2023

Prior to the Third Meeting of the Task Force, the Service Providers provided written responses to the clarifications sought by the Task Force. They also participated in the Third Meeting to elaborate on their responses and to allow for a real time discussion. This approach allowed for timely follow-up inquiries and responses to additional questions raised by the Task Force Group, as necessary.

Participating Service Providers:

David Boteler (ACFJ)

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Head of the Space Weather Group,
Natural Resources Canada

Jaakko Nuottokari

Director, Customer Services Unit,
Finnish Meteorological Institute

Kari Österberg

Chief Operating Officer of PECASUS Space Weather Service
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Dr. G.H.J. (Bert) van den Oord

Coordinating Advisor R&D Satellite observations Royal Netherlands Meteorological Institute (KNMI)

The Service Providers provided the rationale behind the various percentage allocations applied to their service. The key focus in this discussion was on considering the varying accounting systems behind the complied costs and the importance of benefits in maintaining a consistent level of descriptive details to ensure clarity and transparency. This was done while seeking a reasonable level of assurance that the allocation methodology would be fair and equitable to all stakeholders.

Another clarification was requested about redundancy in terms of observation areas, specifically applicable to Partnership of Excellence for Civil Aviation Space Weather User Services (PECASUS), as the Consortium members are from the same geographic area. The Service Providers emphasized that the Consortia was established based on the unique expertise of each partner. They clarified that each Provider played a distinct role in delivering the service and maintaining observation stations at multiple locations, including remote ones, outside of their own territories. They asserted that this approach wasn't redundant but a cost-effective solution ensuring high reliability and availability of measurements.

Additional clarifications were requested concerning the various operational cost components, training requirements, percentage cost allocations for aviation, and the impact of new service users. The Service Providers also highlighted that continuous observations were the primary cost driver to the service with advisories having a less significant impact on overall costs.

To address concerns about possible redundancies, PECASUS provided further information about the provisions of the service and role of each member. This was done to determine whether the number of observation capabilities had been optimized effectively.

Report on Discussions Fourth Meeting – 18 April 2023

The meeting focused on determining the nature of the recommendation(s) to be issued, in consideration of the overall project and an assessment, or evaluation, of overall reasonableness, fairness, and transparency in allocation.

The discussion also covered the importance of service providers reassessing cost allocations in the future, especially if there are changes in the service structure within the consortium or with the addition of a new service provider. Emphasis was placed on recognizing that the allocation of service costs is an ongoing process rather than a static one, as highlighted by its inclusion as an Annex to the Arrangement. Furthermore, it was acknowledged that Annexes to Agreements or Arrangements can be readily and regularly amended.

The Group also noted that considerations for a required audit trail underscore the necessity of clear formatting and presentation in the detailing of the cost allocation for each category. The information within the Annexes of the Agreement/Arrangement must encompass all necessary details and explanations essential for supporting the audit process and aiding oversight groups in their work. It is crucial to modify the structure in the final Agreement/Arrangement to enable a streamlined audit process, as minimizing administrative costs is paramount. Simplifying and making the Annexes more auditable would significantly facilitate the process, ensuring smoother operations and ease of understanding for all involved parties.

The Group raised the question of whether they could additionally propose enhancing the Service Providers' mechanisms or processes. This suggestion aims to ensure that the service is delivered in the most cost-efficient manner, particularly concerning the optimization of the observation network's operations and pertains to identifying who operates where and how many capabilities exist to provide similar information, in a given area. Once these aspects are clear, the goal is to assess if further optimization is viable for the observation network, focusing not just on cost recovery but also on enhancing operational efficiency. The Air Navigation Bureau (ANB) highlighted that operational aspects would be covered in the Meteorology Panel (METP) discussions. According to the Oversight Group's summary, the resulting recommendation might encompass two facets: one, involving a review of the cost recovery mechanism after a year of operation, and another aimed at optimizing operations efficiently, minimizing unnecessary overhead. Since this marks the initial consideration of how operations impact costs, it is rational to contemplate integrating operational aspects into the broader cost framework. Recommendations forwarded to the Meteorological Operations Group (MOG) would thus seem reasonable. The Group further noted that it is crucial that addressing structural issues need not necessarily wait until 2027. The ICAO Secretariat stressed that any contributions to working papers related to the Group's work must receive clearance from the Group before submission.

The Group will determine and confirm the date for the final meeting. The final report will be collectively agreed upon through correspondence following the conclusion of the Group's final meeting.

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MEETING SUMMARIES**

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Report on Discussions Fifth Meeting – 1 February 2024

The Group observed delays in receiving feedback on several questions submitted to the Service Providers. These delays were partly attributed to recent changes in focal points and shifts in work responsibilities. Some questions remain unanswered, and several responses received show inconsistencies between the answers and the information in the Service Provider’s report. To resolve these issues, and gather the information necessary to reach a conclusion, the Group scheduled further follow-up through targeted email inquiries.

The Group was reminded that its discussions, summarized findings, and recommendations on the documentation provided by the Service Providers will largely be prepared for inclusion in an Appendix to a forthcoming Agreement/Arrangement. The Group noted the technical complexity of the information presented and identified potential gaps in the required details, such as the absence of specific cost figures. Recognizing the novel nature of the Arrangement, the Group highlighted process-related issues that may be worth documenting. Additionally, the Group suggested that providing the Service Providers with a template could streamline the presentation of cost information in a format suitable for auditing.

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APPENDIX C
COST ALLOCATION DISCLOSURE

Extract from C-WP/15447, presented during the Third Meeting of the 227th Session of the Council, with the added content of the yellow labelled columns.

7.1 The cost shares of aviation space weather training from all space weather training per institute, are listed in Table 14*. Training costs include costs for the training of new forecast staff as qualified Space Weather forecasting personnel and ongoing training for operational staff as well as training for local aviation customers.

Table 14: Cost of SWX training costs allocated to global civil aviation per consortium and partner (%)

Ref.	PECASUS	Allocation % to Aviation	Ref.	ACFJ	Allocation % to Aviation
1	FMI	33 %	10	NRCAN	35 %
2	KNMI	0 %	11	ABOM	11%
3	UKMO	10 %	12	NICT	0%
4	DLR	22 %	13	SPECTRA	95%
5	STCE	30 %			
6	SRC	0 %			
7	SL	65 %			
8	INGV	30 %			
9	FU	0 %			

Table 15: Justification for the allocation to global civil aviation in Table 14

Ref.		Justification for the allocated percentage used	Direct Allocation Method	Proportional Allocation	Usage Based Allocation	Other
1	FMI	Costs are allocated based on the direct costs (share of the working hours allocated to global SWX services to civil aviation). The allocation is based on the data from the accounting system of FMI from the years 2020 & 2021.	Verify and document hours allocated.			
2	KNMI	In the past KNMI helped setting up these trainings, currently STCE provides these trainings. For training local aviation customers, no charge is asked because it is a task of KNMI as a national service provider and the cost is negligible				
3	UKMO	Forecaster training assumes one hour of training per year per forecaster			Compute one hour per forecaster.	

*Table reference mislabelled as Table 32 in C-WP/15447

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COST ALLOCATION DISCLOSURE

Ref.		Justification for the allocated percentage used	Direct Allocation Method	Proportional Allocation	Usage Based Allocation	Other
4	DLR	Same as in section 1.0		Verify direct working percentage allocation. Estimated costs for services over the current total annual budget (for pre-operational services).		
5	STCE	Only internal training is counted. External training, such as training to customers is not included here. Trainings to customers are provided at a cost to the customer. The cost charged to aviation is calculated as a share of the overall cost in this category.		Verify that 30% of the total cost is applied.		
6	SRC	-				
7	SL	Includes all costs related to trainings. The share to this project is between 50% and 80% depending on economic situation.	Verify support for the applied allocation.			
8	INGV	Additional continuous training is needed for the management of observing infrastructure and for the analysis and modelling capability			Verify the percentage allocation to aviation.	
9	FU	-				
10	NRCAN	General training (for field work, computing, etc.) is obtained from external providers and online courses. This is shared by earthquake and space weather with 50% for space weather and one third of that for aviation, so 16.6% is allocated to aviation. Special training in space weather is provided through conference attendance and 33% of those costs are allocated to aviation. Salaries for staff while on training are counted under the activity for which training is needed.		Verify that 16.6% of the total cost is applied.		

*Table reference mislabelled as Table 32 in C-WP/15447

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COST ALLOCATION DISCLOSURE

Ref.		Justification for the allocated percentage used	Direct Allocation Method	Proportional Allocation	Usage Based Allocation	Other
11	ABOM	ACFJ carries out annual training exercises to test its internal aviation space dissemination chain and provide a refresher to current and potential new forecasters on the service. Any major updates in software and forecasting procedures also require a mini test to be carried out amongst the forecasting team. The annual exercise usually runs for 48 hours and a significant amount of time goes towards planning and configuring the system to run these exercises. The total cost of the Australian space weather service has not been ascertained.	Verify total cost.			
12	NICT	Training costs for NICT are borne by regular budget and no cost allocated to aviation.				
13	SPECTRA	The space weather forecasters that operate the service get dedicated training provided through external institutes, with the costs related to travel and subsistence during the training period. Internal trainings are also provided to the technical operators which are not Space Weather experts.		Verify the reasonability and consistency of the proportion applied to aviation.		

IOTF-Report
APPENDIX D
SERVICE COST INFORMATION

State	Institutions	Estimated costs per annum (USD) ¹		% Aviation
		Full Space Weather Service	Aviation-related Space Weather Service	
PECASUS				
Finland	Finnish Meteorological Institute	3,745,000	824,042	22%
Netherlands	Royal Netherlands Meteorological Institute	947,000	179,913	19%
United Kingdom	UK Met Office	2,296,000	68,894	3%
Germany	The Deutsches Zentrum für Luft- und Raumfahrt	1,392,000	306,246	22%
Belgium	Royal Observatory of Belgium, Royal Meteorological Institute and Royal Belgian Institute for Space Aeronomy	2,847,000	564,301	20%
Poland	Space Research Centre of the Polish Academy of Sciences	1,047,000	327,785	31%
Austria	Seibersdorf Laboratories	514,000	334,490	65%
Italy	National Institute of Geophysics and Volcanology	1,110,000	313,152	28%
Cyprus	Frederick University	94,000	17,041	18%
Sub-Total		13,992,000	2,935,864	21%
ACFJ				
Australia	Australian Bureau of Meteorology ²	6,753,136	742,845	11%
Canada	Natural Resources Canada	5,081,618	1,249,960	25%
France	Collecte Localisation Satellite, European Satellite Services Provider, Météo-France	1,727,502	1,641,127	95%
Japan	National Institute of Information and Communications Technology	3,000,000	20,700	1%
Sub-total		16,562,256	3,654,632	22%
Total Cost_{SWXC}		30,554,256	6,590,496	22%

— END —

¹ Costs reflect 2023 operational cost estimates as provided by the Service Providers for inclusion in C-WP/15447, presented to the Council during the 227th Session in November 2022.

² Australian Service Provider costs were only available subsequent to the issuance of C-WP/15447.