

INTERGOVERNMENTAL OCEANOGRAPHIC  
COMMISSION (OF UNESCO)

---

WORLD METEOROLOGICAL ORGANIZATION

---

**Argos JOINT TARIFF AGREEMENT**  
**THIRTY-FIFTH MEETING**

Geneva, Switzerland, 26-28 October 2015

JTA-35 record of decisions



**JTA-35 group photo, Geneva, Switzerland, 26 October 2015**

*(from left to right: Scott ROGERSON, Gilbert EMZIVAT, Johan STANDER, David MELDRUM, R. VENKATESAN, Tom GROSS, Birgit, KLEIN, Etienne CHARPENTIER, Eric LOCKLEAR, Yann BERNARD, Gillan LICHOTA, Holly LOURIE, Salim JAVED, Ting YU, Shouhua LIU)*

INTERGOVERNMENTAL OCEANOGRAPHIC  
COMMISSION (OF UNESCO)

---

WORLD METEOROLOGICAL ORGANIZATION

---

**Argos JOINT TARIFF AGREEMENT**  
**THIRTY-FIFTH MEETING**

Geneva, Switzerland, 26-28 October 2015

**RECORD OF DECISIONS**

## **NOTES**

### **WMO DISCLAIMER**

#### **Regulation 42**

Recommendations of working groups shall have no status within the Organization until they have been approved by the responsible constituent body. In the case of joint working groups, the recommendations must be concurred with by the presidents of the constituent bodies concerned before being submitted to the designated constituent body.

#### **Regulation 43**

In the case of a recommendation made by a working group between sessions of the responsible constituent body, either in a session of a working group or by correspondence, the president of the body may, as an exceptional measure, approve the recommendation on behalf of the constituent body when the matter is, in his opinion, urgent, and does not appear to imply new obligations for Members. He may then submit this recommendation for adoption by the Executive Council or to the President of the Organization for action in accordance with Regulation 9(5).

© World Meteorological Organization, 2015

The right of publication in print, electronic and any other form and in any language is reserved by WMO. Short extracts from WMO publications may be reproduced without authorization provided that the complete source is clearly indicated. Editorial correspondence and requests to publish, reproduce or translate this publication (articles) in part or in whole should be addressed to:

Chairperson, Publications Board  
World Meteorological Organization (WMO)  
7 bis, avenue de la Paix  
PO Box No. 2300  
CH-1211 Geneva 2, Switzerland

Tel.: +41 (0)22 730 84 03  
Fax: +41 (0)22 730 80 40  
E-mail: [Publications@wmo.int](mailto:Publications@wmo.int)

### **IOC (OF UNESCO) DISCLAIMER**

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariats of UNESCO and IOC concerning the legal status of any country or territory, or its authorities, or concerning the delimitation of the frontiers of any country or territory.

---

**C O N T E N T S**

<b>RECORD OF DECISIONS</b> .....	1
<b>Annex I</b> List of participants.....	17
<b>Annex II</b> Agenda .....	20
<b>Annex III</b> Report of the 13 <sup>th</sup> meeting of the JTA Executive Committee (JTA EC-13).....	22
<b>Annex IV</b> Abridged report of the 12 <sup>th</sup> meeting of the JTA Executive Committee (JTA EC-12).....	25
<b>Annex V</b> Report by the JTA Chairperson to the 49 <sup>th</sup> meeting of OPSCOM.....	32
<b>Annex VI</b> List of actions.....	34
<b>Annex VII</b> Report on the 2015 Agreement.....	38
<b>Annex VIII</b> Report on 2014-2015 operations and system improvement .....	50
<b>Annex IX</b> Review of the structure of the Tariff Agreement and related matters.....	91
<b>Annex X</b> Terms and Conditions of the Global Agreement for 2016.....	97
<b>Annex XI</b> Argos Joint Tariff Agreement operating principles.....	101
<b>Annex XII</b> National reports on current and planned programmes .....	131
<b>Annex XIII</b> List of Representatives of Country (ROCs) for Argos .....	132
<b>Annex XIV</b> Joint Tariff Agreement Executive Committee budget.....	136
<b>Annex XV</b> Feedback from the 2014 national reports, and CLS response.....	137
<b>Annex XVI</b> Overview of the JTA.....	140
<b>Annex XVII</b> JTA vision and mission .....	142
List of acronyms and other abbreviations.....	143

*[this page left blank intentionally]*

## RECORD OF DECISIONS

### 1. INTRODUCTION

1.1 The Chairperson of the Argos Joint Tariff Agreement (JTA), Mr Eric Locklear (USA), opened the thirty-fifth session of the JTA at 0900 hours on Monday, 26 October 2015, at the headquarters of the World Meteorological Organization (WMO) in Geneva, Switzerland.

1.2 The JTA scheme has served as a robust example of international cooperation for about 35 years. It continues to provide an effective, pragmatic, self-governing global forum through which users' needs are presented, reviewed, and carried forward in a constructive dialogue with CLS. As such, it may serve as a model for similar arrangements that may in due course be established with other service providers.

1.3 As in previous years, the report of the JTA-35 Session covers the following topics<sup>1</sup>:

- Introduction;
- Actions and decisions of past meetings with review status;
- Action sheet of this Meeting, with records of necessary information and decisions;
- Records of formalities, including elections and decisions for the next Meeting;
- Annexes containing all necessary supplementary information.

1.4 Mr Locklear led the Meeting. Many participants subsequently assisted Mr Locklear and the secretariat in the production of this report.

1.5 Mr Locklear opened the session by thanking the WMO for hosting the Session. Mr Locklear emphasized that the JTA should be an opportunity for engaging dialogue as well as the more formal aspects of the session. Decisions should be a result of the dialogue and not prepared prior to the session in the absence of broad discussion.

1.6 After discussion, it was agreed to adopt the provisional agenda as originally proposed.

1.7 The list of participants and the agenda are reproduced as **Annex I** and **Annex II** of this report respectively. 14 participants, including 8 Representatives of Country (ROCs) and Responsible Organizations (ROs), attended the Meeting.

### 2. REPORT OF THE CHAIRPERSON OF THE JTA

#### 2.2 Overview of the JTA

2.2.1 The Chairperson, Mr Locklear provided an overview of the JTA, including background information on its establishment, the conditions under which it is operating, and the benefits to Argos users. The JTA overview is provided in **Annex XVI**.

#### 2.3 Report on the JTA Activities during the intersessional period, including report of the JTA Executive Committee

2.3.1 The Chairperson presented report on actions taken by himself and the 12<sup>th</sup> Session of the JTA Executive Committee (JTA-EC) since, and resulting from the Thirty-Fourth JTA meeting.

2.3.2 During the intersessional period, the Chairperson attended two meetings on behalf of the Argos JTA; the International User Conference on Argos Wildlife Applications (IUCAWA) in

---

<sup>1</sup> The format of the report was decided at the 28<sup>th</sup> Meeting (2008) and noted in the JTA Operating Principles. As in the case of previous meetings, the report will be available online via the JCOMM website.

Baltimore, Maryland in November of 2014, and the 49<sup>th</sup> Meeting of the Argos Operations Committee (OPSCOM) in St. Emilion, France in June of 2015. The minutes of the Chairperson's report are included in **Annex V**, and a summary of the IUCAWA meeting is below.

2.3.2 On November 18th, Jean-Yves Legall, President of the French Space Agency, Marc Cohen, EUMETSAT, Mangesh Sannala, the Space Counselor at the Indian Embassy in Washington, DC, and Francisco Werner, Science and Research Director at the National Oceanographic and Atmospheric Administration (NOAA); representatives from the four space agencies that manage the Argos system (CNES<sup>2</sup>, NOAA, EUMETSAT<sup>3</sup> and ISRO<sup>4</sup>) opened what would end up being an outstanding user conference conceived by Bill Woodward of CLS America that showcased the scientific endeavors made possible by the Argos system.

2.3.3 Ms Gillian Lichota (CLS America) provided an overview of the outcome of the IUCAWA. The conference was a unique event that brought together scientists from diverse backgrounds, with a wide range of research interests, specializing in all taxa and species, from countries around the world. The scientists were genuinely pleased to share their research with each other, and the passion they have for their work was contagious. Major messages that came across were the universal concern these scientists have for our planet, and how essential the Argos system is to their discoveries, and to making the case for implementing conservation measures. The meeting agreed that it would be useful if another conference could be organized in the near future.

2.3.4 The meeting noted that the Global Ocean Observing System (GOOS) has a potential interest in marine animal tracking activities. The meeting agreed that efforts should be made to invite and inform the GOOS into the dialogue established between Animal telemetry and the US Integrated Ocean Observing System (IOOS) (from IUCAWA) (**action; JTA; ongoing**).

2.3.5 Prof. David Meldrum (United Kingdom) reminded the meeting that the animal tracking community were not bound exclusively to Argos for telemetry, and already made innovative use of other channels, both satellite and terrestrial. Many of these applications had been discussed at the Bio-logging Science Symposium (Strasbourg, 2014), which Prof. Meldrum had attended as interim Satcom Forum chair. Prof. Meldrum had encouraged the community to become better organised so that they might more effectively negotiate their telemetry needs, not only at the Argos JTA, but also at the emerging Satcom Forum. In response, the community agreed to establish an International Bio-Telemetry Society that could represent its telemetry needs and support delegate attendance at the relevant fora. The meeting also asked that future Argos JTA sessions be aligned more closely to animal-tracking conferences so as to encourage a wider participation of its members, who were now well established as the major user group for Argos.

2.3.6 The meeting agreed that JTA-36 should propose a new structure of the JTA assuring proper governance, and user representation (**action; JTA-36; JTA-36**).

2.3.7 The Twelfth meeting of the JTA Executive Committee (JTA-EC-12) was held in Silver Spring, Maryland, USA, from 15 to 17 July 2015. The abridged report of JTA EC-12 is provided in **Annex IV**.

### **3. THE Argos JTA PROPOSED STRATEGY FRAMEWORK**

3.1 Mr Johan Stander (South Africa) reported on the development of the proposed template for a JTA strategy as advised by the JTA Executive Committee. He gave JTA members background to the methodology and reasoning behind the concept with the aim of keeping the WMO and IOC in mind as guiding principles. The idea is that the strategy should in future be used to assist JTA to assess their progress and performance with regards to long term vision and key performance indicators.

---

2 Centre National d'Etudes spatiales (France)

3 European Organization for the Exploitation of Meteorological Satellites

4 Indian Space Research Organization



3.2 The meeting agreed on the need for a JTA Vision and Strategy for the foreseeable future. The meeting developed a Vision for the JTA in 2020 to be then used for developing the strategy document. The agreed upon JTA Vision is provided in **Annex XVII**.

3.3 The meeting reviewed the template, proposed some adjustments (Vision and mission statement added). The strategy template is now structured as following:

1. **Introduction** (*incl. Vision and Mission*)
2. **Operating context of the JTA**. This section should be defining the benefits of the JTA, and explain about the mandate and scope of the JTA. It should be reviewing partnerships and alliances, including how to move towards a comprehensive collaborative framework, and to better engage stakeholders. Financial considerations should also be included in this section (operational expenditures, capital expenditure requirements, and options for anticipating funding outcomes). Finally the section should be addressing opportunities and provide details on human capacities in support of the JTA.
3. **JTA Strategic drivers and strategy for the period 2016 to 2020**. This section should be defining the strategic drivers and their implications, the strategic goals and objectives.
4. **Programme of action for achieving the strategic objectives**. This section should be proposing current priorities, explain current JTA related activities compared to the ideal (strategy-based) activities, and propose a programme of action, including key performance indicators and targets for each year on the basis of a 2015 baseline.
5. **Implementation considerations**. This section could for example include the definition of a framework of accountability.
6. **Conclusion**

3.4 The meeting requested the JTA Executive Committee to develop the strategy document according to the template, in the view to submit it to the next Session of the JTA in 2016 (**action; JTA-EC; JTA-36**).

#### 4. FEEDBACK FROM THE 2014 AND 2015 NATIONAL REPORTS

4.1 The meeting stressed again on the importance of the national reports and feedback from the Argos users in order to ensure the users' needs are completely taken care of by the members of the JTA.

4.2 The meeting recalled its request to CLS to address issues arising from the 2014 national reports. CLS therefore reported on its actions to answer issues from Canada, China, Germany, India, New Zealand, and Spain as mentioned in the section 4 (*User issues, problems, and level of satisfaction with Argos*) of the 2014 Argos JTA National reports. Examples of issues of concern identified in National reports included: additional training was requested; and more flexible payment schedules were requested. The responses of CLS are provided in **Annex XV**.

4.3 The meeting invited the ROCs to relay the CLS feedback on the national reports to the national users, and to invite them to make use of the CLS customer care service (**action; ROCs; JTA-36**).

4.4 The meeting also reviewed feedback from the 2015 national reports available at the time of the Session, and took them into account for the subsequent discussions. Reports were submitted by Australia, China, Germany, India, the Netherlands, New Zealand, South Africa, Sweden,

Switzerland, the United Arab Emirates, and the United States of America. Some additional issues from the national reports were noted, which CLS was once again requested to address, and to report feedback at the next JTA Session (**action; CLS; JTA-36**). See also item 10.

## 5. REVIEW OF THE 2015 GLOBAL AGREEMENT

5.1 Mr Yann Bernard (CLS France) presented a report on activity within the 2015 Global Agreement. The full report, given in **Annex VII**, is summarised below:

### OVERALL USAGE TRENDS

5.2 CLS reported on the Argos usage activity in 2014, which was the last year of the five Year Plan 2010-2014. Figure 1 below shows the actual usage evolution over the past five years in term of number of active Platform Transmitter Terminals (PTTs) and corresponding consumption (PTT-year<sup>5</sup>) compared to the initial plan worked out in 2009.

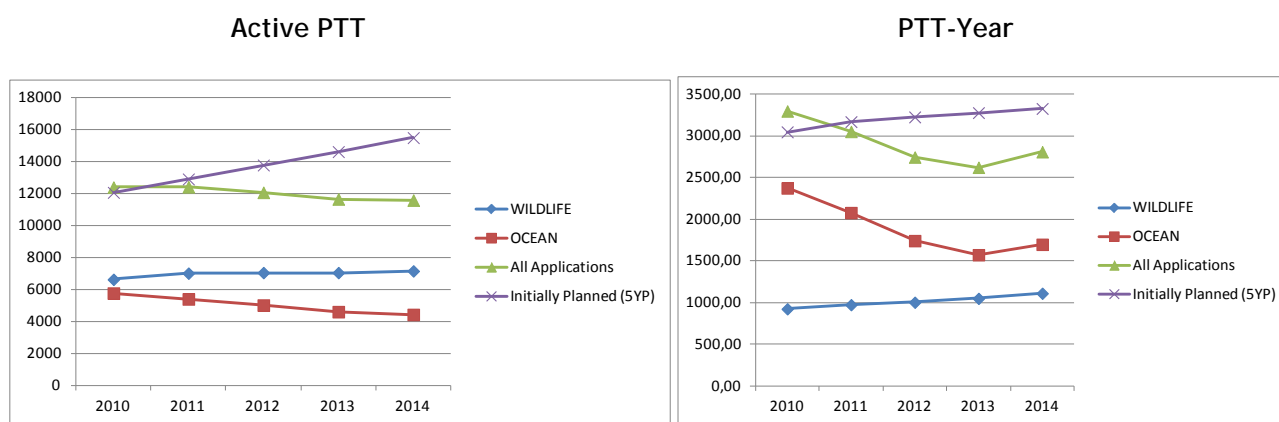


Figure 1: 2010-2014 actual activity and consumption

Overall, the active PTTs and thus the total number of transmitters in the field and corresponding consumption have slightly decreased compared to 2013, with a continued negative trend since 2012 levels. The total number of PTT-Years has slightly increased in 2014 compared to 2013 (while it was decreasing before 2013), in part due to an increase in the number of PTT-Years for ocean observing platforms. Wildlife tracking applications continue their steady growth in terms of PTT-Years.

5.3 The JTA noted that the core of the Argos system activity is increasingly with the animal tracking community.

### TIME SLOTS and 12 DAY CAPPING

5.4 Further to JTA-27 decision the consumptions for animal platforms are capped at 12 day-units (48 time slots). These features of the tariff have been used extensively by users in order to decrease Argos costs, as recommended during JTA-27 to JTA-29.

5.5 The Argos platforms transmitting under the category “Animals and Subsurface floats” have benefited from the time slot accounting since 2005. Those transmitting under the “Buoys & Others” and “Fixed Stations” category started benefiting from the time slot accounting in 2007. Those transmitting under the “Animals” and “Sub Floats” categories are significantly benefitting from the time slots: As an average the platforms transmitting under the “Animals” category are only transmitting 41% of the day and the ones transmitting under the “Sub Floats” category are

5 Equivalent to a PTT reporting in every time-slot during one year

transmitting 49% of each transmitting day. Buoys are transmitting 94% of the day and Fixed Stations 96% since they transmit data continuously throughout the day.

5.6 In 2014, 904 PTTs (average active PTT per month) took advantage of the capping, representing 207.30 PTT-year. The number of animals taking advantage of the capping is increasing by 7% in 2014 and more particularly “Birds and Marine animals”.

#### INACTIVE STATUS<sup>6</sup>

5.7 As stated in the Terms and Conditions of the Global Agreement, this status is intended for those platforms that continue to transmit but for which the location or data collection are of no further use to the user or the community. The following conditions must be met to qualify:

- (1) *Inactive Status will apply if, and only if, Inactive Status is declared by the signatory of the System Use Agreement for platforms, which continue to transmit beyond the programme termination. In that case, further charges will no longer be levied.*
- (2) *The platforms must have operated in Basic Service for a minimum of 2 months.*
- (3) *Data or location information cannot be retrieved nor can the platform revert to any category of service.*
- (4) *It is intended that Location and/or data collection may not be computed using a Local User Terminal or other direct readout facility.*
- (5) *ID numbers of such platforms are actually returned to CLS who will recycle them after the platform stops transmitting.*

5.8 The JTA noted that in 2014 the number of IDs processed under Inactive status continue to grow: **464 PTTs** (418 in 2013), and are counted every month representing **125 PTT-year** (114.77 in 2013).

5.9 The meeting recalled that these PTTs which are unused but are still transmitting are increasing the system occupancy. CLS keeps highlighting this to the users and manufacturers encouraging them to program their PTTs only for the duration of the experiment.

5.10 The meeting noted that the decrease of the large programmes may happen faster than anticipated in the FYP 2015-2019 (e.g. 900 active PTTs for the “Large programme buoys & others” in 2018 should be more in the order of 300). It was noted that 2016 is the first year when the transition of such programmes could happen. The legacy platforms may also smooth the transition. Also the soon availability of the Argos Chipset may offer new opportunities that are not clearly identified yet. The meeting noted that actual Argos usage changes as compared to the FYP can be taken into account by (i) encouraging CLS to adjust the Argos operating costs accordingly, or (ii) introducing adjustments to the tariff. For this reason, the meeting agreed that the JTA must be able to monitor changes regularly (i.e. yearly). The following Five Year Plan (FYP) (i.e. as of 2020) will probably be dramatically different from the current one.

## **6. REPORT ON THE DEVELOPMENT AND OPERATIONS OF CLS**

### Argos OPERATIONS AND SYSTEM IMPROVEMENTS

6.1 Mr Bernard presented reports on Argos operations and system improvements during 2014-2015. The JTA recalled that Argos is a global satellite-based location and data collection system

---

<sup>6</sup> Recall: since year 2004, transmissions from Inactive IDs are no longer charged.

dedicated to studying and protecting our planet's environment. CLS, as a unique operator of the Argos system on behalf of NOAA, CNES, EUMETSAT and ISRO, continues to maintain and improve a high operational service for all Argos users, especially for the meteorological and oceanographic community.

6.2 Mr Scott Rogerson (USA) described the status and future of the Argos satellite constellation and commented on the effect of different satellite attributes on the coverage and timeliness of Argo data transmission.

6.3 Operations highlights from the last 12 months include:

- Improvements of the Argos antenna network (6 global in the Northern Hemisphere, and one in Antarctica), including improved regional antenna network (63 now operational). 3 stations have been upgraded in 2015 (for full Argos constellation compatibility). 3 new stations have also been established in the South Atlantic (Ascension Island, and Libreville in Gabon) and South Pacific (Easter Island). These improvements allow substantial improvements in Argos mean data disposal times, particularly in problematic areas that had been identified by the DBCP (South Atlantic, South Pacific).
- Major upgrade of CLS and CLS America system infrastructure.
- Implementation of FTPS in compliance with NWS new premises security requirements for the Global Telecommunication System (GTS).
- CLSView for the Android smartphone application is available to users.

6.4 The meeting noted the following outlook for ongoing and future developments:

- A new antenna will be installed in Kourou (French Guyana). 8 stations will also be upgraded. This will allow to further improve data availability delays globally.
- Possibility will be given to users to reprocess online Argos Doppler locations from 1/1/2008.
- A new Argos Location Quality Monitoring Component will be implemented to better control the quality of the Argos Doppler location system.
- A new ArgosWeb user interface and cartography systems entirely redesigned with new services, and upgraded functionalities would be available from early 2016
- The new Argos Chipset (SHARC<sup>7</sup>) will be providing Argos-2/3/4 RF module on a single chipset. It will provide both uplink and downlink transmission. An evaluation kit will be available in early 2016.
- METOP-C should be providing Argos-3 capability as of 2018.
- Argos-4 will provide larger bandwidth (640 KHz) with specific frequency bands for low output transmitters (like animal tags), higher sensitivity of the space instrument, and improvements of the data collection using new high data rate platforms (PMT-HDA4 : 4800 bps with link budget reinforced by 3 dB). OceanSat-3 is planned to be the first satellite carrying Argos-4 capability as of 2018. This will be followed by SIDAR in 2019, EPS-SG-B1 in 2022.

6.5 In thanking Mr Bernard for his presentation, the Meeting noted that the full report on 2013-2014 operations, on system improvements and progress in projects is reproduced as **Annex VIII**.

6.6 The meeting, noting the retirement of Mr Bill Woodward (CLS America) wished to commend him for all of his past contributions to Argos operations and developments, support to its users, and the JTA activities.

## 7. Review of User Requirements and issues

### 7.1 Approval of the ToRs of Technical Advisory Group Wildlife Argos Applications

---

<sup>7</sup> Satellite High-performance ARGOS-3/-4 Receive/transmit Communication

7.1.1 The meeting approved the Terms of Reference of the Technical Advisory Group on Wildlife Argos Applications (TAGW) as proposed by the Executive Committee. These are provided in the JTA Operating Principles (**Annex XI**).

7.1.2 The meeting noted that the Chair of the TAGW remains to be appointed, and the advisory group formed. It tasked the JTA-EC to finalize the membership of the Advisory Group and to make a proposal at the next JTA meeting (**action; JTA-EC; JTA-36**).

## **8. REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS**

### **8.1 Review of the guiding principles for negotiating the Tariff**

8.1.1 The Chair of the JTA, Mr. Locklear, began this discussion with a review of the cost principles for allocating CLS costs to the JTA. In principle, the JTA costs to be recovered are derived as a percentage of CLS' total operating costs that are attributable to the JTA. This cost allocation method has been used by CLS for many years and is documented in presentations given by the Chairman of CLS, Mr. Christophe Vassal in Argos financial presentations given the Argos Operations Committee (OPSCOM), and the Argos JTA.

8.1.2 In 2014, at the close of the accounts, the JTA incurred a total cost of 6.91 M €, and total revenue of 7.26 M €, for a 0.35M € positive cash flow.

8.1.3 The meeting agreed that it would be useful to have some information from CLS on how flexible it is in controlling its operating costs to take into account the possibility of a decline in JTA Argos usage. The meeting requested the JTA-EC to address this issue with CLS, in the view to have some feedback provided at JTA-36 (**action; JTA-EC; JTA-36**).

### **8.2 Review the Five-Year (5Y) Plan 2015 to 2019**

#### 2014 FINANCIAL SITUATION: CLOSE OF ACCOUNTS

8.2.1 The Chair presented the 2014 JTA usage and revenues.

8.2.2 Details of the finalized Argos operating costs for 2014 are given in **Annex IX**, and are summarised below:

- In 2014, CLS recorded revenues from JTA participating countries at a level of 7.26 M€, a 2.2% increase from 2013 due to a larger contribution from large US programs.
- As a consequence, in 2014, the JTA realized an excess of 350 K€. The non JTA incomes have remained essentially stable in 2014 (slight decrease from 6.30 M€ to 6.05 M€), and the corresponding applications (fishing and sensitive) are still exceeding significantly their portion of the costs.
- The Argos basic costs are linked to the level of income. They are calculated at 12.01 M€ in 2014, the same level that they were in 2012.
- The Argos basic costs for science are calculated at 7.25 M€ in 2014 representing 60% of the total basic costs, which is consistent with the percentage of scientific active PTTs in the Argos system.
- In 2014, we had a total of 12,540 active PTTs used for scientific applications and 11,587 active and 366 inactive status or 11,953 PTTs under the JTA. Thus, JTA represents 95.32% of total active PTTs used for scientific applications. As a consequence, in 2014, the costs to be attributed to the JTA are calculated at 6.91 M€.

#### 2015 JTA PROJECTION TO YEAR END

8.2.3 The JTA projection for the year 2015 is estimated from figures based on seven months of usage, extrapolated until the end of the year, and is detailed in **Annex IX**. A summary is provided in table 1 below.

	<b>Actual for 2014</b>	<b>Extrapolated for 2015</b>	<b>Increase</b>
<b>Active PTTs/Month</b>	11582	11781	1.67%
<b>PTT-Years</b>	2807.48	2938.10	4.7%

**Table 1:** Average active PTTs per month, and PTT.Years actually transmitting in 2014, and extrapolated for 2015, and increase.

8.2.4 The JTA noted that the total number of active PTTs should slightly increase in 2015 compared to 2014 (194 additional PTTs representing + 1.67%). The decreasing number of floats is compensated by the number of platforms deployed on buoys and animals. However the corresponding usage of the system will increase in 2015 (+ 4.7%). Like in 2014, this is due to the deployment of buoys that far outweigh the floats consumptions which transmit much less in a month. Animal tracking applications continue their steady growth.

8.2.5 The JTA noted the following:

- Consumption of “Buoys and Others” has been decreasing since 2010. However, since 2013 this trend is reversing due to deployment of more buoys with longer lifetimes. This category still represents the highest consumption compared to the other categories.
- Consumption of “Animals” continue to progress. This year the animal consumption increase is expected to be 5%.
- “Floats” consumption should continue to decrease by 8 PTT-years (-4.57 %) compared to 2014.
- “Fixed Stations” consumption remains quite stable, even if this category represents only 4% of the total agreement.

8.2.6 At this point of time, the JTA considered that the JTA in 2015 will likely be able to pay its portion of the cost with a small expected excess of 300 K€.

8.2.7 Overall, the JTA basic income is expected to be 7.57 M€ in 2015, 4.5% above the figure planned in the FYP for 2015 to 2019. The breakdown of expected income by platform type is shown in the table 2 below:

	<b>Total in M€</b>
Wildlife	4,53
Fixed Stations	0,16
Buoys & Others	0,46
Floats	0,48
Large Program Buoys & Others	1,63
Large Program Floats	0,31

**Table 2:** Breakdown of expected income by platform type

8.2.8 The additional revenues are expected to be in the order of 300K€ in 2015- based on the invoicing of unused Id.

8.2.9 As in 2014, the JTA costs will be closely controlled in 2015.

8.2.10 Non-JTA activity remains stable and may increase should CLS continue to find new applications eligible to the Argos System.

8.2.11 In conclusion, the expected financial situation for 2015 is considered safe. The accumulated balance would remain significantly positive. Nevertheless, risks will continue to be monitored very closely by CLS.

#### Five Year Plan 2015 - 2019

8.2.12 The JTA recalled that the new Five Year Plan (FYP) for the period 2015 to 2019 was approved by JTA-34 (Weihai, China, Oct. 2014), and endorsed by the Argos Operations Committee (OPSCOM-49 in June 2015). The updated FYP (reflecting JTA-35 decision to charge non-US wildlife applications at 7 € instead of 7.5 €) is provided in Table 3 below. The JTA recalled that FYPs has the following characteristics:

- 1) Costs Attributable to the JTA have decreased by approximately \$1.0M euro from 2010 - 2014.
- 2) The new FYP is projecting a 37% decrease in large program buoy usage, but only a 34% reduction in revenue by the end of 2019.
- 3) The new FYP is projecting an increase in Wildlife usage by 14% with a corresponding increase of 13% in revenue.
- 4) The new FYP separates the revenue by family (Wildlife, Buoys, Floats, & Fixed Stations)

8.2.13 The meeting noted that the cumulated balance is only to be viewed as an indicator of the overall JTA financial health. It is the responsibility of the Argos JTA to manage the process of analyzing the costs and revenue of the system and adjusting as necessary. The meeting agreed that despite the expected loss to the JTA starting in 2017, the JTA will remain healthy because of the cumulated balance.

	2015	2015	2016	2017	2018	2019
	extrapolated	Projected	Projected	Projected	Projected	Projected
<b>JTA USAGE</b>						
<b>ACTIVE PTTs</b>						
Wildlife	7369	7523	7749	7981	8221	8467
Fixed Stations	151	140	126	113	102	92
Buoys & Others	580	576	547	520	494	469
Floats	1222	1050	1000	950	900	850
Large Program Buoys & Others	1406	1300	1100	1000	900	800
Large Program Floats	1054	1050	1000	950	900	850
<b>Total</b>	<b>11782</b>	<b>11638</b>	<b>11521</b>	<b>11514</b>	<b>11516</b>	<b>11528</b>
<b>PTT-Year</b>						
Wildlife	1170	1128	1162	1197	1233	1270
Fixed Stations	122	126	113	102	92	82
Buoys & Others	225	230	219	208	197	188
Floats	94	86	82	78	74	70
Large Program Buoys & Others	1255	1068	904	822	740	658
Large Program Floats	73	86	82	78	74	70
<b>Total</b>	<b>2939</b>	<b>2725</b>	<b>2563</b>	<b>2485</b>	<b>2410</b>	<b>2337</b>
<b>BASIC SERVICE INCOME</b>						
Wildlife	4.53	4.44	4.58	4.71	4.86	5.00
Fixed Stations	0.16	0.16	0.15	0.13	0.12	0.11
Buoys & Others	0.46	0.47	0.45	0.43	0.40	0.38
Floats	0.48	0.43	0.41	0.38	0.36	0.34
Large Program Buoys & Others	1.63	1.40	1.19	1.08	0.97	0.86
Large Program Floats	0.31	0.33	0.32	0.30	0.28	0.27
<b>Total</b>	<b>7.57</b>	<b>7.24</b>	<b>7.08</b>	<b>7.04</b>	<b>7.00</b>	<b>6.97</b>
Additional revenue (net revenue) and adjustments	0.30	0.30	0.19	0.18	0.18	0.18
<b>Total revenue</b>	<b>7.87</b>	<b>7.54</b>	<b>7.27</b>	<b>7.22</b>	<b>7.18</b>	<b>7.15</b>
<b>JTA EXPENSES (M Euros)</b>						
Year Balance	0.63	0.31	-0.07	-0.23	-0.38	-0.53
Carried Forward From Previous Year	3.55	3.55	3.86	3.78	3.55	3.17
Cumulative Balance	4.19	3.86	3.78	3.55	3.17	2.64

**Table 3:** The 2015-2019 Five Year Plan

### 8.3 Introductory Entry Packages for Developing Countries

8.3.1 The meeting noted that following WMO and IOC Executive bodies guidance, the JTA Executive committee at its 12<sup>th</sup> Session proposed establishing a working group to explore the development of an end-to-end Entry Level kit for emerging countries, such as developing countries and SIDS for Argos. The working group should also examine if the five year plan should include support for this, or rely on external funding sources. The meeting also noted that the decline of observing stations in polar regions is negatively impacting Numerical Weather Prediction (NWP) and climate forecasts, and that in line with recommendations of the WMO Executive Council Panel of Experts on Polar and High Mountain Observations, Research and Services (EC-PHORS), special effort could be promoted for scientific activities in such regions. The meeting decided to establish an intersessional working group, comprised of Johan Stander (South Africa), Gillian Lichota (CLS America), David Meldrum (UK), and Yann Bernard (CLS), tasked to address these two issues, and make proposals at the next JTA meeting through the JTA-EC (**action; working group; JTA-36**).

## 9. TERMS AND CONDITIONS OF THE 2016 GLOBAL AGREEMENT

9.1 Based on (i) the projections for 2015 and 2016, in which it was expected that the income was balancing the JTA cost, (ii) the positive situation in the accumulated balance in the FYP at this moment, the meeting decided not to change the Tariff in 2016, except for the non-US wildlife applications benefiting from a 0.5 € of tariff reduction in order to take into account currency exchange adjustments. The Meeting adopted the Terms and Conditions for the 2016 Agreement as given in **Annex X**.

9.2 The 2016 Agreement is almost identical to the 2015 Agreement, with the following minor amendments:

- (i) 2015 is replaced by 2016;
- (ii) 365 is replaced by 366;
- (iii) The Animals category is renamed to "Wildlife applications (USA)"
- (iv) A new category "Wildlife applications (non-USA)" is introduced, with a A coefficient of 7 €

9.3 The essential elements of the tariff remain unchanged for 2016, except for the non-US wildlife applications, namely:

- (i) "USER BASIC SERVICE CHARGES", A and B coefficients for all platform categories are as follows:

Category	A (€)	B (€)
<b>Buoys and others</b>	15	5
<b>Fixed Stations</b>	15	3
<b>Wildlife applications (USA)*</b>	15	7.5
<b>Wildlife applications (non-US) *</b>	15	7
<b>Subsurface Floats</b>	15	7.5

\*12 days per month cap applied

- (ii) "DISCOUNT SCHEME FOR LARGE PROGRAMMES", the rates are as follows:

Number of platform-years	PTT-day unit (B) Buoys & others	PTT-day unit (B) Floats
600	4	6
900	3	4.5



1200	2	3
------	---	---

9.4 As in previous years, CLS was requested to provide a scanned, signed copy of these Terms and Conditions to ROs and ROCs.

## 10. FUTURE PLANS AND PROGRAMMES

10.1 The meeting reviewed brief national reports on plans and programmes for data collection using the Argos system.

### ***Presentations***

10.2 There was no specific presentation on a particular topic relevant to this agenda item made during the meeting.

### ***National reports***

10.3 Eleven national reports were submitted in written form by Australia, China, Germany, India, the Netherlands, New Zealand, South Africa, Sweden, Switzerland, the United Arab Emirates, and the United States of America. The National Reports submitted by ROCs for Argos related national activities during the last intersessional period (2014-15) are available in document JTA-35/Doc.9, which can be downloaded from <http://www.jcomm.info/JTA-35>, or requested of the IOC or WMO secretariats.

10.4 Representatives of Country (ROCs) present at the meeting also presented the following national reports: Australia (presentation by Holly Lourie), China (presentation by Shouhua Liu), India (presented by R. Venkatesan), and UAE (presentation by Salim Javed). The JTA was unanimous in agreeing that such reports were central to its prime motivation in being a practical and open forum for the exchange of information, experience (both positive and negative), problems and needs arising from the extensive Argos user community.

10.5 The meeting thanked all the presenters, and noted the following from the national reports presentations:

- In his report, Dr R. Venkatesan informed that India is using Argos services for Ocean Observation platforms such as Argo floats, drifting buoys, Wave rider buoys, Glider, ADCP moorings, fish tagging and moored buoys. Out of which buoys and others -30; Profiling floats 93; Animals 10; Fixed stations 17, totalling to 150 platforms having 59.40 PTT years. Since the bandwidth is low, India could not acquire higher vertical resolution of temperature and salinity. Also, the floats need to be longer time on the surface for transmission, it quickly drifting to the shore or beached. Further, India could not communicate to the float/buoy, once deployed. Higher bandwidth and two way communication should offer opportunities to improve the situation. Low cost, low power one way communication is very much suitable for some platforms, but it will not cater all platforms. Improvement in location accuracy is good initiative by Argos. The JTA invited CLS to consider the following recommendations and to report at the next JTA Session (***action; CLS; JTA-36***):
  - (i) if the PTT ID is not used by any country for more than a year, then CLS should send a reminder to that country and remove the ID number. Before charging an unused ID, CLS should ask the ROC to confirm; and
  - (ii) position transmitters used in fixed platforms should be reliable enough with batteries lasting at least one year.

10.6 The meeting noted that CLS has continued to be responsive to the Member States national report issues and has acted upon all of the above issues on a nation by nation basis.

## 11. REVIEW OF THE OPERATING PRINCIPLES

11.1 The meeting reviewed the JTA Operating Principles and proposals for changes offered by EC-12. In particular, the meeting reviewed the following topics relevant to the Operating Principles and updated them accordingly.

### ***History & Purpose of JTA***

11.2 The meeting noted that the JTA-EC agreed upon the need to strengthen the formal registration procedures for participants in the JTA meetings. Since the JTA discussions and decisions involve committing Nations to a tariff structure for their users, it is critical that Argos JTA ROCs have the authority to do so from their country. While formality through the IOC and WMO Secretariats is required to unambiguously identify ROCs, the recruitment of ROCs is probably best handled by the CLS, who have direct access to the Argos users of each country. It is recommended that countries be required to confirm who their ROCs are.

### ***Participation of ROCs at JTA Sessions.***

11.3 The meeting noted that the participation of the ROCs in the JTA is uneven, with some of the heaviest user states not regularly represented. The JTA-EC had discussed ways to improve active participation in governance of the JTA, especially among members with a great stake in the deliberations. The JTA-EC had also recognized the issue, and had noted that the executive committee was created to assure continuity and representation for the largest users. The meeting recalled that the Chair has the right to appoint members to assure proper balance. The meeting requested the Secretariat to make sure that the invitation letters for JTA-36 will go to the Permanent Representatives of WMO and the IOC Action Addressees with the ROCs cc'ed. The letters should also include the information from the Chair on the purpose and function of the JTA (***action; Secr.; JTA-36***).

11.4 Gillian Lichota (CLS America), and Scott Rogerson (USA) highlighted the possibility of including the newly developed System User Agreement (SUA) Citation Agreement as a document that the ROCs promote to their User Community under the Argos JTA Operating Principles (Argos-JTA-34/Doc.8, Appendix A. p 9, Annex XI-A). The group considered the possibility and determined that although it's a good recommendation for the ROC, the JTA Operating Principles is not the place for inclusion. The meeting requested the ROCs to invite the national Argos users to consider including the Citation<sup>8</sup> in peer reviewed journals, newspapers, web postings and/or social media interviews when describing their scientific work that used Argos satellite data telemetry (***action; ROCs; ongoing***).

### ***Inclusion of ongoing action items in the JTA Operating Principles***

11.5 The meeting agreed that the open ongoing Action Items from the current and past JTA Sessions should be included in the operating principles.

### **Terms of Reference and membership of the JTA Executive Committee.**

11.6 The meeting noted that the Satcom had recommended and the 5<sup>th</sup> Bio-logging Science Symposium (<http://bls5.scienceconf.org>) endorsed the establishment of a working group to represent the wildlife tagging community and address issues including the perception of an in-

---

<sup>8</sup> The citation read as follows: *The Argos Data Collection and Location System was used to collect the scientific data for this work. A global satellite system dedicated to studying and protecting the environment, Argos is an international program that relies on instruments provided by the Centre National d'Etudes Spatiales (CNES) flown on polar-orbiting satellites operated by the National Oceanic and Atmospheric Administration (NOAA), the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) and the Indian Space Research Organization (ISRO).*

equitability of tariff plans between the wildlife tagging community and other Argos users. The JTA agreed that this ATAG user group can naturally become a RUG for JTA. The JTA further agreed that the Chair of that group could be offered a position on the JTA EC, which would strengthen the presence of wildlife users on the EC and aid the establishment of the ATAG, by providing more legitimacy as the representative organization of the community.

11.7 The meeting noted that the JTA-EC had discussed the qualification of Holly Lourie, a CLS Australia employee, to represent the users of Australia, pending another Australian Argos user nomination. The recommendation was passed to the Permanent Representative of Australia with the WMO, who concurred with the nomination.

11.8 The meeting noted that CLS Australia is currently in discussion with the Integrated Marine Observing System (IMOS) to nominate a representative to become the new Australian ROC in replacement of the current interim ROC, Ms Holly Lourie.

11.9 The meeting requested CLS to identify a ROC for France (**action; CLS; JTA-36**).

11.10 The meeting invited the JTA-EC to consider updating the Operating Principles to change the term of the JTA-EC members in order to better reflect a commitment to improve long term continuity of the JTA activities (**action; JTA-EC; JTA-EC-14**).

11.11 The meeting requested the Secretariat to make proposal to the JTA-EC regarding the governance of the nomination of the ROs and ROCs for its consideration (**action; Secretariat; JTA-EC-14**).

11.12 The meeting requested the JTA-EC to develop a JTA ROC and RUG nomination package to be considered by the JTA-EC. The package will be used by the Secretariat to prepare the invitation letters to JTA meetings, and asking for nominations (**action; JTA-EC; JTA-EC-14**).

11.13 The approved revised Operating Principles are provided in **Annex XI**.

## **12. REVIEW OF THE ACTION ITEMS**

12.1 The meeting reviewed the status of action items from past JTA and JTA-EC Sessions, together with those from OPSCOM-49.

12.2 Updated status of actions from these Meetings, along with those arising at JTA-35, are listed and described in **Annex VI**. As noted under item 11, the ongoing Action Items are now listed with the Operating Principles as a new Annex.

## **13. ANY OTHER BUSINESS**

### ***International forum of Users of Satellite Data Telecommunication Systems***

13.1 The meeting noted the formal establishment of the International Forum of Users of Satellite Data Telecommunication Systems (Satcom forum) by the Seventeenth World Meteorological Congress (Cg-17, Geneva, Switzerland, 25 May – 12 June 2015).

13.2 The meeting noted that Mr Michael Prior Jones (TTP plc, UK) was nominated to chair the Satcom Forum, and that it was agreed to prepare for a meeting of the Satcom Forum alongside the Meteorological Technology World Expo<sup>9</sup> (Madrid, 27-29 September 2016). Mr Prior Jones participated in the JTA discussions under this agenda item via teleconference. He introduced

---

<sup>9</sup> <http://www.meteorologicaltechnologyworldexpo.com/>

himself, and reported on his experience with regard to satellite data telecommunication (satcom) systems. He explained that the Satcom Forum was meant to operate as an information exchange mechanism allowing the users of satcom systems to receive comprehensive information about the capabilities and costs of such systems in order for them to make an informed decision on what system(s) to use for addressing their user requirements. The Satcom Forum will also collect and document the user satcom requirements for the satcom operators and the platform transmitter manufacturers to use in order to better take such requirements into account.

13.3 The JTA agreed that the JTA could operate as a programme under the Satcom Forum umbrella and report on its activities to the Satcom Forum, but should at the same time be able to continue operating independently.

13.4 The JTA agreed that the JTA could be seen as an excellent example of partnership developed between government agencies and private companies. Such an example could also be used for other satellite data telecommunication systems building on JTA experience.

#### 14. ELECTION OF THE EXECUTIVE COMMITTEE

14.1 The Meeting recalled the Terms of Reference of the JTA Chairperson (**Annex F** to the Operating Principles), indicating the term for this position as two years, eligible for re-election but in principle only for one subsequent term.

14.2 The Meeting also recalled the Terms of Reference of the JTA Vice-Chairperson (**Annex G** to the Operating Principles), indicating the term for this position as two years, eligible for re-election but in principle only for one subsequent term.

14.3 The Meeting further recalled the Terms of Reference of the JTA Executive Committee (**Annex H** to the Operating Principles), and noted that the membership shall include the Chairperson, the Vice-Chairperson, the IOC Secretariat, the WMO Secretariat, and three additional members proposed by the Chairperson and elected by the JTA, serving a term of two years with an optional two-year re-appointment.

14.4 The Meeting noted the current composition of the JTA EC as detailed in Table 4 below:

<b>Role</b>	<b>Current incumbent</b>	<b>Elected at</b>	<b>Until</b>	<b>Status</b>
Chair	Eric Locklear (USA)	JTA-33	End of JTA-35	1st Term (first elected at JTA-33), and available for re-election for this post at JTA-35
vice-Chair	Johan Stander (South Africa)	JTA-33	End of JTA-35	1st Term (first elected at JTA-33), and available for re-election for this post at JTA-35
Member	Salim Javed (UAE)	JTA-33	End of JTA-35	1 <sup>st</sup> Term (first elected at JTA-33), and available for re-election to this post at JTA-35
Member	Vacant	n/a	n/a	n/a
Member	Vacant	n/a	n/a	n/a
Ex-officio	Tom Gross (IOC)	n/a	n/a	n/a
Ex-officio	Etienne Charpentier (WMO)	n/a	n/a	n/a
Ex-officio	CLS	n/a	n/a	n/a

**Table 4:** Current composition of the JTA-EC (for the past intersessional period until the end of this JTA Session)

14.5 The meeting, noting the requirements for succession planning, noted that the Chairperson, the vice-Chairperson, and one JTA-EC member (Salim Javed) were eligible for re-election. In addition, two new JTA EC members were expected to be elected during the JTA-35 Session.

14.6 The meeting elected the people listed in Table 5 below for the membership of the JTA Executive Committee.

<b>Role</b>	<b>Current incumbent</b>	<b>Elected at</b>	<b>Until</b>	<b>Status</b>
Chair	Eric Locklear (USA)	Re-elected at JTA-35	End of JTA-37	2 <sup>nd</sup> Term (first elected at JTA-33), and not available in principle for re-election for this post at JTA-37
vice-Chair	Johan Stander (South Africa)	Re-elected at JTA-35	End of JTA-37	2 <sup>nd</sup> Term (first elected at JTA-33), and not available in principle for re-election for this post at JTA-37
Member	Salim Javed (UAE)	Re-elected at JTA-35	End of JTA-37	2 <sup>nd</sup> Term (first elected at JTA-33), and not available in principle for re-election to this post at JTA-37
Member	Kim Holland (USA)	JTA-35	End of JTA-37	1 <sup>st</sup> Term (first elected at JTA-35), and available for re-election to this post at JTA-37
Member	Holly Lourie (Australia)	JTA-35	End of JTA-37	1 <sup>st</sup> Term (first elected at JTA-35), and available for re-election to this post at JTA-37
Ex-officio	Tom Gross (IOC)	n/a	n/a	n/a
Ex-officio	Etienne Charpentier (WMO)	n/a	n/a	n/a
Ex-officio	CLS	n/a	n/a	n/a

**Table 5:** New composition of the JTA-EC (for the next intersessional period until the end of JTA-37)

14.7 The meeting congratulated and thanked Mr Eric Locklear and the EC members for their work on behalf of the JTA during the last intersessional period

14.8 In order to prepare the elections for JTA-37, the meeting invited the ROCs to consider becoming JTA-EC members, and being candidates for the JTA Chair and Vice-Chair positions at JTA-37.

## **15. DATE AND PLACE OF THE NEXT MEETING**

15.1 The meeting noted the following event of interest to the JTA:

- The first meeting of the Satcom Forum to be held in principle in Madrid, Spain in September 2016 in conjunction with the Meteorological Technology World Expo (Madrid, 27-29 September 2016).
- The Thirty-second session of the Data Buoy Cooperation Panel (DBCP-32), USA, 17-21 October 2016.

15.2 The meeting decided to organize the JTA-36 from 24 to 26 October 2016 in USA in conjunction with DBCP-32. The dates tentatively will be dependent upon finalized scheduling of the DBCP-32.

## **16. CLOSURE OF THE MEETING**

16.1 In closing the Meeting, the Chairperson, Mr Eric Locklear recalled that the JTA is a unique example of a mechanism providing a strong partnership between the public and the private sectors. He thanked all participants for their contributions to the Meeting. In so doing, he particularly thanked CLS for its ongoing support, their continued openness in interacting as fully as possible with the JTA community, and for their efforts to reduce the operating cost induced by the JTA. He particularly thanked Mr Bill Woodward (USA) for his longstanding contribution to the JTA, the JTA vice-chair, Mr Johan Stander for his assistance during the intersessional period.

16.2 The meeting thanked the Chair for his patience, pro-activeness, guidance, and leadership in running the JTA business, both during the meeting and the past intersessional period..

16.3 The meeting noted and thanked the important and continued contributions of the WMO and IOC secretariats in ensuring the success of the Meeting. The meeting thanked both Tom Gross (IOC Secretariat) and Etienne Charpentier (WMO Secretariat) for their assistance in preparing and running the meeting, and the WMO Secretariat for the excellent venue.

16.4 The Chairperson reminded the Meeting of the valuable work done by the Executive Committee during the inter-sessional period, which definitely contributes to an efficient and effective formal JTA meeting.

16.5 Mr Locklear and the host concluded in wishing all participants a safe journey back to their home destinations.

16.6 Finally the meeting thanked the Chair for his leadership to run this meeting and support the work of the JTA during the intersessional period.

16.7 The Meeting closed at 11:50 on 28 October 2015.

---

**ANNEX I**

**LIST OF PARTICIPANTS**

**REPRESENTATIVES OF COUNTRY  
(ROCS)**

**MEMBER OF THE EXECUTIVE  
COMMITTEE**

Mr Eric R LOCKLEAR  
Chairman, JTA  
National Oceanic & Atmospheric  
Administration, Silver Spring  
Climate Program Office  
1315 East-West Highway,  
Room 12107, SSMC 3  
Silver Spring MD 20910-5603  
United States  
Tel: +1 301 734 1236  
Fax: +1 301 713 0518  
Email: eric.locklear@noaa.gov

Dr Salim JAVED  
Manager, Terrestrial Assessment &  
Conservation  
Environment Agency  
Murour Road , P.O. Box 45553  
ABU DHABI  
Abu Dhabi  
United Arab Emirates  
Tel: +971 2 6934711  
Fax: +971 22 4997282  
Email: sjaved@ead.ae

Mr Johan STANDER  
South African Weather Service  
Weather Office,  
P O Box 21,  
International Airport  
Cape Town  
7525  
South Africa  
Tel: +27 (0) 21 9355700  
Fax: +27 (0) 21 934 4590  
Email: Johan.Stander@weathersa.co.za

**OTHER ROCS**

Prof. David MELDRUM  
Research Fellow, Technology Development  
Scottish Association for Marine Science  
Scottish Marine Institute  
Oban, Scotland  
PA37 1QA  
United Kingdom  
Tel: +44 1631 559 273  
Fax: +44 1631 559 001  
Email: dtm@sams.ac.uk

Dr Birgit KLEIN  
Bundesamt fuer Seeschifffahrt und  
Hydrographie  
Bernhard-Nocht Straße 78  
20359 Hamburg  
Germany  
Tel: +49 40 3190 3228  
Fax: +49 40 3190 5000  
Email: birgit.klein@bsh.de

Ms Holly LOURIE  
CLS Australia  
3/33 Forbes St.  
Turner  
ACT 2612  
Australia  
Tel: +61 0403855954  
Email: holly@clsargos.com.au

Dr R. VENKATESAN  
National Institute Of Ocean Technology  
Pallikaranai  
Velachery - Tambaram Road  
Chennai 600100 India  
India  
Tel: +91 44 6678 3535  
Fax: +91 94443 99829  
E-mail: dr.r.venkatesan@gmail.com

**OTHER REPRESENTATIVES**

Mr Gilbert EMZIVAT  
Météo-France, CMM  
13 rue du Chatellier – CS12804  
29288 BREST CEDEX 2  
France  
Tel: +33 (0)2 98 22 18 53  
Fax: +33 (0)2 98 22 18 49  
Email: gilbert.emzivat@meteo.fr

Mr Scott ROGERSON  
Argos DCS Program Manager  
NOAA Satellite Operations Facility  
United States  
Tel: +1 301-817-4543  
Email: Scott.Rogerson@noaa.gov

Dr Shouhua LIU  
Associate Scientist  
National Marine Data and Information Service  
No 93 Liuwei Road  
300171 Tianjin  
China  
Tel: 022 240 10834  
Fax: 022- 240 0926  
Email: huazai950@hotmail.com

Dr Ting YU  
National Marine Data and Information Service  
State Oceanic Administration  
No 93 Liuwei Road,  
Hedong District  
Tianjin  
300171  
China  
Tel: +86 22 2401 0821  
Fax: +86 22 2401 0926  
Julia\_yu\_nmdis@163.com

**SECRETARIAT**

Mr Etienne CHARPENTIER  
Scientific Officer  
World Meteorological Organization  
Observing and Information Systems  
Department  
Observing Systems Division  
World Meteorological Organization  
7bis, av. de la Paix  
Case Postale 2300  
1211 Genève 2  
Switzerland  
Tel: +41 22 730 82 23  
Fax: +41 22 730 81 28  
Email: ECharpentier@wmo.int

Dr Thomas GROSS  
Programme Specialist GOOS, Web Services  
Intergovernmental Oceanographic  
Commission of UNESCO  
7, place de Fontenoy  
75732 Paris cedex 07  
France  
Tel: +33 1 45 68 39 92  
Fax: +33 1 45 68 58 12  
Email: t.gross@unesco.org

**CLS**

Mr Yann BERNARD  
Head of Environmental Monitoring  
Department  
Collecte et Localisation par Satellite  
(CLS/Service Argos)  
Parc Technologique du Canal  
8-10, rue Hermès,  
31520 Ramonville Saint-Agne  
France  
Tel: +33 (0)5 61 39 39 09  
Fax: +33 (0)5 61 39 47 97  
Email: ybernard@cls.fr



JTA-35 record of decisions

Gillian LICHOTA  
CLS America, Inc.  
4300 Forbes Boulevard, Suite 110  
Lanham MD 20706  
United States  
Email: glichota@clsamerica.com

Ms Holly LOURIE  
CLS Australia  
3/33 Forbes St.  
Turner  
ACT 2612  
Australia  
Tel: +61 0403855954  
Email: holly@clsargos.com.au

---

**ANNEX II**

**AGENDA**

**THIRTY-FIFTH SESSION OF THE Argos JOINT TARIFF AGREEMENT**  
*(Geneva, Switzerland, 26-28 October 2015)*

**1. ORGANIZATION OF THE MEETING**

- 1.1 Opening of the meeting
- 1.2 Adoption of the agenda
- 1.3 Working arrangements
- 1.4 Selection of the Writing Group (WG)

**2. REPORT OF THE CHAIRPERSON OF THE JTA**

- 2.1 Overview of the JTA
- 2.2 Report on the JTA activities during the intersessional period, including report of the JTA Executive Committee
  - 2.2.1 Feedback from the International User Conference on Argos Wildlife Applications

**3. THE Argos JTA PROPOSED STRATEGY FRAMEWORK**

**4. FEEDBACK FROM THE 2015 NATIONAL REPORTS**

**5. REPORT ON THE 2015 GLOBAL AGREEMENT**

**6. REPORT ON THE DEVELOPMENT AND OPERATIONS OF CLS**

**7. REVIEW OF USER REQUIREMENTS AND ISSUES**

- 7.1 Approval of the ToRs of Technical Advisory Group Wildlife Argos Applications
  - 7.1.1 Announcement of Members of TAGW

**8. REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS**

- 8.1 Review of the guiding principles for negotiating the Tariff
- 8.2 FYP for 2015 to 2019
- 8.3 Introductory Entry Packages for Developing Countries

**9. TERMS AND CONDITIONS OF THE 2016 GLOBAL AGREEMENT**

**10. FUTURE PLANS AND PROGRAMMES**

**11. REVIEW OF THE OPERATING PRINCIPLES**

**12. REVIEW OF ACTION ITEMS**

**13. ANY OTHER BUSINESS**

13.1 Satcom developments

**14. ELECTIONS**

**15. DATE AND PLACE OF THE NEXT MEETING**

**16. CLOSURE OF THE MEETING**

---

### ANNEX III

#### REPORT OF THE THIRTEENTH MEETING OF THE EXECUTIVE COMMITTEE OF THE ARGOS JOINT TARIFF AGREEMENT (JTA-EC-13) (Geneva, Switzerland, 28 October 2015)

##### 1. Review Actions items from JTA-35 and make assignment

The meeting reviewed actions items from JTA-35, and agreed to task assignment as reflected in the table in the annex.

##### 2. Amending the Operating Principles

The meeting identified sections of the Operating Principles that need being updated, and assigned action to committee members for updating them as follows:

- Writing an introduction to the operating principles to refer to new Vision and Mission (**action; Chair; JTA-EC-14**)
- Including a typical JTA-EC agenda in the Operating Principles as an annex (**action; T. Gross; JTA-EC-14**)
- Reviewing the intersessional workplan (Annex XI-J of the operating principles). JTA-EC workplan and reporting process to be developed and inserted in this annex (**action; Chair; JTA-EC-14**).

##### 3. Next JTA-EC meeting

The meeting noted with appreciation and concurrence the kind offer of the UAE to host the 14th JTA-EC meeting in Abu Dhabi in April 2016. Tentative dates are:

- 24 to 26 April 2016
- 18 to 20 April 2016

Johan Stander was requested to confirm preferred choice for the dates (**action; J. Stander; asap**).

**ANNEX OF ANNEX III****Summary of action items from JTA-EC-13**

<b>No.</b>	<b>Ref. (agenda item)</b>	<b>Action/decision item</b>	<b>By whom</b>	<b>Deadline</b>	<b>Comment</b>
JEC13#1	J35/2.3.6	JTA-EC to propose a new structure of the JTA assuring proper governance, and user representation	Chair	JTA-EC-14	ToRs of the ROCs, RUGs and nomination process to be reviewed. Targeted user groups: <ul style="list-style-type: none"> <li>• GOOS</li> <li>• JCOMM</li> <li>• CBS</li> <li>• Wildlife ?</li> </ul>
JEC13#2	J35/3.4	JT-EC to develop the strategy document according to the template, in the view to submit it to the next Session of the JTA in 2016	J. Stander, Gillian	JTA-36	
JEC13#3	J35/7.1.2	JTA-EC to finalize the membership of the Technical Advisory Group on Wildlife Argos Applications (TAGW) and to make a proposal at the next JTA meeting	Chair	JTA-36	Eric to develop a proposal with the Chair of TAGW.
JEC13#4	J35/8.1.3	JTA-EC to provide JTA-36 with information on how flexible it is in controlling the Argos operating costs to take into account the possibility of a decline in JTA Argos usage	CLS & Chair	JTA-36	
JEC13#5	J35/8.3.1	to address the two issues of (i) introducing an end-to-end Entry Level kit for emerging countries, such as developing countries and SIDS for Argos, and (ii) promoting scientific activities using Argos in polar regions regions, and make a proposal at the next JTA meeting through the JTA-EC	J. Stander G. Lichota D. Meldrum Y. Bernard	JTA-EC-14	Proposal to be developed by JTA-EC-14
JEC13#6	J35/11.10	JTA-EC to consider updating the Operating Principles to change the term of the JTA-EC members in order to better reflect a commitment to improve long term continuity of the JTA activities	J. Stander	JTA-EC-14	Proposal to be made at JTA-EC-14

JTA-35 record of decisions, Annex III

<b>No.</b>	<b>Ref. (agenda item)</b>	<b>Action/decision item</b>	<b>By whom</b>	<b>Deadline</b>	<b>Comment</b>
JEC13#7	J35/11.12	JTA-EC to develop a JTA ROC and RUG nomination package to be considered by the JTA-EC. The package will be used by the Secretariat to prepare the invitation letters to JTA meetings, and asking for nominations	Chair	JTA-EC-14	Chair to liaise with the Secretariat in this regard.
JEC13#8	JEC13	Writing an introduction to the operating principles to refer to new Vision and Mission	Chair	JTA-EC-14	
JEC13#9	JEC13	Including a typical JTA-EC agenda in the Operating Principles as an annex	T. Gross	JTA-EC-14	
JEC13#10	JEC13	Reviewing the intersessional workplan (Annex XI-J of the operating principles). JTA-EC workplan and reporting process to be developed and inserted in this annex.	Chair	JTA-EC-14	
JEC13#11	JEC13	to confirm preferred choice for the dates of JTA-EC-14	J. Stander	asap	

## ANNEX IV

### **ABRIDGED<sup>10</sup> REPORT OF THE 12<sup>TH</sup> MEETING OF THE JTA EXECUTIVE COMMITTEE (JTA EC-12) (Silver Spring, Maryland, USA, 15-17 July 2015)**

#### **Participants:**

##### Members, JTA-EC:

- Eric Locklear (Chair, JTA-EC, USA)
- Johan Stander (South Africa)
- Salim Javed (UAE)
- Tom Gross (IOC) – ex-officio
- Yann Bernard (CLS France) – ex-officio
- Bill Woodward (CLS America) – ex-officio

##### Invited persons:

- Chris Adomanis (CLS America, CEO)
- Seema Owen (CLS America)

## **1 Organization of the Meeting**

The twelfth Meeting of the Argos Joint Tariff Agreement (JTA) Executive Committee (JTA-EC-12) took place in Silver Spring, MD, USA, from 15 to 17 July, 2015.

Eric Locklear opened the official meeting of the JTA Executive Committee with welcome and explained the logistics.

The chair introduced several amendments to the proposed agenda. The Committee adapted the agenda to the discussion. The final agenda for JTA-EC-12 is provided in Annex I.

## **2 Issues from the Tenth and Eleventh Meeting of the JTA EC**

### **2.1 Discuss OPSCOM 49 Meeting**

Eric Locklear, Bill Woodward and Chris Adomanis attended the OPSCOM 49, 2015. The OPSCOM endorsed and closed the 5 year plan from 2010-2014, and adopted the new 5 year plan, 2015-2019. E. Locklear reported to the OPSCOM the outcomes of the 2014 JTA-14 and emphasized the importance of the documentation of previous JTA meetings to the transparency in the JTA process.

The current challenge of the JTA is to continue to evolve the spending plan and the JTA Operating Principles. The OPSCOM was directed to pay attention to the cumulative balance of the 5 year operating plan. The result is due to good management of costs, producing a healthy cumulative balance. 2015-19 5 year plan includes changes of the balance of revenue sources due to decrease of large programmes and increase in wildlife usage. The plan to reduce the cumulative balance over a ten year span was shown.

---

<sup>10</sup> The annexes of the report have been removed to avoid duplication with other annexes of this JTA report. The complete JTA-EC-12 report can be obtained upon request from the JTA Chair, the Secretariat, or downloaded from: <http://www.jcomm.info/JTA-35>

The five year plan and 2014 report presentation emphasized the usage by “Family”, e.g. buoys, fixed stations, wildlife tracking etc.. Changes in usage by country and family require the JTA to adapt changing emphasis. The JTA should examine the changes of usage by different groups, with a view toward anticipating future responses to users needs, technology and revenue.

The EC responded to a request to consider a special price scheme for emerging economy countries and Small Island Developing States (SIDS). The EC discussed the role of capacity development in JTA planning and the need to improve involvement of developing countries. Capacity building will include much more than just pricing incentives. Countries will also require infrastructure to design and implement programmes. Several suggestions were put forward for improving the situation, including funding adjustments, collaborative projects, sharing expertise and availability of planning systems. The EC favoured an approach based on an End-to-End development kit including reduced rates for building entry level programmes, in collaboration with service and tag manufacturers.

It was pointed out that such programmes have been successfully implemented in South America, leading to the emergence in Brazil of its own autonomous programme of profiling floats. Capacity development programmes need to be connected with the Argos capacity.

**Action 1:** EC to propose to JTA:

Establish a working group to explore the development of an End-to-End Entry Level kit for emerging economies, such as developing countries and SIDS for Argos. The working group should also examine if the Five year plan should include support for this, or rely on external funding sources. [Johan, JTA-35]

**2.1.1 Evaluate and propose a new construct for annual meeting**

The JTA-EC addressed the Action 49-5-J from OPSCOM “JTA Executive Committee to evaluate and propose a new construct for annual meetings.” Mr. Locklear began the discussion with a display of the JTA nations’ usage by PTT years, and pointed out the largest 5 users of each family type (Buoys & Others, Floats, Wildlife, and Fixed Stations). The idea presented was that the top users of the Argos system tended to have ROCs consistently attend the annual JTA meetings, and might a better approach be to create an Argos JTA committee composed of the top user nations, plus representatives for the other nations, and meet bi-annually instead of annually. This would ensure maximum representation of the maximum number of users, as well as representation of all others. Equity and openness is maintained. Also, there would be a JTA-EC meeting in-between the Argos Committee meetings, thus ensuring continuity, yet becoming more efficient and economical. The JTA-EC discussed these issues and scheduling methods available, including alternating years for JTA and JTA-EC meetings. But given the nature of the JTA’s work, an annual meeting schedule was agreed to be the best option for JTA to ensure problems and issues were quickly addressed, and the principles of openness and fairness were maintained

The issue of cost of secretariat support for the JTA meetings was discussed. These costs should not be confused with the UN approval of JTA process. National reporting of Member State views is an important part of the JTA and is enabled by the convening power of the UN organizations. The utility of the current arrangement for IOC and WMO Secretariat support was noted.

**2.2 Decisions from WMO Cg-17**

Johan Stander summarized the decisions of the recent WMO Congress, WMO Cg-17, which may concern the Argos programme. CLS is contributing to the WMO emphasis on Marine Meteorology Observations Programme (MMOP). There are many programmes in JCOMM which are noted by the Cg-17, and which use Argos. The Argos contribution to GOOS and JCOMM strengthens the recognition by WMO of these service delivery programmes for the MMOP, and interfacing through WIGOS. WIGOS is now able to share third party data through the WMO systems. MCDS Dataflow. DACs, GDACs, and Centres for Marine-Meteorological and Oceanographic Climate Data (CMOCs)



can be potential partners for cooperation with JTA. The WMO expects member states to enhance their delivery of real time data, a strength of the Argos. The UN has recognized as a high level priority, the “Blue Economy”, now endorsed as a UN Sustainable Development Goal.

### 2.2.1 Satcom Forum

The CG-17 approved (Cg017 4.2.3(1).8) the recommendation of the CBS-Ext. (2014) for WMO support of the Satcom and its ToRs. The EC discussed the role of the JTA within this approval of the Satcom. The committee noted that Mr Michael Prior Jones (BAS, UK) was nominated to chair the Satcom Forum, and that it was agreed to prepare for a meeting of the Satcom Forum alongside the CIMO Technical Conference in late September 2016 in Madrid, Spain.

JTA EC took note of the approval by CG of the Satcom. There is still an uncertainty concerning the remit of the Satcom to areas outside of meteorology and oceanic observations.

**ACTION 2:** JTA chair to request of Satcom chair an invitation to Satcom meeting in Madrid 2016.

**ACTION 3:** Requests DBCP chair to allow the JTA EC to report to the DBCP annual session.

The EC recognizes that it should keep independent from other forums to remain effective. The JTA could operate without the IOC and WMO secretariat support, but the cost could be the loss of recognition as an international organization and at this stage EC feels that JTA may at this stage do them more harm than good if they decided to move away from IOC and WMO secretariat support while the upcoming Satcom meeting should be used to decide on the how JTA should be functioning within Satcom.

### 2.3 Five-Year Plan 2010-2014; Five-Year Plan 2015 – 2019 Discuss assumptions.

Yann Bernard presented a review of the Five Year Plan for 2010-2014 with JTA 2014 financial situation in terms of activity and total basic incomes. (Annex VI) Of the total of 11 588 average monthly active PTTs, 62% are wildlife applications and the rest are ocean & meteorological applications. OCO large program (floats & drifters) represents 22% of the monthly active platforms. In term of PTT Years (1 PTT year = 365 full days of Argos transmission) the ocean & meteorological application have 60% of the total of 2 807 PTT years of the JTA in 2014. This is due to the fact that these applications, excepted profiling floats, stay on surface with a clear visibility of the sky (over the ocean) and transmit all the time. The Basic incomes include only Argos Monthly subscription and Daily fee of transmission (no value added services included). The Wildlife applications now are the main contribution with 62% of the 6.89 M€ of JTA 2014 Basic incomes.

The Argos JTA Five Year Plan for 2010-14 was presented in the old format. This plan has been reviewed and closed by OPSCOM. The 2015-19 FYP appears to be sustainable under current assumptions. Additional tariff concessions, or subsidies, may decrease the income to expense ratio. The presentation of the new Argos JTA Five Year Plan agreed last year (2014) for 2015 to 2019 demonstrates:

- A decrease of ocean/meteorological application activity and revenues.
- An increase of 3% per year of the wildlife application activity
- The level of total incomes is expected to remain stable around 7 M€ for the next 5 years.

Prices are the same for the full FYP period.

The Committee noted that the wildlife daily tariff continues to be incrementally higher than other categories because it includes the costs of the additional user services support traditionally needed for this application. It is a good value for them and needs to be better communicated to that

community. The committee also noted that many scientists must be able to reliably predict their costs when proposing research programmes and thus currency exchange rates continue to be a source of uncertainty to the researchers.

B. Woodward reported that any possible cost adjustment by CLS aimed at ameliorating exchange rate variability will be dependent upon actual revenue numbers through September 2015. A report on this topic will be presented at JTA-35.

**Action 4:** Mid-September IOC will convene a conference call to discuss the feasibility of the CLS proposal for tariff adjustment. (IOC, Sept. 2015)

## **2.4 Other issues:**

### **2.4.1 What should Argos JTA do to respond to the changing user needs?**

J. Stander suggested that we should examine the changes of usage by different groups, with a view toward anticipating future responses to user needs, technology and revenue and what is used to price the tariff.

The Committee briefly examined some of the observing systems technical requirements and the ability for Argos to satisfy them compared to other satellite communications systems. These requirements include, for example, timeliness, large data volume transfer, power requirements, etc. It was agreed that prudence suggests that it is essential to minimize long-term risk when considering which communications system to use by not exclusively using one system.

When considering Argos capabilities CLS explained that the pricing is for the basic service, which includes GTS QA and insertion. CLS does not separate their expenses for those services. Putting the data on the GTS serves all of the WMO, and is much more efficient than leaving this optional. CLS is a data distribution centre, which simplifies the system. Argos moved away from an a la carte pricing about ten years ago at the users request.

Service pricing for any communications system is a direct function of the volume of users. Argos is allowed to serve only the science community so pricing is based on a relatively small user base. As always, competition drives many of the issues, but Argos is a government programme and has little flexibility. Argos may ultimately become a niche market for small, low power etc. applications. Argos should not try to emulate competitors, but should build on the strengths of the system: small weight and size, low power requirements. The CLS long term strategy is to continue development to exploit this niche market.

The Committee concluded that it is essential to continue communicating with and educating the users about how Argos works and what the pricing structure is based on.

### **2.4.2 Discussion of Action item J34#05 (“Evaluate and analyse the CLS charging algorithm and metrics.”)**

CLS is continuously analysing the metrics of usage, and exploring alternatives. No metric has yet to be found that would be an improvement on the current pricing methods. The last time charging algorithm changes were made, was 2004, with the introduction of the timeslots, tariff coefficients, the large programme provision and the elimination of a complex menu of options. The method was presented and approved by JTA-23 2004. Continual analysis of metrics is necessary to know when the tariffs may need to be changed.

The JTA is annually asked to examine the system and approve it. The JTA Member States are empowered to propose an alternative. When changes are made adjustments on a case by case

basis are typically needed to provide the “soft landing” for some users, to avoid sudden changes in pricing. While some users may find the current process confusing, it is much simpler than before.

The rates were established before the wildlife community became significant. The wildlife issues were addressed in 2006 in La Jolla with the capping. The majority of the Argos community accepts the method which is simple and easy to use. However there is a perception that the fixed currency exchange rate that has been in place in the U.S. for decades goes against the “fair and equitable” message which sounds like the “same price”.. Additionally, recall that there is a volume discount which is available to the very large Climate Observation Program in NOAA (not to all U.S. users). It must be emphasized that any program with a single source of funding and with similar platforms may take advantage of this volume discount, the actual pricing for which is based on a sliding scale of Argos consumption in PTT-years. Different volume discounts are available at consumption levels of 300, 600, 900 and 1200 PTT-years. The larger the consumption the greater the price discount.

The Committee noted that a possible wildlife tracking adjustment is seen as valid, but should not be described as a compensation for Non-USA countries but rather as a global currency exchange adjustment for the non-U.S. dollar. If an adjustment is actually implemented this amount will be included in the 5 Year Plan on the line “Additional revenue”.

The JTA-EC recognized that Argos is at a watershed moment when the Tariff needs to be evaluated. The drive to be user friendly in a world with multiple service provider competitors has become necessary.

### **3 Review of the JTA Operating Principles (see Record of Decisions JTA-XXXIV, Annex XI)**

#### **3.1 History & Purpose of JTA**

The JTA-EC agreed upon the need to strengthen the formal registration procedures for participants in the JTA meetings. Since the JTA discussions and decisions involve committing Nations to a tariff structure for their users, it is critical that Argos JTA ROCs have the authority to do so from their country. While formality through the IOC and WMO Secretariats is required to unambiguously identify ROCs, the recruitment of ROCs is probably best handled by the CLS, who have direct access to the Argos users of each country. It is recommended that countries be required to confirm who their ROCs are.

**ACTION 6:** CLS to update ROC list and provide mailing list. (CLS, July. 2015)

**ACTION 7:** IOC & WMO Secretariats to send letters requesting ROCs to re-affirm their official designation as their national ROC. (IOC, WMO, Aug. 2015)

Participation of ROCs in JTA is uneven, with some of the heaviest user states not regularly represented. The JTA-EC discussed ways to improve active participation in governance of the JTA, especially among members with a great stake in the deliberations. The JTA-EC recognized the issue, and noted that the executive committee was created to assure continuity and representation for the largest users. The chair has the right to appoint members to assure proper balance.

The Executive Committee reviewed JTA Operating Principles. Amendments based on the transfer of continuing Action Items to operating principles will be presented to the JTA-35.

#### **3.2 The ToR of the Executive Committee.**

The Satcom recommended and the 5th Bio-logging Science Symposium (<http://bls5.scienceconf.org>) endorsed the establishment of a working group to represent the wildlife tagging community and address issues including the perception of an inequity of tariff plans between the wildlife tagging community and other Argos users. This ATAG user group can naturally become a RUG for JTA. The chair Kim Holland, could be offered a position on the JTA EC, which will strengthen the presence of wildlife users on the EC and aid the establishment of the ATAG, by providing more legitimacy as the representative organization of the community.

The EC discussed the qualification of Holly Lourie, a CLS Australia employee, to represent the users of Australia, pending another Australian Argos user nomination. The EC agreed that Holly Lourie could be designated as interim ROC for Australia, and could in such capacity serve on the Executive Committee.

**ACTION 5a:** CLS to contact Australia BOM to approve the designation of Holly Lourie as ROC for Australia. (CLS (B. Woodward) JTA-35)

**ACTION 5b:** The ATAG must apply for RUG status. (JTA Chair and K. Holland, JTA-35)

**ACTION 5c:** The JTA Chair to nominate two candidates for membership of the EC: Kim Holland as Representative of User Group, ATAG; and Holly Lourie as ROC if confirmed by BOM (JTA Chair, JTA-35)

The EC also recommends that the present members of the EC, Eric Locklear, Johann Stander and Salim Javed, should be nominated to continue on the EC for second terms. The complete slate to be recommended to the JTA-35:

Johann Stander (South Africa) elected 2013, end of first term 2015, to continue until 2017  
Eric Locklear (USA) elected 2013, end of first term 2015, to continue until 2017  
Salim Javed (UAE) elected 2013, end of first term 2015, to continue until 2017  
Kim Holland (USA) elected 2015, end of first term 2017, (could continue until 2019)  
Holly Lourie (Australia) elected 2015, end of first term 2017, (could continue until 2019)

#### **4 User Presentations**

There were no user presentations at the JTA-EC-12.

#### **5 Preparation for JTA-XXXV**

##### **5.1 Draft Agenda**

The JTA-XXXV draft agenda was amended to include items for: “Feedback from International User Conference on Argos Wildlife Applications”; “The Argos JTA Proposed Strategy Framework”; “Approval of the ToRs of Technical Advisory Group (TAG) for Wildlife Argos Applications”; and “Introductory Entry Packages for Developing Countries & SIDS“. (Annex V) The annotated agenda will be amended accordingly.

##### **5.2 Documentation Plan**

An additional document for the “Argos JTA Strategy Framework“ was added (Annex IV).

##### **5.3 National Reports Format**

The national reports format will be reconsidered to make them more effective.

**ACTION 8:** Propose possible changes to National Report Format: (CLS- Yann, Johan, JTA-35).

## **6 Any Other Business**

### **6.1 Next Meeting of the JTA EC and JTA**

The EC agreed that scheduling of future EC and JTA sessions should be arranged to take advantage of complementary meetings in such a manner as to minimize costs and maximize community involvement. JTA-EC-13 will be held in Geneva, immediately following JTA-35.

#### **Date, Place and Duration of JTA-36**

The JTA-36 will be held Oct. 2016, location to be determined.

### **6.2 Status of Action Items from JTA-XXXIV**

The meeting reviewed action items from past JTA Sessions (see Annex III). The meeting decided to recommend the JTA transfer ongoing actions to the JTA Operating Principles.

### **6.3 Review Draft EC 12 Report**

The draft report of JTA-EC-12 was discussed. It was decided to continue review and seek approval by correspondence.

## **7 Closure of the Meeting**

The chair thanked the Executive Committee for a substantive and effective meeting. The JTA-EC thanked the host, Eric Locklear for the pleasant meeting facilities and activities. The meeting was adjourned at 11:30 on July 17, 2015.

---

**ANNEX V**

**JTA CHAIRMAN'S REPORT OF THE 34<sup>TH</sup> ARGOS JTA MEETING AT THE 49TH OPSCOM COMMITTEE MEETING (Saint Emilion, France, 2015)**

H. Programs, Admissions and Finances

H-1. Programs

H-1-1. Report on JTA Meeting

Eric Locklear opened his presentation with a discussion regarding the presentation contents, which were as follows:

- 1) Close-Out the 2010 FYP and adopt the 2015 FYP
- 2) Continue to evolve the Argos JTA Spend Plan and the JTA Operating Principles.  
Close-Out the 2010 FYP and adopt the 2015 FYP

Close-Out the 2010 FYP and adopt the 2015 FYP

=====

In Weihai, China, the FYP from 2010 - 2014 was discussed and the adoption of the 2015 - 2019 FYP was approved and subsequently transmitted to the OPSCOM in January, 2015. It was pointed out that while there is a lot of information that is presented in the FYPs, the important pieces of information for the OPSCOM can be summarized in the figures for the total revenue, total cost, the difference between these two, and the cumulated balance.

The cumulated balance is only to be viewed as an indicator of the overall JTA financial health. It is the responsibility of the Argos JTA to manage the process of analyzing the costs and revenue of the system and adjusting as necessary. Eric presented a FYP summary that charted 10 years of JTA costs and revenue and looking at the cumulated balance, a conclusion can be drawn that despite the expected loss to the JTA starting in 2017, the JTA will remain healthy because of the cumulated balance.

It was also noted that the FYPs have the following characteristics:

- 1) Costs Attributable to the JTA have decreased by approximately \$1.0M euro from 2010 - 2014.
  - 2) The new FYP is projecting a 37% decrease in large program buoy usage, but only a 34% reduction in revenue by the end of 2019.
  - 3) The new FYP is projecting an increase in Wildlife usage by 14% with a corresponding increase of 13% in revenue.
  - 4) The new FYP separates the revenue by family (Wildlife, Buoys, Floats, & Fixed Stations)
- The OPSCOM takes note of the healthy situation presented by the JTA Chair, and endorses the direction of the new Five Year Plan (2015-2019).

Continue to evolve the Argos JTA Spend Plan and the JTA Operating Principles

=====

Eric continued the discussion with the two challenges facing the JTA, which is how do you know when to increase or decrease the tariffs? Recall that the Argos JTA is a "Cost Recovery" program and now that we have revenue data by family, the challenge for the JTA will be to determine the costs allocated to each JTA family. Then it would be simpler to demonstrate to the users that they are only paying for the costs allocated to their family. While this is theoretically possible, it will be difficult to put into the report because of the complexity of the Argos finances.

Eric concluded his presentation with a discussion regarding the operating principles. Since the JTA is stable, and there is participation from principally the largest user groups at the meetings, that maybe there could be a shift to bi-annual meetings in place of annual meetings in order to be more efficient and reduce costs. This issue will be discussed further by the JTA-EC, and JTA. See Action 49-5.

H-1-2. Status of U.S. Programs

Eric Locklear opened the discussion with a graphic that compared the FYP from 2005 – 2009 with 2010 - 2014. The U.S. large buoy program is a significant part of the Argos JTA usage and revenue. He went on to discuss the current composition of the U.S. program in total and reported that the combined U.S. programs are more than 1/2 of the total JTA revenue.

Eric went on to discuss the changing PTT consumption of the U.S. programs since 2010. During this time period, Buoys dropped from 74% to 63%, and Animals increased from 17% to 29%.

Eric concluded his presentation with a projected U.S. portfolio composition by the end of 2019. In summary, the Buoy program will continue to reduce its use of Argos with a change in composition as follows: 74% in 2010, to 63% in 2014, to 45% in 2019. Conversely, the Animal programs are expected to continue increasing their use of Argos with a projected change as follows: 17% in 2010, to 29% in 2014, to 47% in 2019. In summary, by 2019, it is projected that the Animal programs will surpass the Buoy programs as the largest consumer of Argos services in the U.S. portfolio.

---

**ANNEX VI – LIST OF ACTIONS**

Note: The ongoing action items have been moved to Annex M of the Operating Principle.

**1. Status of open actions from previous JTA Sessions**

No.	Ref. (agenda item)	Action/decision item	By whom	Deadline	Status
J34#06	JTA34/ 9.3	USA ROC should seek agreement to sign for a non-fixed rate, or pay in Euros	USA ROC	JTA-35	Open; to be pursued by Eric Locklear
J34#07	JTA34/ 9.4	Review the JTA tariff to ensure it is fair, equitable and simple with respect to currency conversion	JTA-EC	JTA-35	Pending resolution of J34#06
J34#08	JTA34/ 11.2	Representation of the wildlife community will be solicited, and the Wildlife Technical Advisory Group (WTAG) will be formed.	Chair WTAG	JTA-EC 12	Process: Form WTAG with Chair as JTA-EC member. Kim Holland proposed for Chair.

**2 – Status of open actions from previous JTA-EC meetings**

No.	Ref.	Action item	By whom	Deadline	Comment
JEC9#2	JEC9/2	1200 threshold issue & Wildlife large programmes: Proposal to be prepared and presented by the JTA Chair in consultation with Salim Javed (UAE) and CLS at JTA-EC-10.	Task Team on Wildlife(& S. Javed)	JTA-35	Usage should be encouraged. Conditions for benefiting from discounts to be defined (e.g. standards, funding, quantities, single organization, etc.). To be presented at JTA-34 Reassigned to Task Team on Wildlife OPEN
JEC12#0 2	JEC12/2.2.1	JTA chair to request of Satcom chair an invitation to Satcom meeting in Madrid 2016.	JTA Chair	Aug. 2015	



No.	Ref.	Action item	By whom	Deadline	Comment
JEC12#0 5b	JEC12/3.2	The ATAG must apply for RUG status.	JTA Chair and K. Holland	JTA-36	

#### 4. Actions and decisions of the present JTA-35 meeting

No.	Ref. (agenda item)	Action/decision item	By whom	Deadline	Comment
J35#1	2.3.6	to propose a new structure of the JTA assuring proper governance, and user representation	JTA-36	JTA-36	
J35#2	3.4	to develop the strategy document according to the template, in the view to submit it to the next Session of the JTA in 2016	JTA-EC	JTA-36	
J35#3	4.3	to relay the CLS feedback on the national reports to the national users, and to invite them to make use of the CLS customer care service	ROCs	JTA-36	
J35#4	4.4	to address, and to report feedback from the national reports at the next JTA Session	CLS	JTA-36	
J35#5	7.1.2	to finalize the membership of the Technical Advisory Group on Wildlife Argos Applications (TAGW) and to make a proposal at the next JTA meeting	JTA-EC	JTA-36	
J35#6	8.1.3	to provide JTA-36 with information on how flexible it is in controlling the Argos operating costs to take into account the possibility of a decline in JTA Argos usage	JTA-EC	JTA-36	

JTA-35 record of decisions, Annex VI

No.	Ref. (agenda item)	Action/decision item	By whom	Deadline	Comment
J35#7	8.3.1	to address the two issues of (i) introducing an end-to-end Entry Level kit for emerging countries, such as developing countries and SIDS for Argos, and (ii) promoting scientific activities using Argos in polar regions regions, and make a proposal at the next JTA meeting through the JTA-EC	J. Stander G. Lichota D. Meldrum Y. Bernard	JTA-36	
J35#8	10.6	to consider the recommendations of India and to report at the next JTA Session	CLS	JTA-36	
J35#9	11.3	to make sure that the invitation letters for JTA-36 will go to the Permanent Representatives of WMO and the IOC Action Addressees with the ROCs cc'ed. The letters should also include the information from the Chair on the purpose and function of the JTA	Secr.	JTA-36	
J35#10	11.9	to identify a ROC for France	CLS	JTA-36	
J35#11	11.10	to consider updating the Operating Principles to change the term of the JTA-EC members in order to better reflect a commitment to improve long term continuity of the JTA activities	JTA-EC	JTA-EC-14	
J35#12	11.11	to make proposal to the JTA-EC regarding the governance of the nomination of the ROs and ROCs for its consideration	Secretariat	JTA-EC-14	

JTA-35 record of decisions,Annex VI

No.	Ref. (agenda item)	Action/decision item	By whom	Deadline	Comment
J35#13	11.12	to develop a JTA ROC and RUG nomination package to be considered by the JTA-EC. The package will be used by the Secretariat to prepare the invitation letters to JTA meetings, and asking for nominations	JTA-EC	JTA-EC-14	

---

**ANNEX VII - REPORT ON THE 2015 AGREEMENT**  
*(submitted by CLS)*

**Table of Contents**

11. REPORT ON THE 2014 ACTIVITY .....	39
1.1. Drifting Buoys (and others buoys) activity in 2014 .....	39
1.1. Animals activity in 2014 .....	39
1.2. Floats activity in 2014 .....	41
1.3. Fixed stations activity in 2014 .....	41
1.4. 2010-2014 Five Year Plan summary .....	42
1.5. Time slot analysis for year 2014 .....	42
1.6. Impact of the 12 days unit capping in 2014 .....	43
1.7. Inactive status in 2014 .....	43
2. Extrapolated activity for 2015 .....	44
2.1. Average active PTTs per month per country: 2014 and extrapolated 2015 .....	45
2.2. Consumption per country (PTT-year): 2014 and extrapolated 2015 .....	46
2.3. Extrapolated consumption per platform category for 2015 .....	46
2.4. Consumption evolution over the last 5 years .....	48
2.5. History of the JTA participation from 1982 to 2015 .....	49

**List of Figures**

Figure 1: 2010-2015 actual activity and consumption .....	4
Figure 2: Average time slot level by platform category .....	42
Figure 3: Capping - Average PTTs affected and PTT-year "gain" by animal category .....	43
Figure 4: <b>Inactive PTTs 2014</b> .....	44
Figure 5: 2014-2015 activity comparison per platform family .....	47
Figure 6: PTT-year evolution over 5 years per platform family .....	48
<b>Figure 7: Actual consumption in PTT-years for all countries since 1982</b> .....	49

**1. REPORT ON THE 2014 ACTIVITY**

All Applications, All Countries	Average Active PTTs/Month	PTT-Year	Incomes M€uros
<b>TOTAL</b>	<b>11 587</b>	<b>2 807</b>	<b>6,89</b>

The following tables present the detailed usage of the Argos system in each country per type of platforms.

In addition to the average number of active platforms and corresponding consumption calculated in PTT-years, the third column shows corresponding annual revenue in K-€uros.

**1.1. Drifting Buoys (and others buoys) activity in 2014**

Country Name	Buoys & Others		
	Average Active PTTs/Month	PTT YEARS	Revenue €uros
AUSTRALIA	24	9,57	21 716
CANADA	26	18,33	38 210
CHINA	23	16,50	34 203
FINLAND	3	2,76	5 588
FRANCE	47	18,72	42 618
GERMANY	24	10,64	23 680
INDIA	40	25,92	54 505
ITALY	7	2,03	5 020
KOREA, REPUBLIC	1	0,10	383
NETHERLANDS	1	0,08	356
NEW ZEALAND	2	1,50	3 058
NORWAY	13	4,82	11 130
OTHERS	5	1	3 390
RUSSIAN FEDERAT	9	8,76	17 648
SOUTH AFRICA	2	0,07	518
SPAIN	20	14,47	29 969
UNITED KINGDOM	19	7,77	17 519
UNITED STATES	1640	1255,40	1 328 660
<b>Total</b>	<b>1905</b>	<b>1399</b>	<b>1 638 168</b>

**1.1. Animals activity in 2014**

Country Name	Animals		
	Average Active PTTs/Month	PTT YEARS	Revenue €uros
AUSTRALIA	301	60,41	219 585
BOTSWANA	2	0,19	844
BRAZIL	52	10,81	38 916
CANADA	1208	114,49	530 903
CHILE	17	1,82	7 941
CHINA	58	7,19	30 189
DENMARK	67	9,12	36 992
FINLAND	32	3,96	16 536
FRANCE	171	40,56	141 776
GERMANY	78	16,04	57 904
ICELAND	4	1,12	3 797
INDIA	8	1,71	6 154
ISRAEL	12	3,32	11 181
ITALY	36	7,07	25 753
KOREA, REPUBLIC OF	25	2,53	11 364
MEXICO	21	3,27	12 737
NAMIBIA	3	0,38	1 637
NETHERLANDS	45	9,60	34 459
NEW ZEALAND	25	2,85	12 349
NORWAY	77	8,68	37 545
OTHERS	16	4	14 327
PORTUGAL	19	2,53	10 348
RUSSIAN FEDERATION	34	10,53	34 920
SOUTH AFRICA	101	21,15	76 101
SPAIN	286	45,95	177 208
SWEDEN	19	2,90	11 325
SWITZERLAND	17	2,33	9 443
UNITED ARAB EMIRATES	646	145,43	514 461
UNITED KINGDOM	305	53	200 797
UNITED STATES	3471	516,79	2 039 441
<b>Total</b>	<b>7155</b>	<b>1110,17</b>	<b>4 326 930</b>

## 1.2. Floats activity in 2014

Country Name	Floats		
	Average Active PTTs/Month	PTT YEARS	Revenue €uros
AUSTRALIA	169	10,61	59 516
CANADA	21	1,19	7 095
CHINA	182	12,28	66 366
FINLAND	3	0,13	900
FRANCE	233	15,35	84 017
GERMANY	102	5,97	34 599
INDIA	75	4,90	26 908
ITALY	15	1,27	6 083
KOREA, REPUBLIC OF	76	5,59	29 055
NETHERLANDS	16	1,22	6 214
OTHERS	8	1	3 902
SOUTH AFRICA	1	0,05	313
SPAIN	25	1,54	8 707
UNITED KINGDOM	141	8	47 511
UNITED STATES	1307	105,95	384 049
<b>Total</b>	<b>2375</b>	<b>175,00</b>	<b>765 234</b>

## 1.3. Fixed stations activity in 2014

Country Name	Fixed Stations		
	Average Active PTTs/Month	PTT YEARS	Revenue €uros
AUSTRALIA	10	8,54	11 103
BRAZIL	2	2,02	2 591
CHINA	3	2,53	3 331
DENMARK	2	1,51	1 954
FINLAND	2	1,90	2 430
FRANCE	25	17,89	24 011
ITALY	11	10,12	13 074
KOREA, REPUBLIC OF	1	1,22	1 556
NETHERLANDS	35	20,40	28 703
NEW ZEALAND	1	1,00	1 275
UNITED STATES	61	56,35	72 711
<b>Total général</b>	<b>153</b>	<b>123,48</b>	<b>162 737</b>

**1.4. 2010-2014 Five Year Plan summary**

2014 was the last year of the five Year Plan 2010-2014 and here is the actual usage evolution over the past five years in term of number of active PTTs and corresponding consumption (PTT-year) compared to the initial plan worked out in 2009.

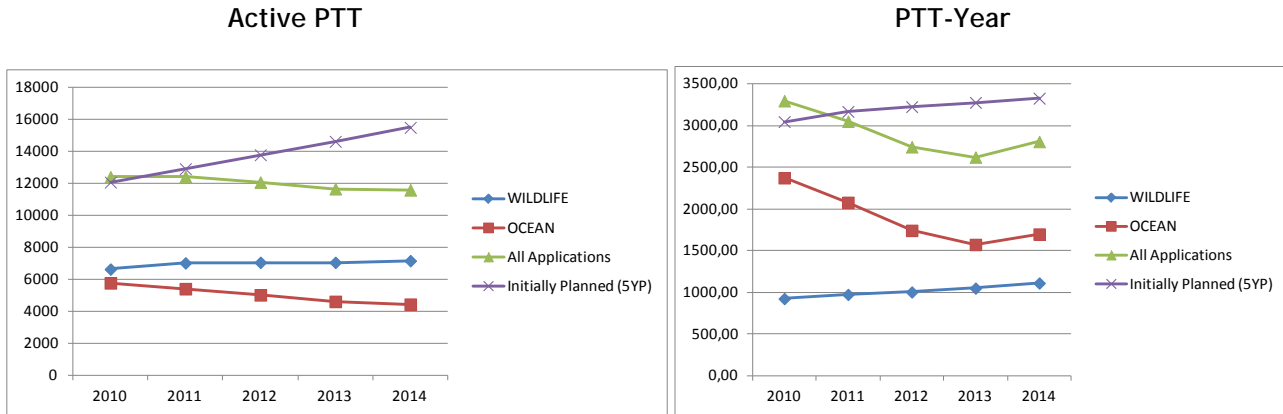


Figure 2: 2010-2015 actual activity and consumption

**1.5. Time slot analysis for year 2014**

In order to take into account the platforms' emission cycles, a system of time slots accounting has been implemented in 2005.

The day is thus divided into 4 time slots, each with a duration of 6 hours (UTC Time). Any PTT transmission collected into a given time slot produces 0.25 day units.

“Animals and Sub floats” Platforms have benefited from time slot accounting since 2005. “Buoys & Others” and “Fixed Stations” started benefiting from time slot accounting in 2007.

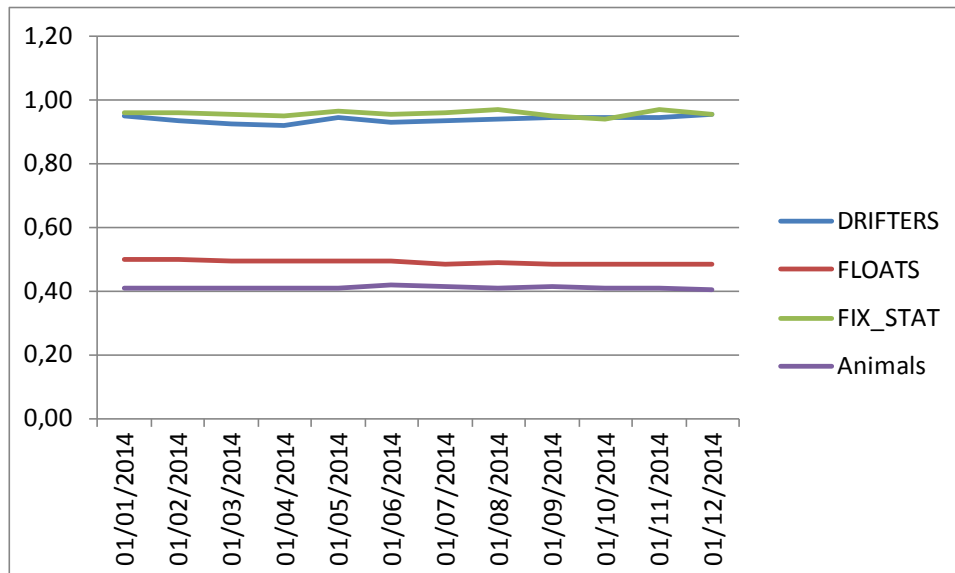


Figure 3: Average time slot level by platform category

This diagram shows the monthly evolution of the average time slot ratio for the all platforms categories.



For a given PTT, the monthly time slot ratio is calculated as the number of day units divided by the number of transmission days in the month.

It can be mentioned that “Animals” and “Sub Floats” categories are significantly benefitting from the time slots: As an average “Animals” PTT are only transmitting 41% of the day and “Sub Floats” PTT are transmitting 49% of each transmitting day. Buoys are transmitting 94% of the day and Fixed Stations 96% since they transmit data continuously throughout the day.

### 1.6. Impact of the 12 days unit capping in 2014

---

Further to JTA XXVII decision the consumption for animal platforms is capped at 12 day-units (48 time slots).

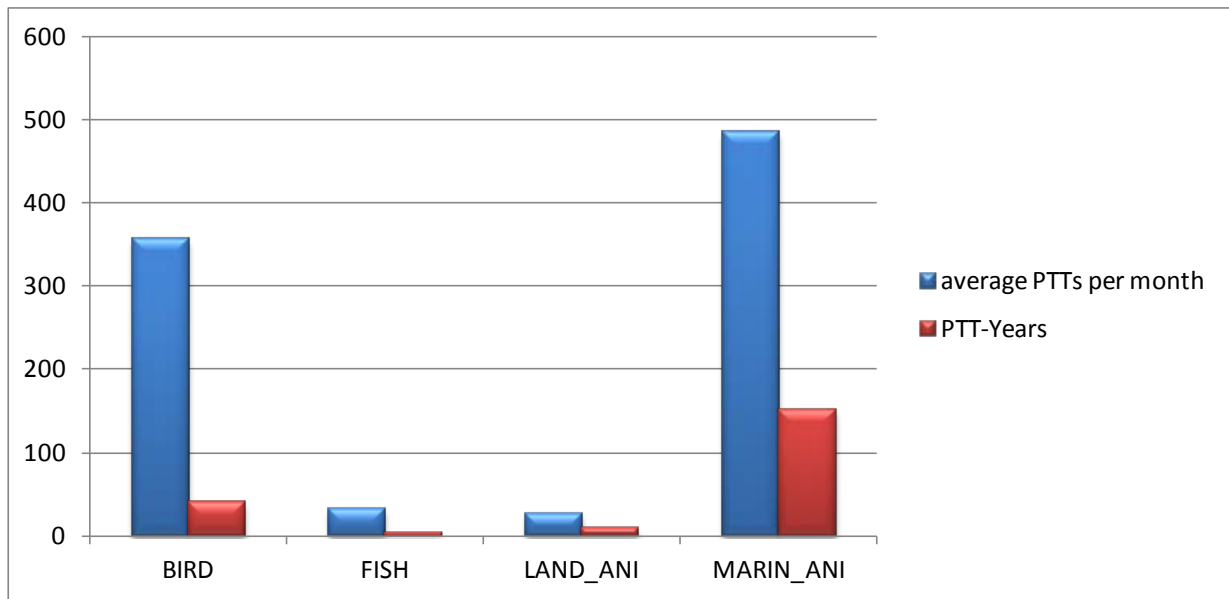


Figure 4: Capping - Average PTTs affected and PTT-year “gain” by animal category

In 2014, **904** PTTs (average active PTT per month) took advantage of the capping, representing **207.30 PTT-year**. The number of animals taking advantage of the capping is increasing by **7%** in 2014 and more particularly “Birds and Marine animals”.

### 1.7. Inactive status in 2014

---

Recall: since year 2004, transmissions from Inactive IDs are no longer charged.

As stated in the Terms and Conditions of the Global Agreement, this status is intended for those platforms that continue to transmit but for which the location or data collection are of no further use to the user or the community. The following conditions must be met to qualify:

- (1) *Inactive Status will apply if, and only if, Inactive Status is declared by the signatory of the System Use Agreement for platforms which continue to transmit beyond the programme termination. In that case, further charges will no longer be levied.*
- (2) *The platforms must have operated in Basic Service for a minimum of 2 months.*
- (3) *Data or location information cannot be retrieved nor can the platform revert to any category of service.*
- (6) *It is intended that Location and/or data collection may not be computed using a Local User Terminal or other direct readout facility.*

(7) *ID numbers of such platforms are actually returned to CLS who will recycle them after the platform stops transmitting.*

We can note that in 2014 the number of IDs processed under Inactive status continue to grow: **464 PTTs** (418 in 2013) are counted every month representing **125 PTT-year** (114.77 in 2013).

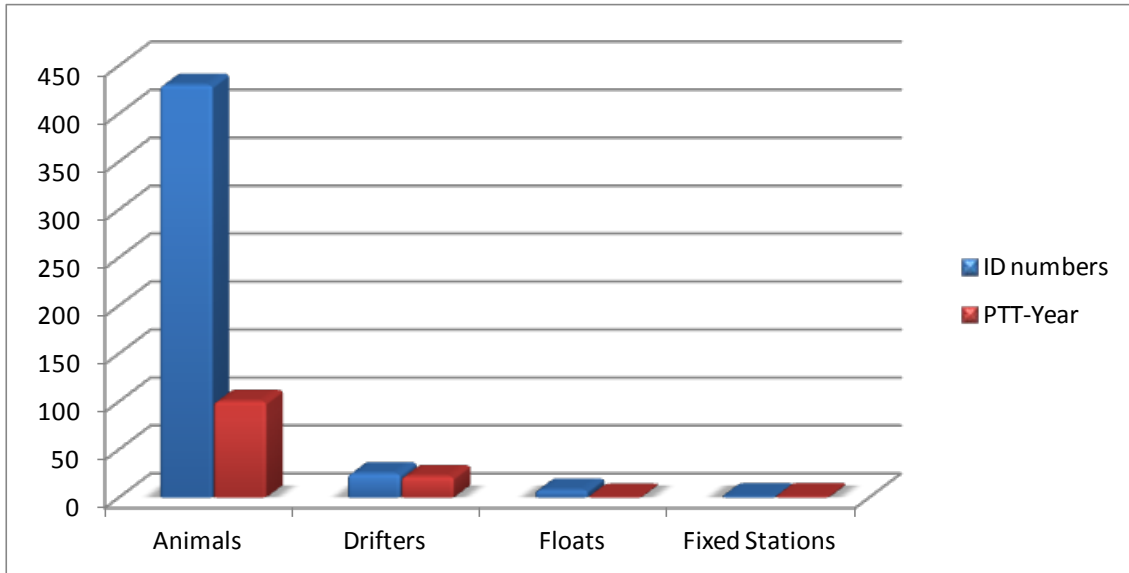


Figure 5: Inactive PTTs 2014

As mentioned in previous JTA reports, these PTTs which are unused but are still transmitting are increasing the system occupancy. CLS keeps highlighting this to the users and manufacturers encouraging them to program their PTTs only for the duration of the experiment.

## 2. Extrapolated activity for 2015

Here follows the expected usage for 2015 based on the activity of the first 7 months (January-July) 2015.

## 2.1. Average active PTTs per month per country: 2014 and extrapolated 2015

Country Name	Average 2014 Active PTTs/Month	Extrapolated Active PTTs/Month 2015
AUSTRALIA	504	442
BRAZIL	55	89
CANADA	1256	1185
CHILE	17	13
CHINA	266	278
DENMARK	68	67
FINLAND	40	38
FRANCE	476	585
GERMANY	203	266
INDIA	123	121
ITALY	69	63
KOREA, REPUBLIC OF	103	135
MEXICO	21	25
NAMIBIA	3	2
NETHERLANDS	98	171
NEW ZEALAND	28	11
NORWAY	89	80
OTHERS	28	58
PORTUGAL	31	9
RUSSIAN FEDERATION	43	37
SOUTH AFRICA	104	88
SPAIN	330	276
SWEDEN	19	11
SWITZERLAND	17	19
UNITED ARAB EMIRATES	646	676
UNITED KINGDOM	465	464
UNITED STATES	6478	6573
<b>TOTAL</b>	<b>11582</b>	<b>11781</b>

An active PTT is a PTT which transmitted at least once in a month. The average is the total number of Active PTTs divided by number of months.

Based on the actual activity from January to July 2015, extrapolated until December 2015, the number of active platforms is expected to increase globally by .3

**2.2. Consumption per country (PTT-year): 2014 and extrapolated 2015**

Country Name	Actual PTT-Year 2014	Extrapolated PTT-Year 2015
AUSTRALIA	89,12	75,22
BRAZIL	13,31	25,86
CANADA	134,02	119,76
CHILE	1,82	1,89
CHINA	38,50	42,34
DENMARK	10,63	11,10
FINLAND	8,76	8,73
FRANCE	92,52	118,95
GERMANY	32,65	51,62
INDIA	32,52	27,39
ITALY	20,48	18,78
KOREA, REPUBLIC OF	9,45	14,63
MEXICO	3,27	2,46
NAMIBIA	0,38	0,10
NETHERLANDS	31,30	46,03
NEW ZEALAND	5,35	3,15
NORWAY	13,51	11,92
OTHERS	10,57	8,47
PORTUGAL	2,53	0,79
RUSSIAN FEDERATION	19,28	11,90
SOUTH AFRICA	21,27	14,76
SPAIN	61,96	47,97
SWEDEN	2,90	1,77
SWITZERLAND	2,33	2,50
UNITED ARAB EMIRATES	145,43	154,91
UNITED KINGDOM	69,14	66,88
UNITED STATES	1934,48	2048,21
<b>TOTAL</b>	<b>2807,48</b>	<b>2938,10</b>

The PTT-years are the numbers of day units with time slot calculation where appropriate divided by 365 days.

Based on the actual activity from January to July 2015, extrapolated until December 2015, it is estimated there will be **4.7%** increase in number of PTT-Years compared to 2014 usage.

**2.3. Extrapolated consumption per platform category for 2015**

The following analysis is based on 7 months of system usage (from January to July 2015).

The total number of active PTTs should slightly increase in 2015 compared to 2014 as summarized in the following table (194 additional PTTs representing + 1.67%). The decreasing number of floats is compensated by the number of platforms deployed on buoys and animals.

Active PTTs	Actual 2014	Extrapolated 2015	
Buoys & Others	1905	1986	4,25%
Floats	2375	2276	-4,17%
Animals	7155	7369	2,99%
Fixed Stations	153	151	-1,31%
<b>Total</b>	<b>11588</b>	<b>11782</b>	<b>1,67%</b>

However the corresponding usage of the system will increase in 2015 (+ 4.7%). Like in 2014, this is due to the deployment of buoys that far outweigh the floats consumptions which transmit much less in a month. Animal tracking applications continue their steady growth.

PTT-year	Actual 2014	Extrapolated 2015	
Buoys & Others	1399,00	1480,00	5,79%
Floats	175,00	167,00	-4,57%
Animals	1110	1170,00	5,41%
Fixed Stations	123,00	122,00	-0,81%
<b>Total</b>	<b>2807</b>	<b>2939</b>	<b>4,70%</b>

The following graphs present the 2014 activity and forecast 2015 including the weight of each category of platform in term of active PTTs and corresponding system usage:

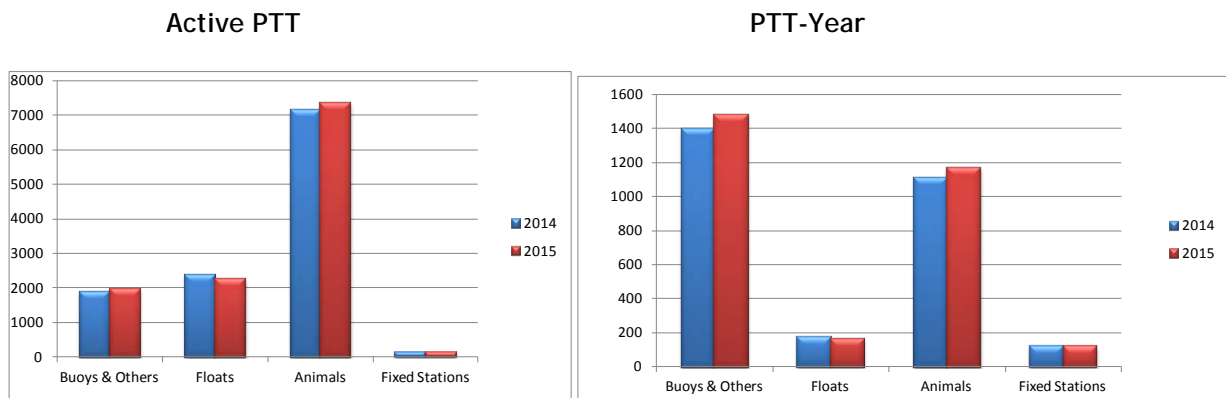


Figure 6: 2014-2015 activity comparison per platform family

The PTT-years picture shows the differences in terms of actual consumption among categories:

- Consumption of “Buoy and Others” has been decreasing since 2010. However, since 2013 this trend is reversing due to deployment of more buoys with longer lifetimes. This category still represents the highest consumption compared to the other categories.
- Consumption of “Animals” continue to progress. This year the animal consumption increase is expected to be **5%**.

- “Floats” consumption should continue to decrease by 8 PTT-years (-4.57 %) compared to 2014.
- “Fixed Stations” consumption remains quite stable, even if this category represents only 4% of the total agreement.

**2.4. Consumption evolution over the last 5 years**

The monthly evolution per category of platforms from 2010 to July 2015 is presented here under:

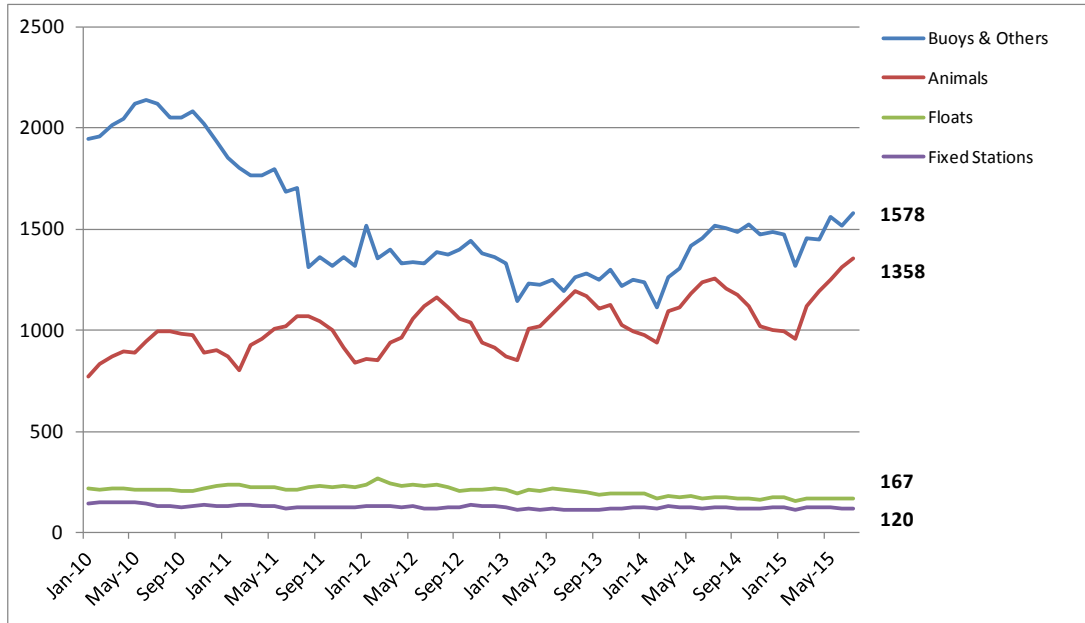
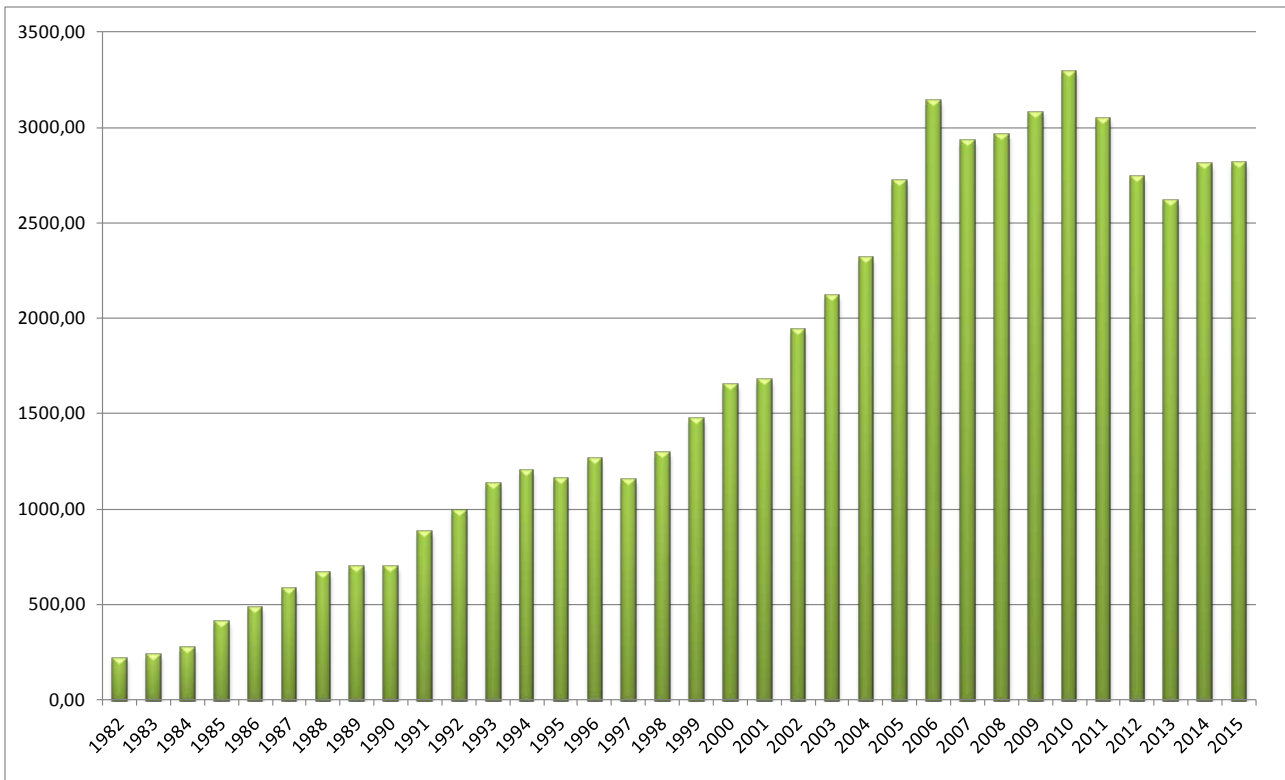


Figure 7: PTT-year evolution over 5 years per platform family

**2.5. History of the JTA participation from 1982 to 2015**



**Figure 8: Actual consumption in PTT-years for all countries since 1982**

**Notes:**

- 1) Consumption decreased in 2007 (~46 PTT-year) by applying the time slots to all categories.
- 2) In 2008 and 2009, the consumption in PTT-years decreased by ~138 PTT-years due to the capping mechanism being applied to all animals, and also by applying the time slots to all categories.
- 3) The increase in 2010 is due to a combination of increased animal program activity and maximum deployment opportunities with increased buoy lifetimes for the Global Drifter program.
- 4) The decrease in consumption since 2011 is due to a combination of both premature buoy failures in the Global Drifter program and migration away from Argos.
- 5) Value for 2015 is a projection based on actual consumption from January to July 2015: We can notice a trend of growth in the total usage which is mainly due to new deployments of buoys (as in 2014) and the continuous development of the animal tracking applications.

## ANNEX VIII

**REPORT ON 2013-2014 OPERATIONS AND SYSTEM IMPROVEMENTS**  
(Submitted by CLS)

**Report on Argos 2014 – 2015 Operations and Developments**

**List of Contents**

1 2014-2015

1.1	Operations	53	
1.2	System developments	53	
1.3	Outlook	53	
<b>2</b>	<b>Argos space segments</b>	<b>54</b>	
2.1	Operational status	54	
2.2	METOP-A HRPT Switch Zone	54	
2.3	Ascending Nodes Local hour	55	
2.4	Argos payloads anomalies in 2014-2015		<b>Error! Bookmark not defined.</b>
2.5	Maneuvers in 2014 and 2015		<b>Error! Bookmark not defined.</b>
<b>3</b>	<b>Argos ground segment</b>	<b>57</b>	
3.1	Global antennas (store and forward mode)	57	
3.2	Regional antennas (real-time mode)	58	
	3.2.1. Operation and improvements	58	
	3.2.2. METOP real-time coverage	61	
	3.2.3. HRPT-A4 project	62	
3.3.	Processing centers	63	
	3.3.1. Argos global processing centres architecture	65	
	3.3.2. The CLS Argos processing chain	66	
	3.3.3. The Oracle database	67	
	3.3.4. ArgosWeb site	67	
	3.3.5. ArgosServer	68	
	3.3.6. ArgosDirect	69	
	3.3.7. Argos WebService	70	
	3.3.8. Disaster recovery architecture	71	
	3.3.9. Data processing statistics	71	
	3.3.10. Number of Argos messages and locations processed	72	
	3.3.11. Argos location and data collection latencies	73	
	3.3.12. Monthly active Argos platforms	75	
	3.3.13. GTS processing	75	
3.4.	System improvements	77	
3.5.	Argos-4 ground segment upgrade	80	
<b>4.</b>	<b>Argos Users applications</b>	<b>83</b>	
4.1.	Monitoring Argos platforms	83	
4.2.	CLS Argos report for JCOMMOPS	83	
4.3.	Argos data timeliness	84	
4.4.	Background noise measured in the Argos frequency band	86	
4.5.	Argos Platforms and related System Occupancy	86	
4.6.	Argos-3 in DBCP		<b>Error! Bookmark not defined.</b>
4.7.	Argos-3/Argos-4 chipset	88	
4.8.	The RXG-134 Argos Goniometer	89	



## List of Figures

<b>Figure 1 Argos Constellation .....</b>	<b>54</b>
<b>Figure 2 : METOP-A HRPT Extended Switch Zone (Descending and Ascending orbits) .....</b>	<b>55</b>
<b>Figure 3: Local Equator crossing time in April 2015 .....</b>	<b>56</b>
<b>Figure 4 : The Argos Global antenna network (without McMurdo) .....</b>	<b>57</b>
<b>Figure 5 : METOP-B Mc Murdo Global antennas coverage and principle .....</b>	<b>58</b>
<b>Figure 6 : May 2015 Argos Real-time coverage map .....</b>	<b>58</b>
<b>Figure 7 : List for Operational Antennas on April 2015 and tracked satellites .....</b>	<b>60</b>
<b>Figure 8 : Operational Argos real-time antennas since January 2008.....</b>	<b>60</b>
<b>Figure 9 : NOAA/METOP/SARAL Playback and Real-time datasets processed per Month.....</b>	<b>61</b>
<b>Figure 10 : Current METOP real-time coverage.....</b>	<b>61</b>
<b>Figure 11 : Argos HRPT-A4 network.....</b>	<b>62</b>
<b>Figure 12 : Global and Regional Processing Centers.....</b>	<b>63</b>
<b>Figure 13 : CLS Toulouse new building .....</b>	<b>64</b>
<b>Figure 14 : CLS Toulouse Control Room .....</b>	<b>64</b>
<b>Figure 15 : CLS Global Processing Data Center .....</b>	<b>65</b>
<b>Figure 16 : CLS Toulouse and CLS America IT architecture .....</b>	<b>66</b>
<b>Figure 17: Synoptic of the CLS Argos processing chain .....</b>	<b>67</b>
<b>Figure 18 : ArgosWeb availability in 2014.....</b>	<b>68</b>
<b>Figure 19 : Number of daily ArgosWeb visits in 2014.....</b>	<b>68</b>
<b>Figure 20 : ArgosServer availability in 2014 .....</b>	<b>69</b>
<b>Figure 21 : Number of ArgosServer requests in 2014 .....</b>	<b>69</b>
<b>Figure 22 : Daily number of files sent by ArgosDirect in 2014 .....</b>	<b>70</b>
<b>Figure 23 : Argos WebService availability in 2014.....</b>	<b>70</b>
<b>Figure 24 : Number of Argos WebService connections in 2014.....</b>	<b>71</b>
<b>Figure 25 : Disaster Recovery Room located in CNES.....</b>	<b>71</b>
<b>Figure 26 : Argos processing chain availability in 2014 .....</b>	<b>72</b>
<b>Figure 27 : Argos messages and locations per day (table view).....</b>	<b>73</b>
<b>Figure 28 : Argos messages and locations per day (Chart view).....</b>	<b>73</b>
<b>Figure 29 : Average latency on Argos data collection for sample platforms* since 2008 .....</b>	<b>74</b>
<b>Figure 30 : Average latency on Argos locations for sample platforms* since 2008 .....</b>	<b>74</b>
<b>Figure 31 : Data available in 1 hour .....</b>	<b>75</b>
<b>Figure 32: Monthly active Argos platforms in 2014 .....</b>	<b>75</b>
<b>Figure 33: Number of GTS observation processed per day in 2014 .....</b>	<b>76</b>
<b>Figure 34: Argos platforms GTS processed per day from August 2014 to August 2015</b> Error! Bookmark not defined.	
<b>Figure 35: Argos drifters GTS processed per day from August 2014 to August 2015</b> Error! Bookmark not defined.	
<b>Figure 36: Daily number of GTS BUFR bulletins produced from August 2014 to August 2015</b> Error! Bookmark not defined.	
<b>Figure 37: Daily average delivery time for all GTS platforms from August 2014 to August 2015</b> Error! Bookmark not defined.	

<b>Figure 38 : Improvements of the orbitography accuracy</b> .....	<b>78</b>
<b>Figure 39 : Screenshot of the new ArgosWeb home page</b> .....	<b>79</b>
<b>Figure 40 : Screenshot of the new web mapping tool</b> .....	<b>80</b>
<b>Figure 41: Monthly active ocean Argos platforms statistics</b> .....	<b>83</b>
<b>Figure 42 : Active Argos platforms repartition (June 2015)</b> .....	<b>83</b>
<b>Figure 43 : Argos data mean disposal time diagram</b> .....	<b>84</b>
<b>Figure 44 : Argos Data Mean Disposal Time in May 2014 (in minutes)</b> .....	<b>85</b>
<b>Figure 45 : Argos Data Mean Disposal Time in July 2015 (in minutes)</b> .....	<b>85</b>
<b>Figure 46 : Minimal level of reception in the Argos frequency band in April 2015</b> .....	<b>86</b>
<b>Figure 47 : Map of Argos platforms deployment</b> .....	<b>87</b>
<b>Figure 48 : System Occupancy on 20/05/2014</b> .....	<b>87</b>
<b>Figure 49: System Occupancy on 22/04/2015</b> .....	<b>88</b>
<b>Figure 50 : Number of monthly active Argos-3 drifters in DBCP</b> .....	<b>Error! Bookmark not defined.</b>
<b>Figure 51 : Argos-3/4 chipset pictures</b> .....	<b>89</b>
<b>Figure 52 : The new Argos goniometer</b> .....	<b>90</b>

## 1 2014-2015 Argos Highlights

---

### 1.1 Operations

---

- Cartography servers have been upgraded and virtualized in 2015.
- The second phase of the upgrade of the Oracle database (to version 11GR2) with new optimizer has been carried out.
- The orbitography new processing chain is now running on Unix VM in replacement of the OpenVMS server
- BCH decoding by CTA for message correction (compatible coding to be implemented by Manufacturers)
- New earth elevation model (ACE3) for Kalman location
- Argos WebServices new functionalities (observation, program/platform detail, PMT command)
- CLSA: major upgrade of the system infrastructures (traffic management & security improved, processing center upgraded, virtualized servers implemented, etc.)

### 1.2 System developments

---

- SHARC (Satellite High-performance Argos-3/-4 Receive/transmit Communication) chipset development project - Work in progress
- 2 new ground HRPT Argos stations added in 2014-2015: Ascension Island & Libreville (Gabon), and 3 stations upgraded: Muscat (Oman), Monterey & Hawaii (USA)
- Integration of a new BUFR sequence for drifting & moored buoys in the Argos processing chain

### 1.3 Outlook

---

- Online Argos LOC reprocessing ordering/downloading. (LS/Kalman/Smoothing)
- New reference beacon monitoring component, to monitor the data reception quality.
- New Argos Loc Quality Monitoring Component, to control the quality of the Argos Doppler location system.
- End of 2015: the new Argos Web user interface and cartography systems should be released: entirely redesigned (responsive design compatible with all web browsers, tablets and smartphones), with new services, and upgraded functionalities.
- The Argos real-time antenna network upgrade project continues (planned stations) :
  - Athens (Greece): discussion with Eumetsat for using EARS station for Saral.
  - Mas Palomas (Spain): discussion with Eumetsat for using EARS station for Saral.
  - Kourou (French Guyana): new station scheduled for September.

- Easter Island (Chile): new station scheduled for September 2015
- Cape Ferguson (Australia / AIMS) : upgrade planned before end of 2015
- Melbourne, Darwin, Davis and Casey (Australia / BOM): BOM has planned to replace the existing antennas with new ones, we are waiting to discuss with BOM about their integration in the HRPT network

## 2 Argos space segments

### 2.1 Operational status

On June 6<sup>th</sup> 2014, telecommand access to NOAA-16 (NL) was lost and no more telemetry received. NOAA-16 (NL) Argos-2 payload was decommissioned on June 9<sup>th</sup>, 2014 after 14 years of service.

Argos instruments are now onboard 6 POES's spacecrafts.

The status information on each spacecraft and its Argos various subsystems is described below:

Satellites	Launch date	Status	Real time data (HRPT)	Stored data (STIP)	Data AVHRR
SARAL (SR)	25-Feb-13	N/A	Ok	Inuvik, Kiruna	N/A
METOP-B (MB)	17-Sep-12	AM Primary	Ok	Svalbard, McMurdo	Ok
METOP-A (MA)	19-Oct-06	AM Backup	Ok*	Svalbard	Ok
NOAA-19 (NP)	06-Feb-09	Prime Services Mission (ADCS,SARSAT) <i>PM Primary is now Suomi-NPP for other products</i>	Ok	Gilmore, Wallops, Svalbard	Ok
NOAA-18 (NN)	20-May-05	PM Secondary	Ok	Gilmore, Wallops	Ok
NOAA-15 (NK)	13-May-98	AM Secondary	Ok	Gilmore, Wallops	Ok

\* Scheduled activities are defined on Orbit Switch ON and Switch OFF (see below for more details).

**Figure 9 Argos Constellation**

### 2.2 METOP-A HRPT Switch Zone

To minimize the risk of failure of the AHRPT-B unit whilst still offering the user community a service, EUMETSAT has implemented a "partial" AHRPT service in those areas where the risk of damage from heavy ion radiation is reduced.

For southbound passes, AHRPT side B is activated for all orbits over the North Atlantic and European area, starting at around 60°N. The AHRPT is switched off before the spacecraft reaches the Southern Atlantic Anomaly region at around 10°N.

In January 2011, EUMETSAT announced the extension of this activation zone while maintaining the same operational restrictions over the polar caps and South Atlantic anomaly. Furthermore, AHRPT operations is made in ascending orbits, but with more stringent risk reduction measures than for the descending passes, given the availability of data via the Fast Dump Extract System (FDES) to cover the Northern Hemisphere.

Figure 2 shows the extended activation zone of the AHRPT for both descending and ascending parts of the orbit. The extended AHRPT coverage is effective since 18 January 2011 as a pre-operational service.

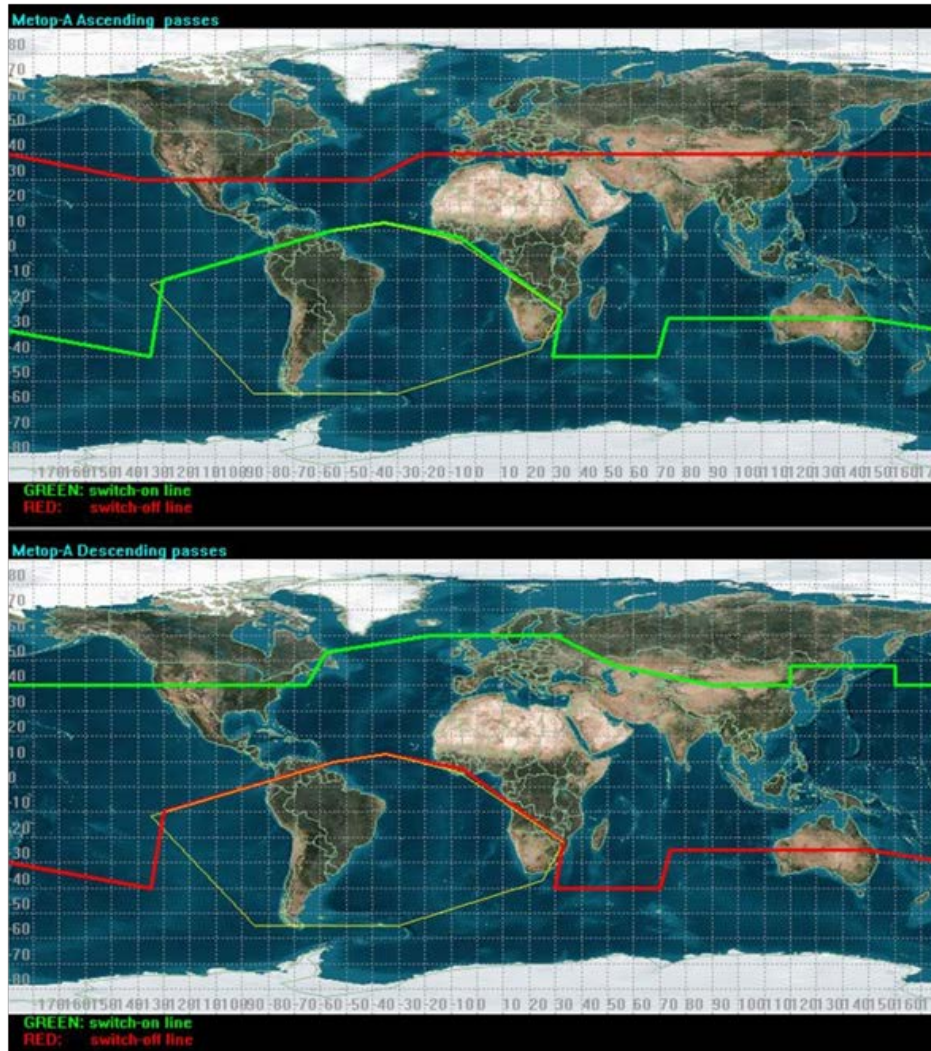


Figure 10 : METOP-A HRPT Extended Switch Zone (Descending and Ascending orbits)

### 2.3 Ascending Nodes Local hour

---

The following diagram presents the local time of ascending nodes in April 2015

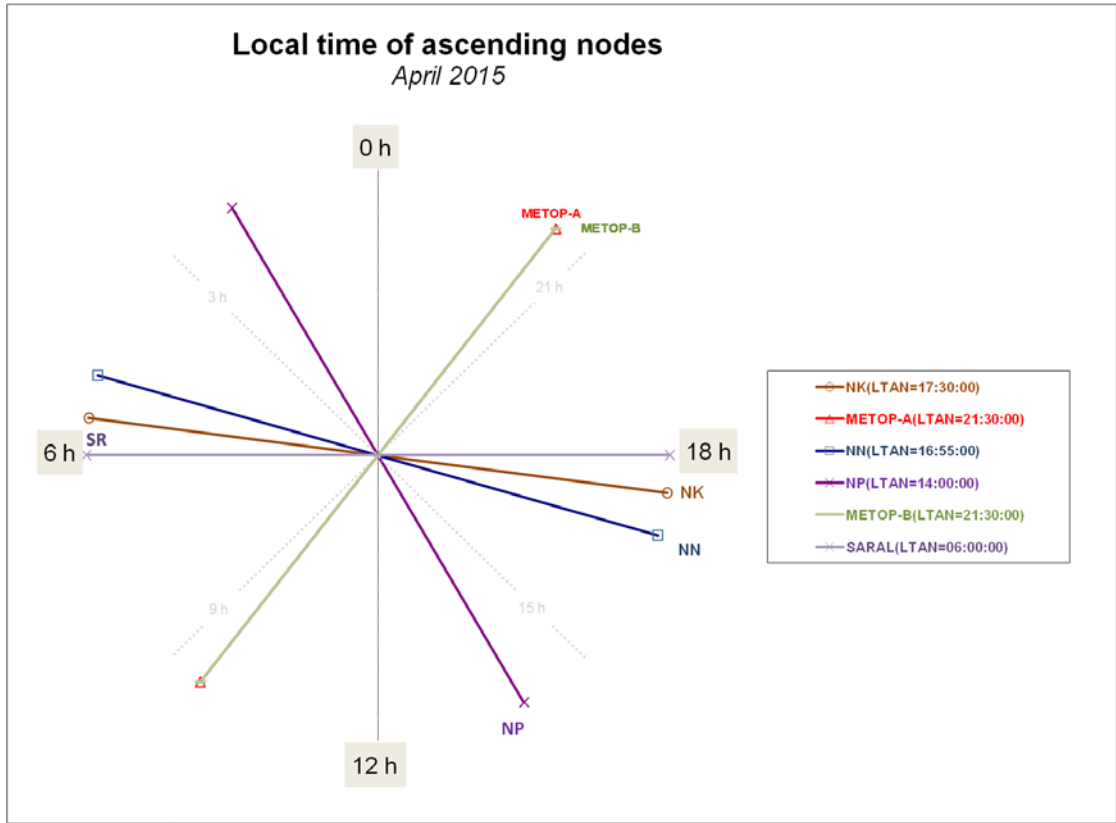


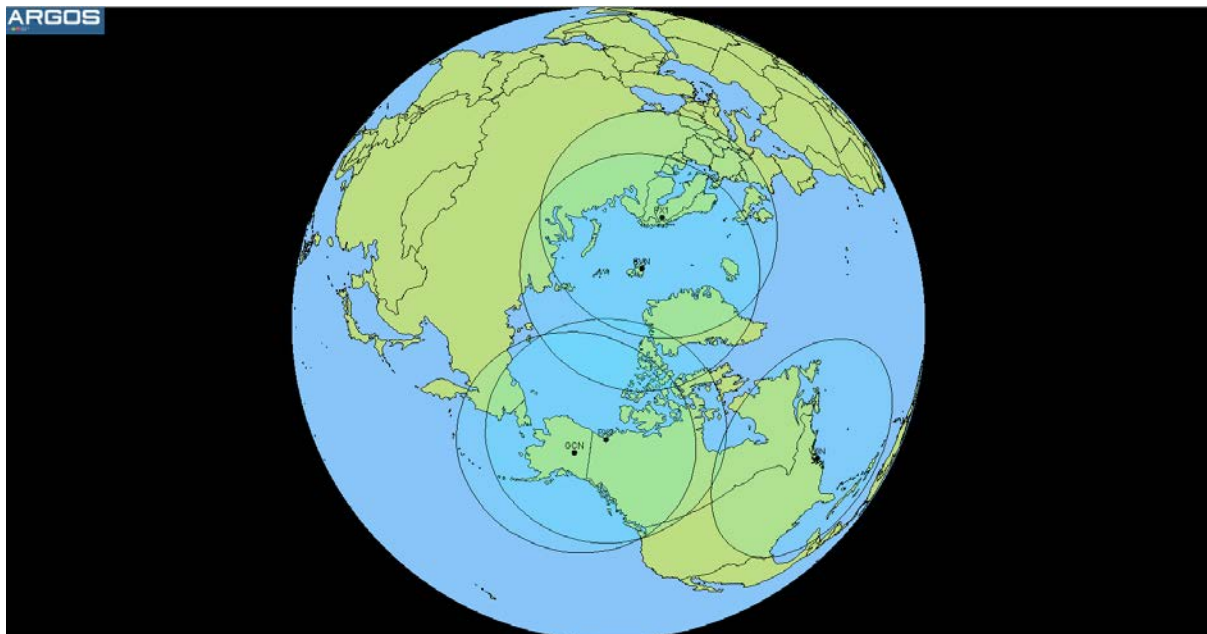
Figure 11: Local Equator crossing time in April 2015

### 3 Argos ground segment

#### 3.1 Global antennas (store and forward mode)

The Argos global antennas network comprises of seven stations:

- The two NOAA global stations of Fairbanks and Wallops acquire the global recorded telemetry transmitted by NOAA-15, NOAA-18 and NOAA-19.
- The EUMETSAT global receiving station of Svalbard acquires the global recorded telemetry transmitted by Metop-A and Metop-B as well as the 2 daily blind orbits of NOAA-19 for NOAA stations.
- The NOAA Svalbard antenna that delivers NOAA-15 and NOAA-18 blind orbits for Fairbanks and Wallops when not in conflict with NOAA-19.
- Inuvik (Canada) and Kiruna (Sweden) stations for SARAL operated by EUMETSAT.



**Figure 12 : The Argos Global antenna network (without McMurdo)**

- Data recovery from MetOp-B will occur at Svalbard and McMurdo (ADA). Timeliness benefit of McMurdo data recovery is for MetOp-B only. MetOp-A data will continue to NOAA on a best effort basis and without the timeliness benefits of half orbit dumps at McMurdo.

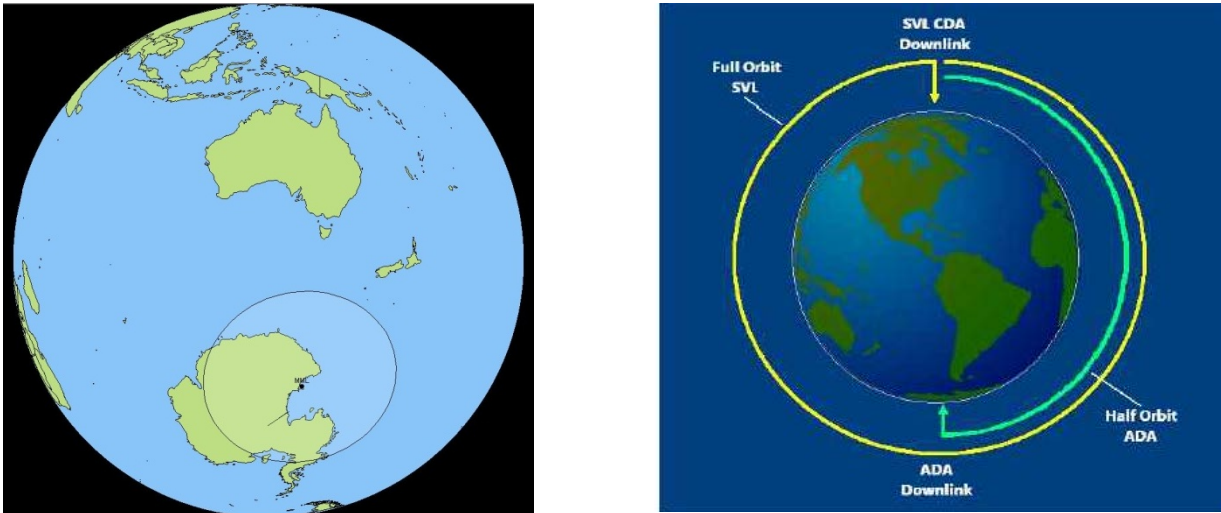


Figure 13 : METOP-B Mc Murdo Global antennas coverage and principle

### 3.2 Regional antennas (real-time mode)

#### 3.2.1. Operation and improvements

In 2015, the real-time network was upgraded with 2 new ground stations added and 3 upgraded to receive Saral:

- Ascension Island station operated by CLS
- Libreville (Gabon) station operated by CLS
- Muscat (Oman) station operated by EUMETSAT/DGMAN (upgraded for Saral)
- Monterey & Hawaii (USA) stations operated by NOAA (upgraded for Saral)

2 ground stations have been removed :

- Manas (Kirghizstan): a USAF antenna
- Oslo (Norway): due to erratic operation, replaced by Tromsø and Lannion stations

The real-time Argos ground stations network consists of about 62 antennas. Most of them are capable of receiving NOAA POES satellites data, 24 out of these 62 stations receive METOP satellites data and 14 receive also SARAL data.

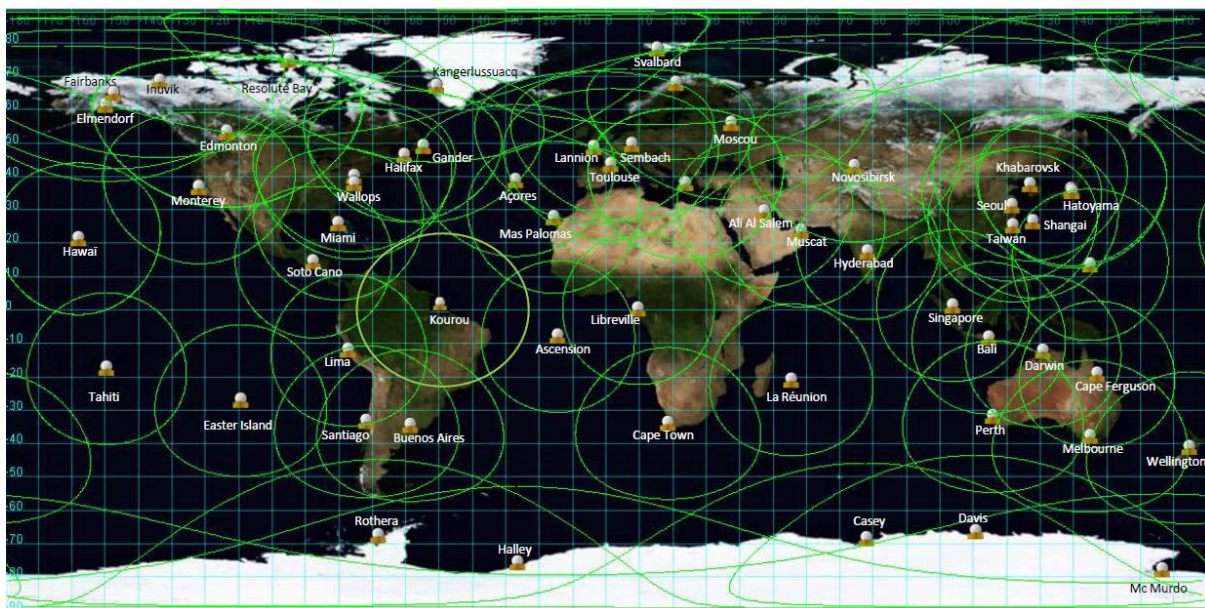


Figure 14 : May 2015 Argos Real-time coverage map



JTA-35 record of decisions,Annex VIII

Name	Code	Country	Operator	Sat					
Ascension Island	AI	UK	ROYAL AIR FORCE	NK	NN	NP	MA	MB	SR
Andersen	AN	GU	US AIR FORCE	NK	NN	NP			
Ali Al Salem	AS	KW	US AIR FORCE	NK	NN	NP			
Buenos Aires	BA	AR	INTA	NK	NN	NP			
Bali	BL	ID	PT CLS INDONESIA		NN	NP	MA		SR
Casey	CA	AU	BOM	NK	NN	NP			
Cape Ferguson	CF	AU	NOAA NESDIS		NN	NP			
Santiago	CH	CL	METEO CHILE		NN	NP			
Darwin	DA	AU	BOM	NK	NN	NP			
Davis	DV	AU	BOM	NK	NN	NP			
Edmonton	ED	CA	ENVIRONNEMENT CANADA	NK	NN	NP			
Elmendorf - Anchorage	EL	US	US AIR FORCE	NK	NN	NP			
Lannion	FL	FR	METEO-FRANCE		NN	NP	MA	MB	SR
Reunion Island HRPT4	FR	FR	METEO FRANCE	NK	NN	NP	MA	MB	SR
Libreville - N Koltang	GB	GA	CLS	NK	NN	NP	MA	MB	SR
Gilmore Creek	GC	US	NOAA NESDIS	NK	NN	NP		MB	
Sondre	GR	GL	DMI	NK	NN	NP			
Halifax	HF	CA	CANADIAN COAST GUARD	NK	NN				
Hickam - Honolulu	HI	US	US AIR FORCE	NK	NN	NP			
Halley	HR	GB	British Antarctic Survey		NN	NP			
Hatoyama	HT	JP	Jaxa	NK	NN	NP	MA	MB	SR
Hawaïi	HW	US	NOAA NWS		NN	NP	MA	MB	
Hyderabad	HY	IN	INCOIS	NK	NN	NP			
Jamstec - Tokyo	JM	JP	CUBIC-I	NK	NN				
Kandena- Okinawa	KA	JP	US AIR FORCE	NK	NN	NP			
Lajes - Portugal(Acores)	LA	PT	US AIR FORCE	NK	NN	NP			
Lima	LM	PE	CLS PERU	NK	NN	NP	MA	MB	SR
Miami	MA	US	NOAA AOML	NK	NN	NP	MA	MB	
Melbourne	ME	AU	BOM	NK	NN	NP			
Miami Capture	MI	US	CLS FR				MA	MB	SR
Mc Murdo	MM	AQ	NOAA					MB	
Monterey	MO	US	NOAA NESDIS	NK	NN	NP	MA	MB	
Wellington	NZ	NZ	NIWA		NN	NP			
Perth	PE	AU	BOM	NK	NN	NP			
Lima	PR	PE	CLS PERU	NK	NN	NP			
Polar Bande-X Saral	PX	SE	Eumetsat						SR
Resolute Bay	RB	CA	Environment Canada	NK	NN	NP			
Reunion Island	RN	FR	METEO FRANCE		NN	NP			
Rothera	RO	GB	British Antarctic Survey	NK	NN	NP			
Ramonville	RV	FR	CLS	NK	NN	NP			
Cape Town	SA	ZA	SAWB	NK	NN	NP	MA	MB	SR
Soto Cano	SC	HN	USAF	NK	NN	NP			
Séoul	SE	KR	KMA	NK	NN	NP			
Singapore	SG	SG	SMM	NK	NN	NP			

Shanghai	SH	CN	EAST CHINA SEA FISHERIES	NK	NP			
Sembach	SM	DE	US AIR FORCE	NK	NN	NP		
Svalbard	SN	NO	NOAA			NP	MA	MB
Svalbard	SV	NO	EUMETSAT				MA	MB
Svalbard NOAA	SW	US	NOAA	NK	NN			
Papeete	TA	FR	METEO-FRANCE	NK	NN	NP	MA	MB
CNES (test)	TE	FR	CLS		NN	NP		SR
Taiwan	TW	TW	NTOU	NK	NN	NP		
Valley Forge (Test)	UA	US	US AIR FORCE	NK	NN	NP		
Wallops Island	WI	US	NOAA NESDIS	NK	NN	NP		MB
Athens EARS	XA	GR	EUMETSAT		NN	NP	MA	MB
Edmonton EARS	XE	CA	EUMETSAT	NK	NN	NP		
Gander EARS	XG	CA	EUMETSAT	NK	NN	NP		
Kangerlussuaq EARS	XK	GL	EUMETSAT	NK	NN	NP		MB
Maspalomas EARS	XM	ES	EUMETSAT	NK	NN	NP	MA	MB
Muscat EARS	XO	OM	EUMETSAT EARS		NN	NP	MA	MB
Moscou EARS	XR	RU	EUMETSAT	NK	NN	NP	MA	MB
Svalbard EARS	XS	NO	EUMETSAT		NN	NP	MA	MB

Figure 15 : List for Operational Antennas on April 2015 and tracked satellites

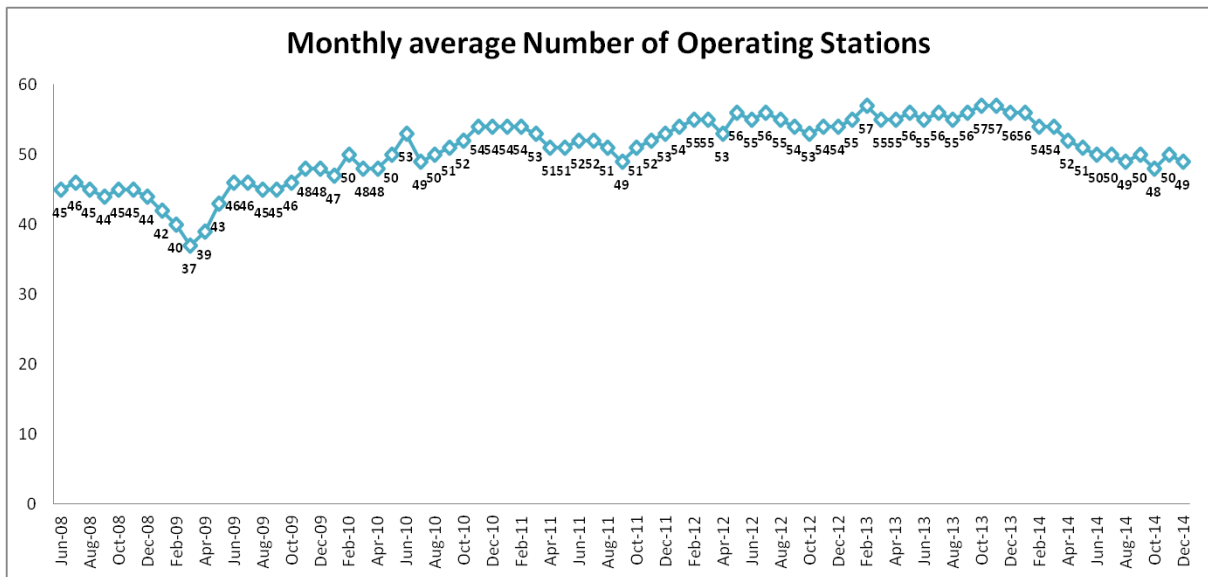


Figure 16 : Operational Argos real-time antennas since January 2008

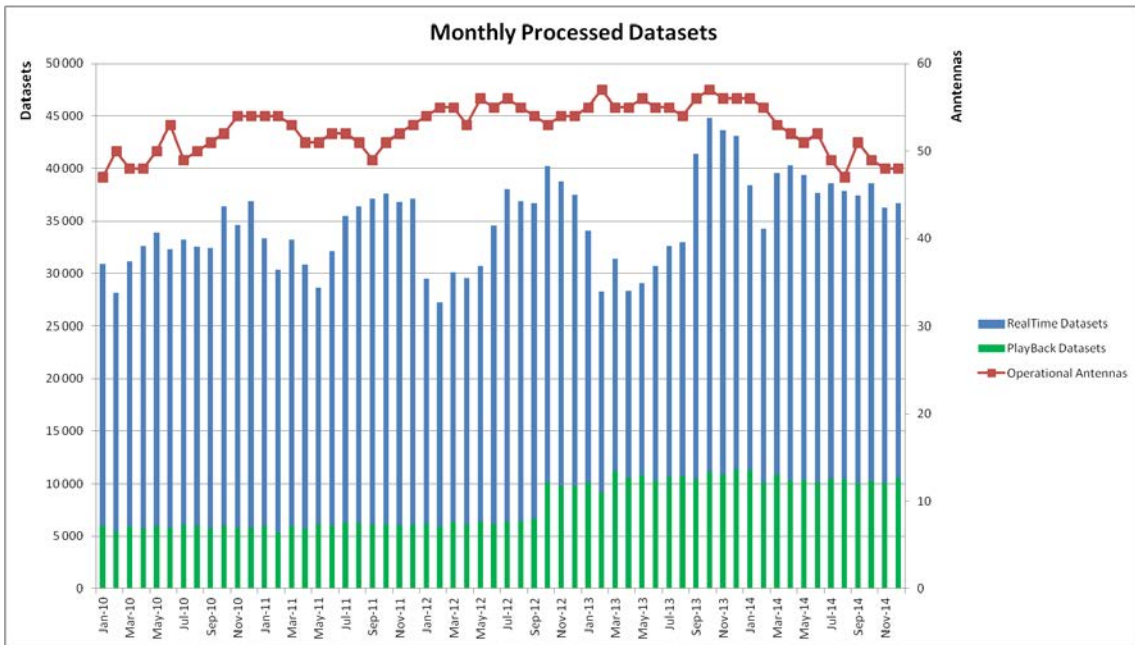


Figure 17 : NOAA/METOP/SARAL Playback and Real-time datasets processed per Month

### 3.2.2. METOP real-time coverage

All METOP HRPT compatible antennas were configured to track Metop-B except some of the EARS Station network.

- Metop-A by NOAA ESPC: Monterey, Ewa Beach, Miami
- Metop-B by NOAA ESPC: Monterey, Ewa Beach, Miami, Gilmore Creek, Wallops Island
- Metop-A by Eumetsat : EARS network except Kangerlussuaq
- Metop-B by Eumetsat : EARS network except Edmonton, Gander

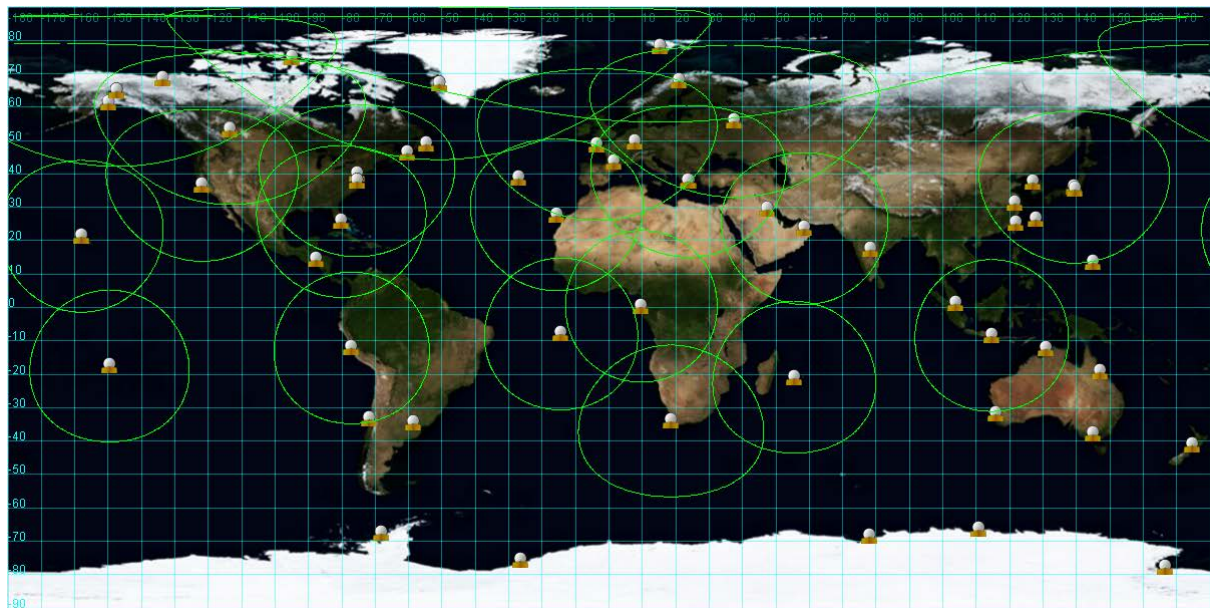
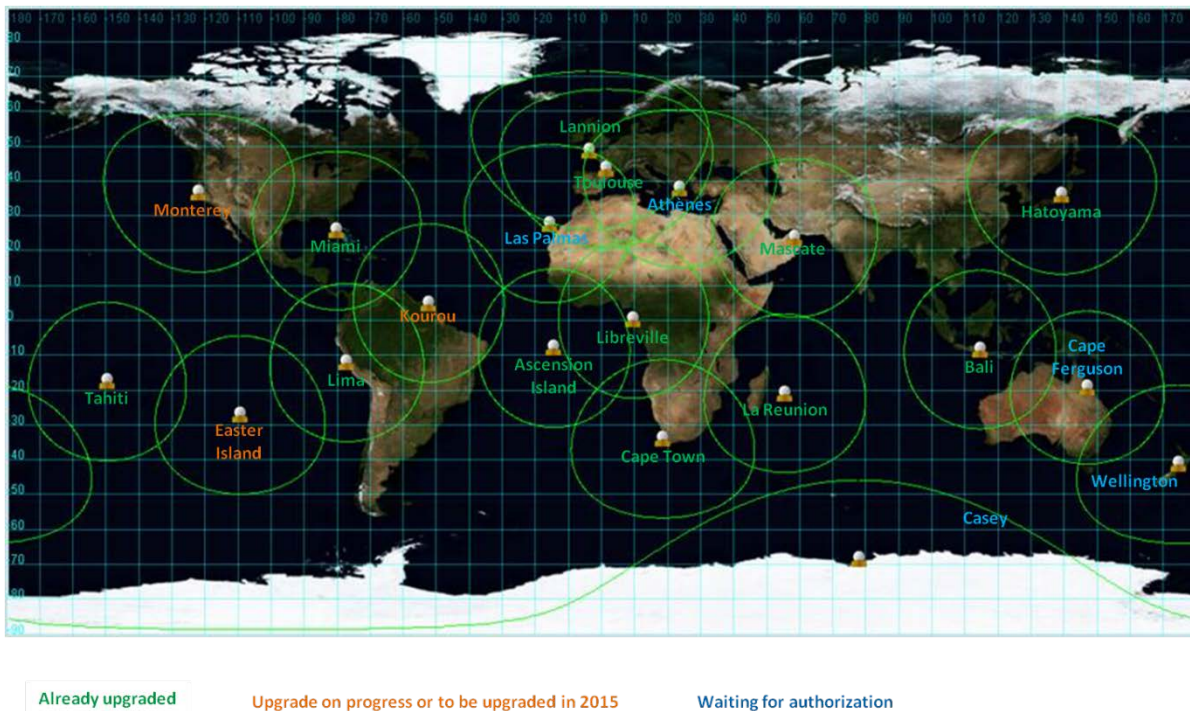


Figure 18 : Current METOP real-time coverage

### 3.2.3. HRPT-A4 project

This project was initiated in 2010 and presented for the first time at the 43<sup>rd</sup> Operation Committee. It consists in upgrading a significant part of the network so that it is capable of acquiring data from NOAA, METOP and SARAL satellites. The very flexible technology of the receiver should make it compatible with the future satellites which will carry Argos-4 payloads.

On the basis of a system study aiming at selecting the minimal subset of ground stations to be upgraded to get the better overall system performances, a group of 20 stations as shown on the map below have been chosen.



**Figure 19 : Argos HRPT-A4 network**

From an engineering point of view, all the equipment requested to upgrade an existing station has been tested and ready to be deployed. From a deployment point of view, the negotiations with the host organizations is taking much more time than expected at the beginning of the project.

In July 2015, the status of the deployment is as follows:

#### 1. Operational HRPT-A4 ground stations

- Lima (Peru)
- Lannion (France)
- La Réunion (France)
- Hatoyama (Japan)
- Miami (USA)
- Cape Town (South Africa)
- Bali (Indonesia)
- Tahiti (France)
- Toulouse (France): spare equipment
- Muscat (Oman)
- Libreville (Gabon)

- Ascension Island
- Monterey (USA)
- Hawaii (USA)

## 2. Upgrade scheduled in 2015/2016

- Cape Ferguson (Australia / AIMS): upgrade planned before end of 2015
- Mas Palomas (Spain): under discussion with EumetSat, waiting for authorization
- Athens (Greece) : under discussion with EumetSat, waiting for authorization
- Melbourne, Darwin, Davis and Casey (Australia / BOM): BOM has planned to replace the existing antennas with new ones, we are waiting to discuss with BOM about their integration in the HRPT network.

## 3. New stations scheduled for 2015

- Kourou (French Guyana): due in October 2015
- Easter Island (Chile): due in September 2015

### 3.3. Processing centers

---

The two global processing centers in Toulouse and Lanham were nominal over 2014 and first semester of 2015. Redundancy is used at least once a month (up to two times on one month). Redundancy means all Argos users rerouted to CLS or CLSA during an anomaly on the nominal global processing center.

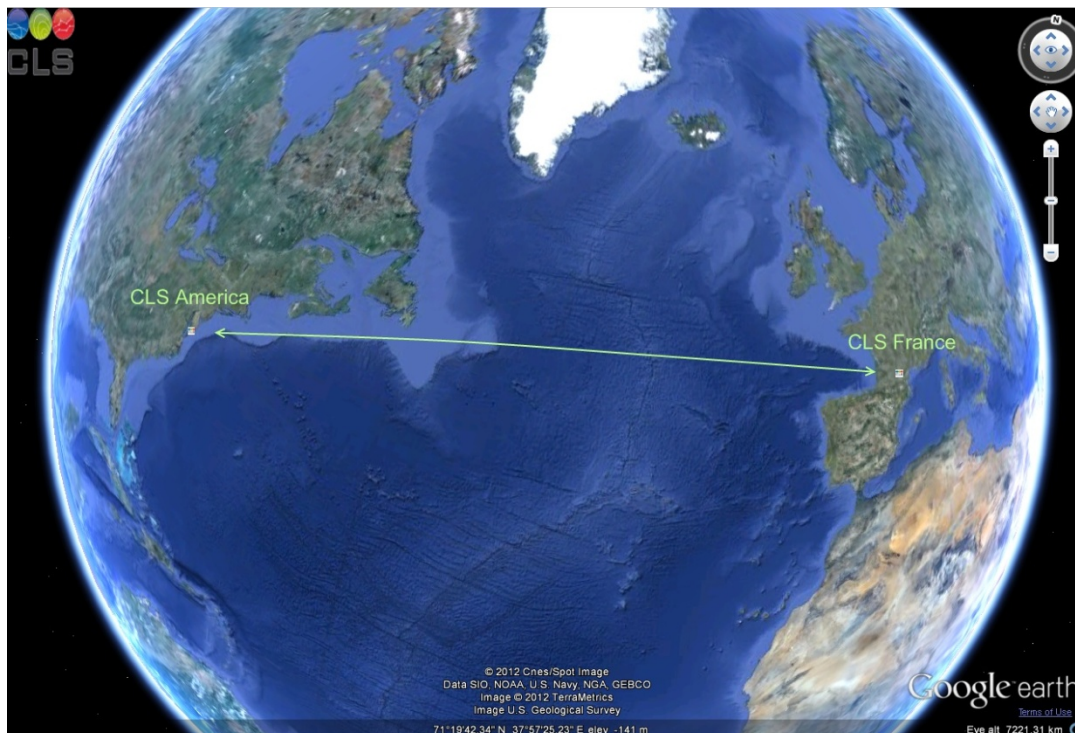
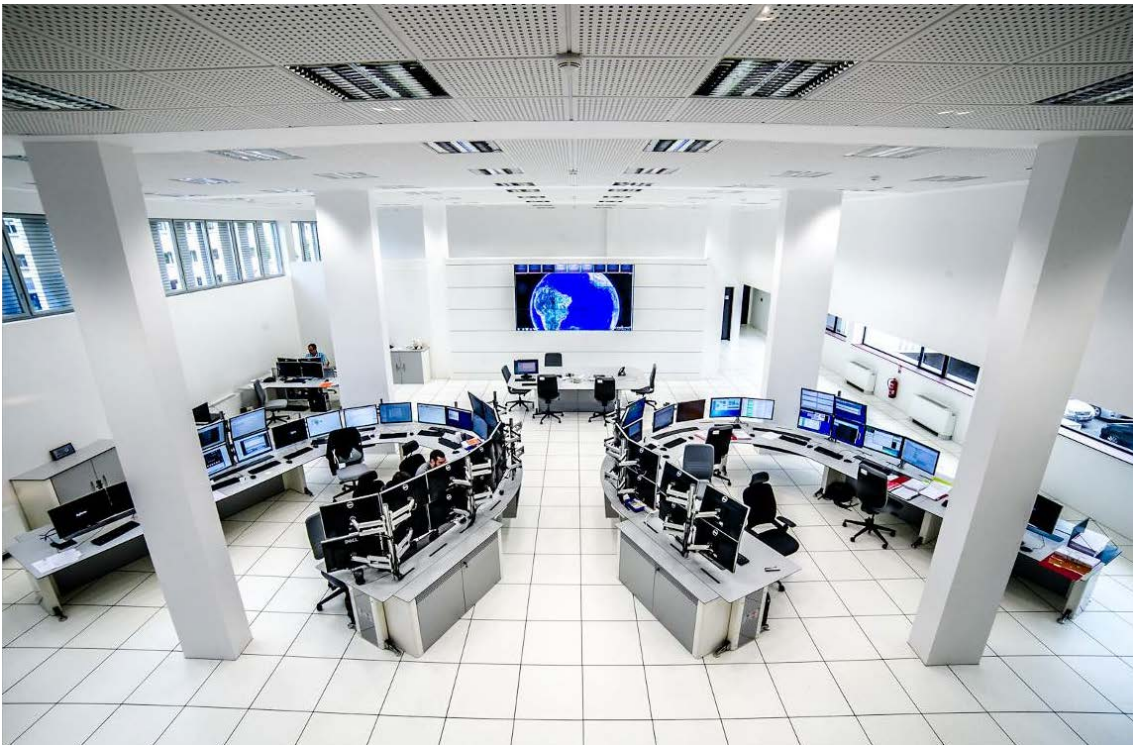


Figure 20 : Global and Regional Processing Centers



**Figure 21 : CLS Toulouse new building**



**Figure 22 : CLS Toulouse Control Room**



**Figure 23 : CLS Global Processing Data Center**

### **3.3.1. Argos global processing centres architecture**

In 2014, most of the improvements regarding the Argos processing centers have concerned the US center, in order to ensure the same level of service as FR center:

- HA (High Availability) infrastructure was setup at CLSA (2 ESX with 2 HA LeftHand Storage and Qnap Storage for backup)
- Firewall and switch were upgraded
- F5 BigIP solution was setup for network traffic management and security.
- All Argos servers were virtualized to this architecture with new operating systems.
- Backup architecture/software were implemented (Veam for virtual servers and TSM for physical servers)
- New supervision solution was installed (Nagios EON – same as FR center)

Each global processing center is autonomous and can work alone. In normal mode, both processing centers receive, process and distribute Argos data to:

- North-American users for CLS America
- users of the rest of the world for CLS France

In case of problem with one of the two centers, the other one stays alive and is capable of receiving, processing and distributing Argos data to ALL users. The switch to the remaining alive center is completely transparent for the users. It means that the users continue to receive or to access to their data, without changing anything on their side, as if nothing has happened.

The figure here below represents the architecture of CLS France and CLS America global processing centers.

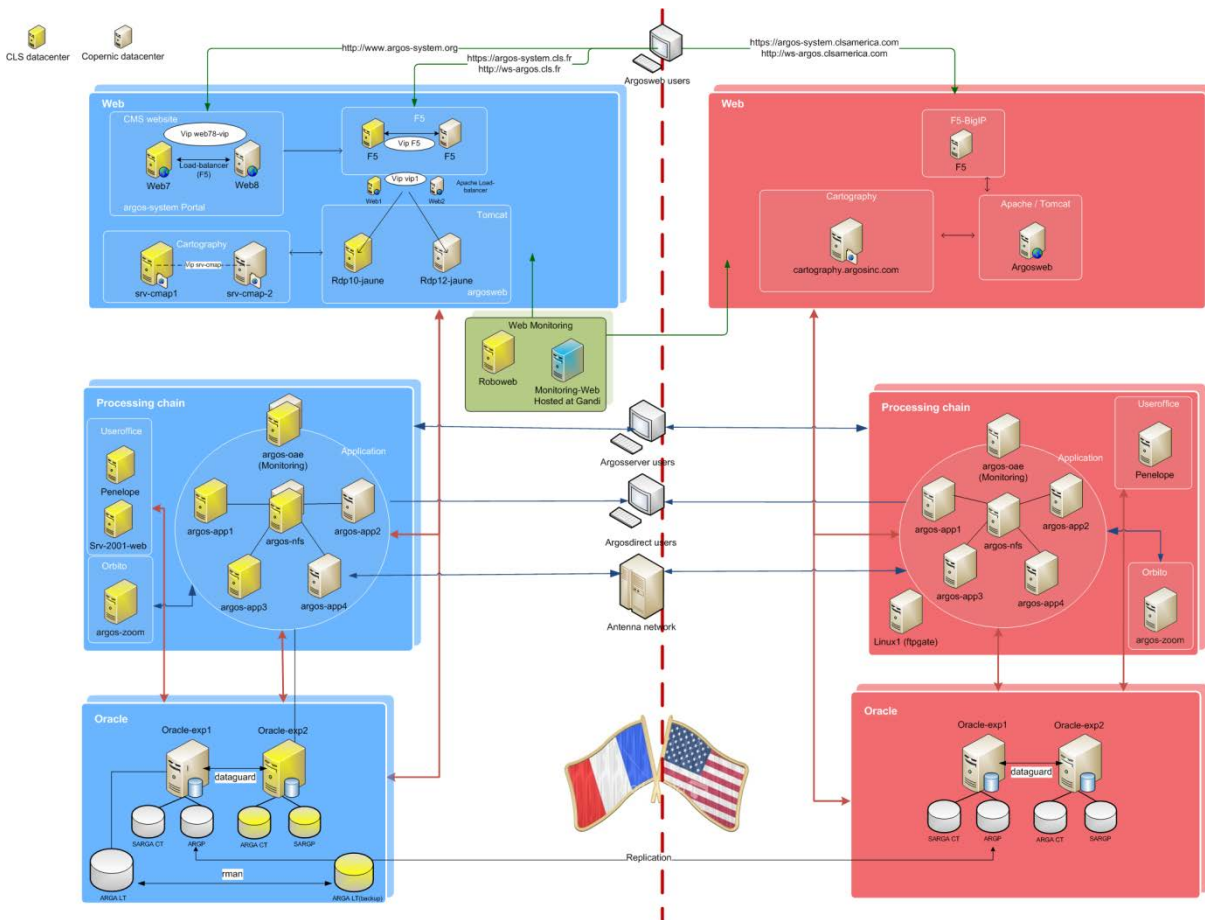


Figure 24 : CLS Toulouse and CLS America IT architecture

The architectures of CLS France and CLS America processing centers are quite similar and based on the same principle, with three main subsets:

- the processing chain
- the Oracle database service
- the Web distribution

### 3.3.2. The CLS Argos processing chain

Composed of different software modules, the processing chain is in charge of receiving and processing the Argos data issued from the satellites and acquired by the global and real-time ground stations networks.

Argos data are processed in terms of collect and positioning, and stored into a database.

The processing chain is also in charge of distributing the users data by ADS (Automatic Distribution System) or allowing users to access to their data using Telnet, ArgosWeb or the web services.



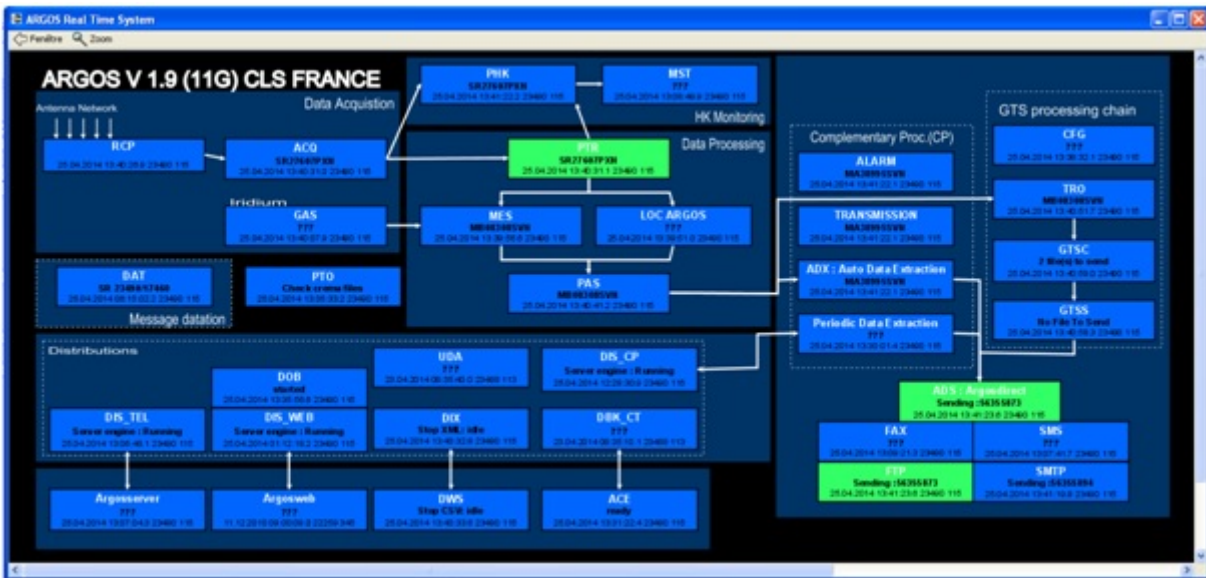


Figure 25: Synoptic of the CLS Argos processing chain

### 3.3.3. The Oracle database

At the heart of the computing architecture, the Oracle database is used to store the Argos declarative data as well as the processed data.

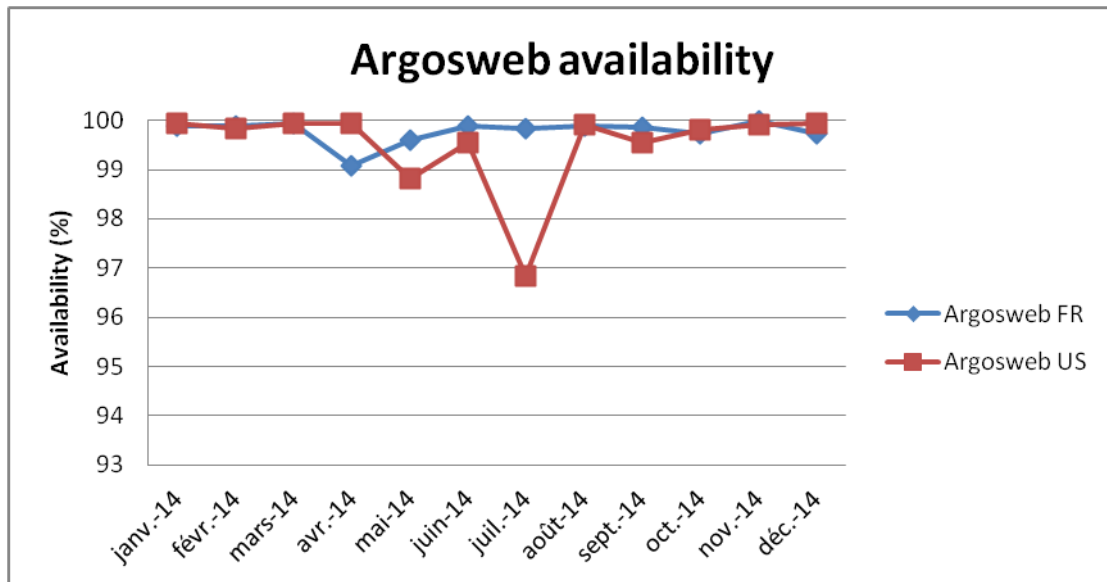
In order to keep a perfect coherency between CLS France and CLS America centers (mandatory to guarantee the redundancy between both centers), an automatic mechanism of replication is implemented between CLS France and CLS America databases.

### 3.3.4. ArgosWeb site

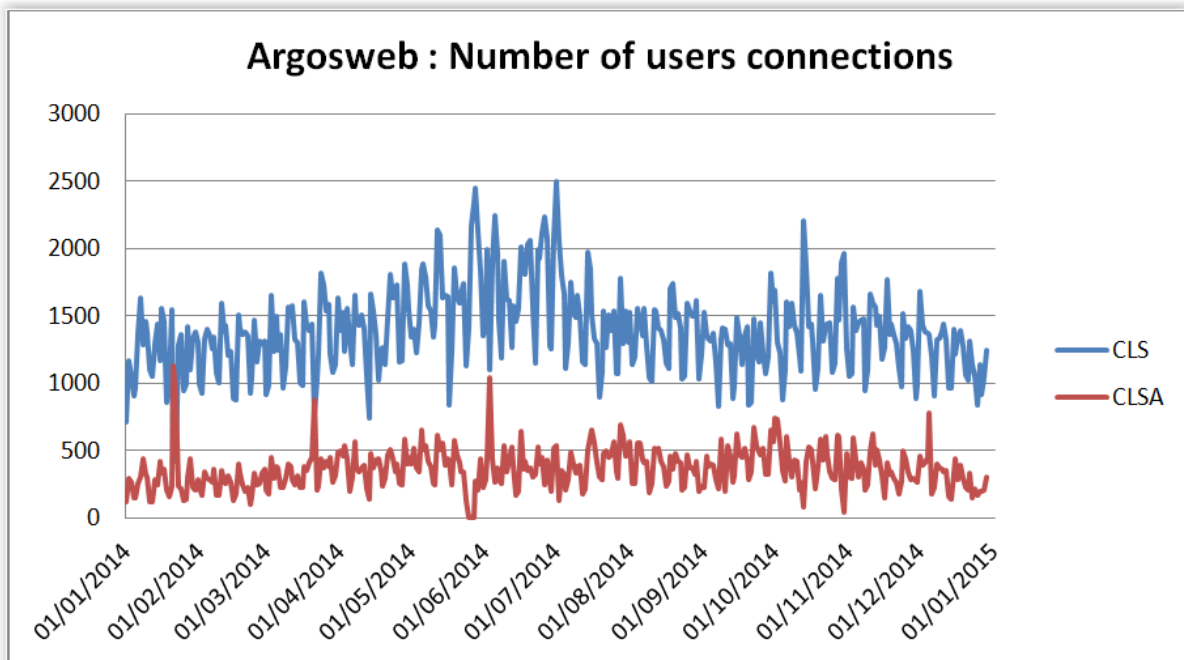
Based on a farm of Apache Web servers, the Web distribution allows the users to access their data using a Web cartographic interface. The service of maps is supported by two cartographic servers used by the mapping engines C-Map for the marine cartography and MapInfo for the terrestrial one. The application server is supported by Tomcat. ArgosWeb is a free web site for Argos users. They can access their data via the Internet, by logging on to a secure [website \(http://www.argos-system.org\)](http://www.argos-system.org) with their username and password (assigned to them by User Services).

ArgosWeb gives users secure and easy access to Argos data via an attractive and user-friendly website. With ArgosWeb, users can view platform trajectories on land and marine maps. Users can also personalize data download formats (table or map format). Users have immediate access to information on their Argos account, as well as platform and program settings.

The annual availability of the French ArgosWeb site (FR) in 2014 is 99.77%  
 The annual availability of the U.S. ArgosWeb site (US) in 2014 is 99.50%



**Figure 26 : ArgosWeb availability in 2014**



**Figure 27 : Number of daily ArgosWeb visits in 2014**

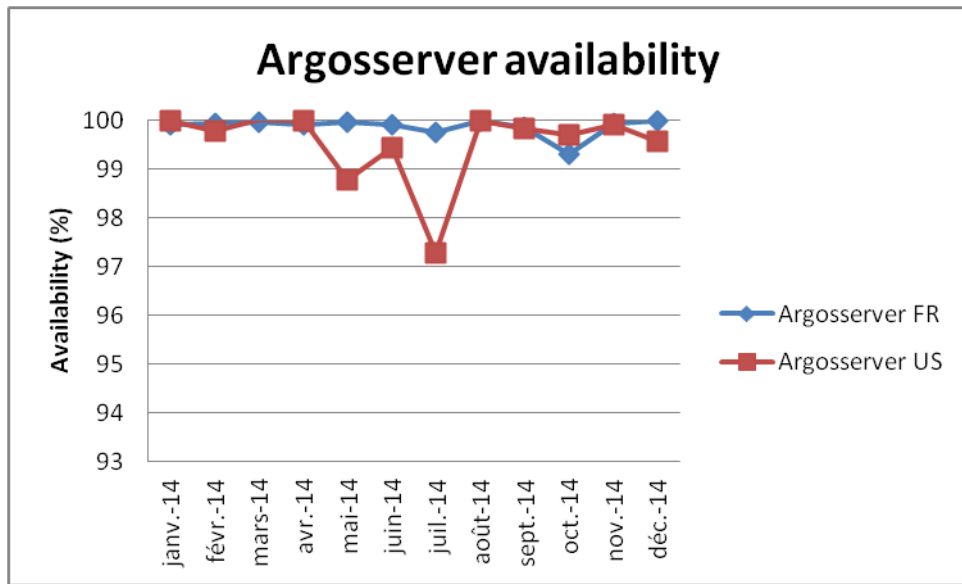
An entirely new version of ArgosWeb with a new cartography tool is being developed and due to be released at the end of 2015. This version will incorporate a responsive design, compatible with all browsers and smartphones & tablets, and will feature upgraded functionalities.

### 3.3.5. ArgosServer

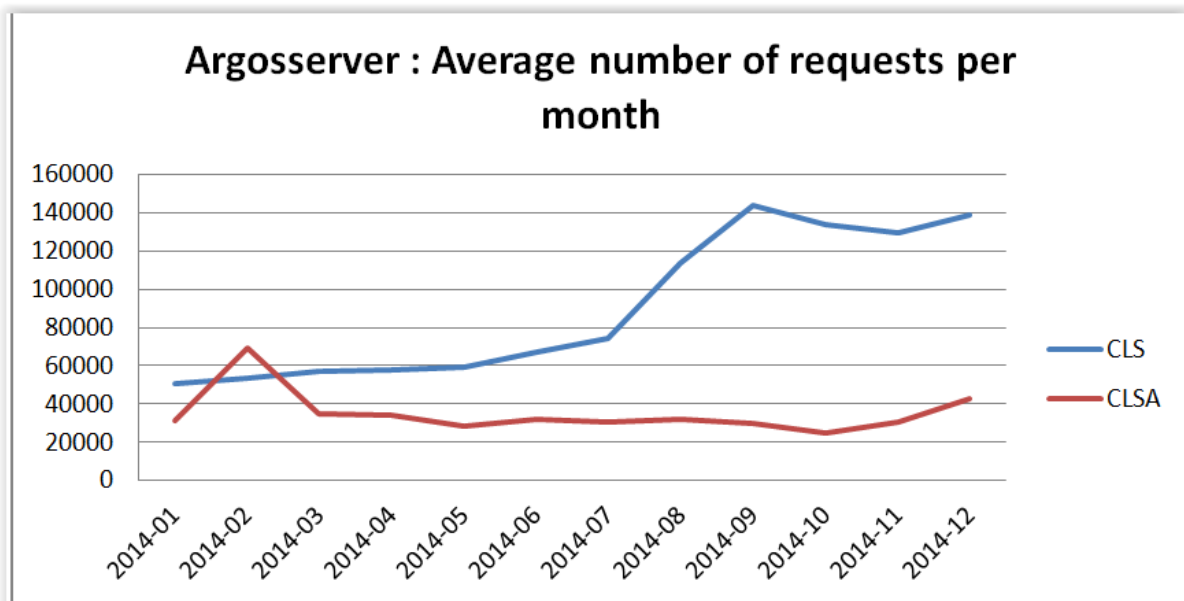
With ArgosServer, the Argos users can logon to Argos Processing Centers and access their data via TELNET. TELEcommunication NETwork is a network protocol used by all TCP/IP compatible networks. A Telnet session with CLS's servers can be opened by typing the "Telnet" command on most operating systems (Windows, Unix...). Addresses of the two ArgosServers are:

- o ArgosServer.cls.fr
- o ArgosServer.clsamerica.com

The annual availability of the French ArgosServer site (FR) in 2014 is 99.87%  
 The annual availability of the U.S. ArgosServer site (US) in 2014 is 99.52%



**Figure 28 : ArgosServer availability in 2014**

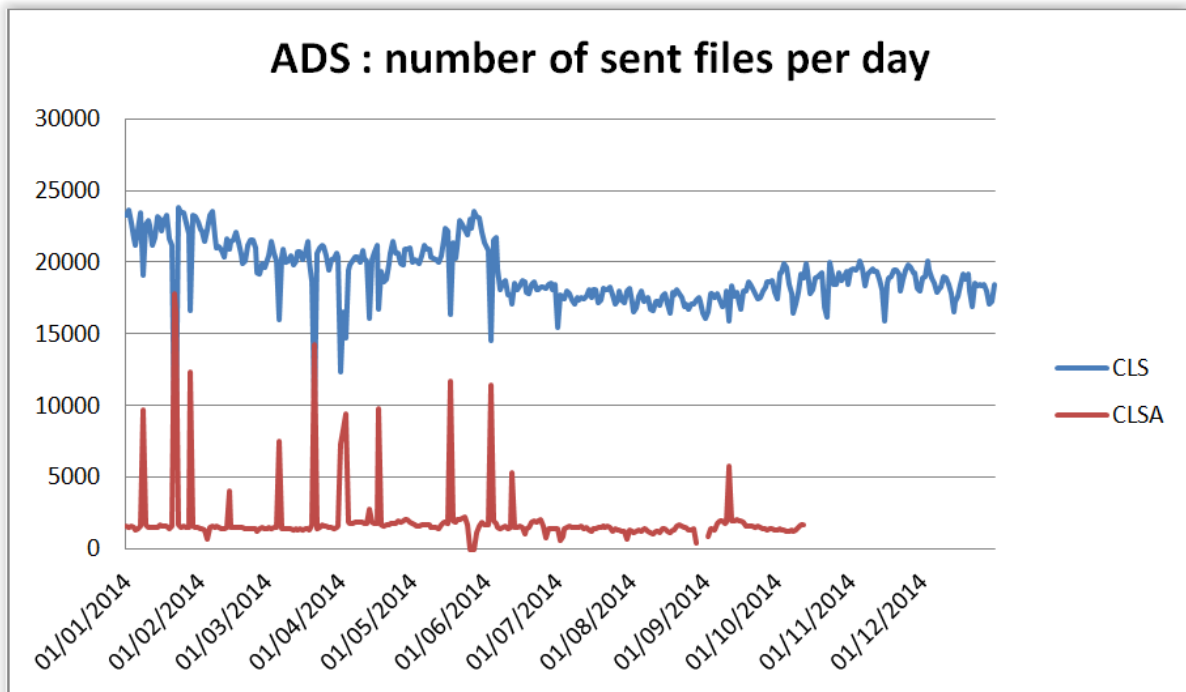


**Figure 29 : Number of ArgosServer requests in 2014**

### 3.3.6. ArgosDirect

ArgosDirect automatically sends data to users by e-mail, FTP or CD-ROM. ArgosDirect allows users to receive their data in several available formats (tabular, DS, DIAG...).

Backup periods (when one of the two Argos processing centers is down) are clearly identified on the graph below.

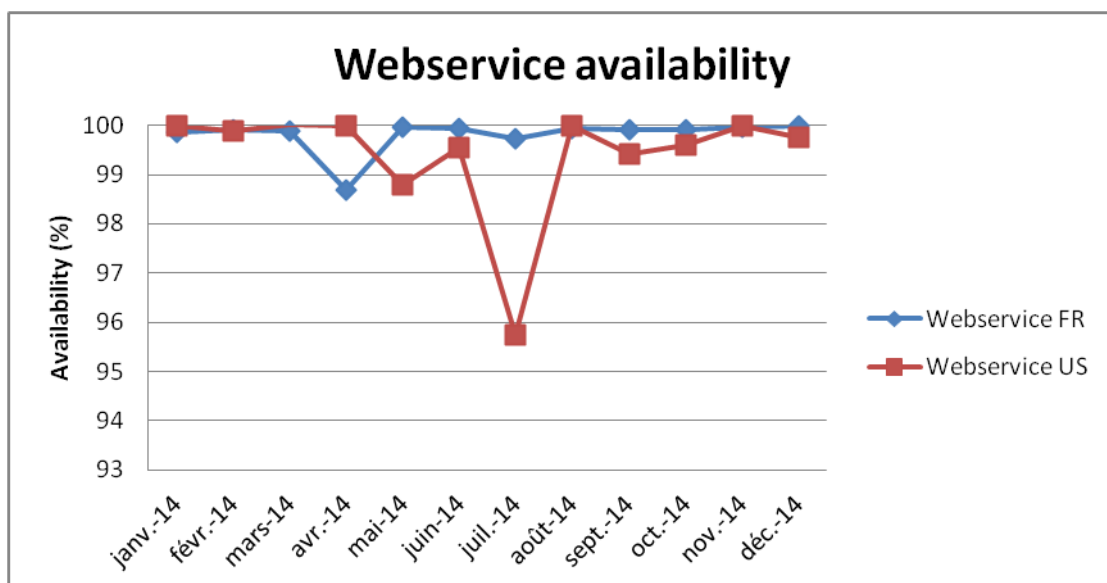


**Figure 30 : Daily number of files sent by ArgosDirect in 2014**

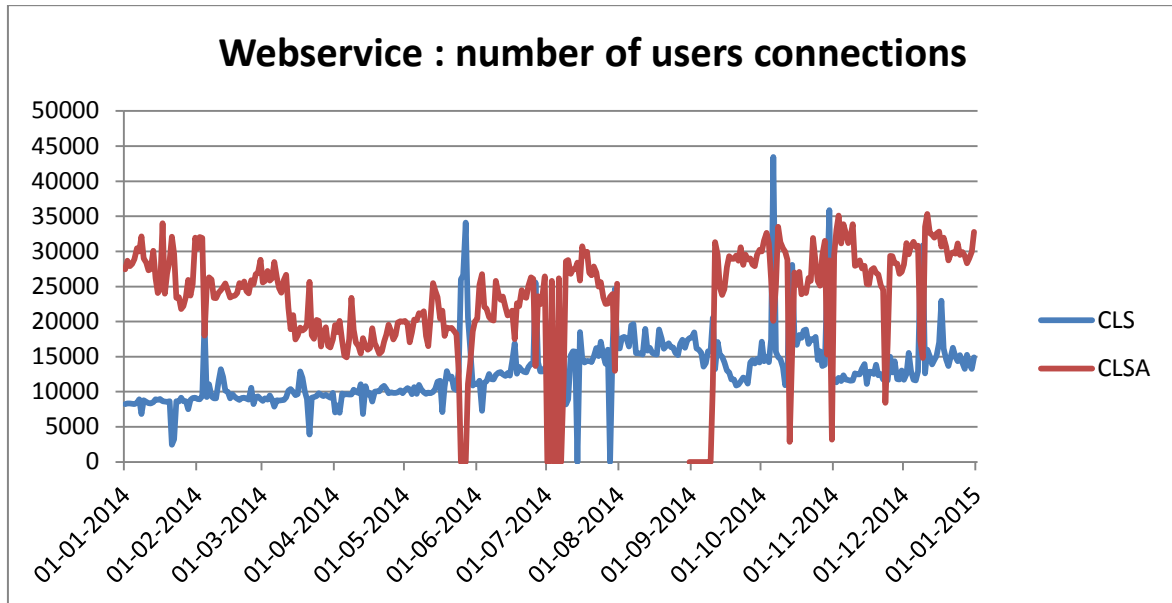
### 3.3.7. Argos WebService

Argos WebService is a machine-to-machine/automatic interface for Argos data distribution. This modern alternative to ArgosServer (Telnet) is free of charge and makes it possible for Argos users to contact CLS’s database directly, via internet, and receive their data in **CSV, XML and KML (Google Earth) format**. The Argos WebService delivers useful information such as positions, error estimates, diagnostic data, raw messages, sensor data, etc. The user can choose the different types of data to download via filters.

The annual availability of the French WebService (FR) in 2014 is 99.81%  
 The annual availability of the U.S. WebService (US) in 2014 is 99.39%



**Figure 31 : Argos WebService availability in 2014**



**Figure 32 : Number of Argos Webservice connections in 2014**

### 3.3.8. Disaster recovery architecture

Disaster recovery architecture implementation is completed since 2012. The computer room is located into CNES Toulouse. Some of the Argos architecture components are DR compliant in order to improve services availability. However, the main backup is based on the 2 global processing centers (Toulouse & Lanham).



**Figure 33 : Disaster Recovery Room located in CNES**

### 3.3.9. Data processing statistics

The Argos Operations missions at CLS are:

- Availability and reliability of Argos products and services in accordance with the SLAs, supporting internal or external Argos projects, or proposals,
- Controlling and reducing operational risks and costs in order to ensure 24/7 operational services.

In order to monitor the Argos processing centers, statistics are produced in real-time:

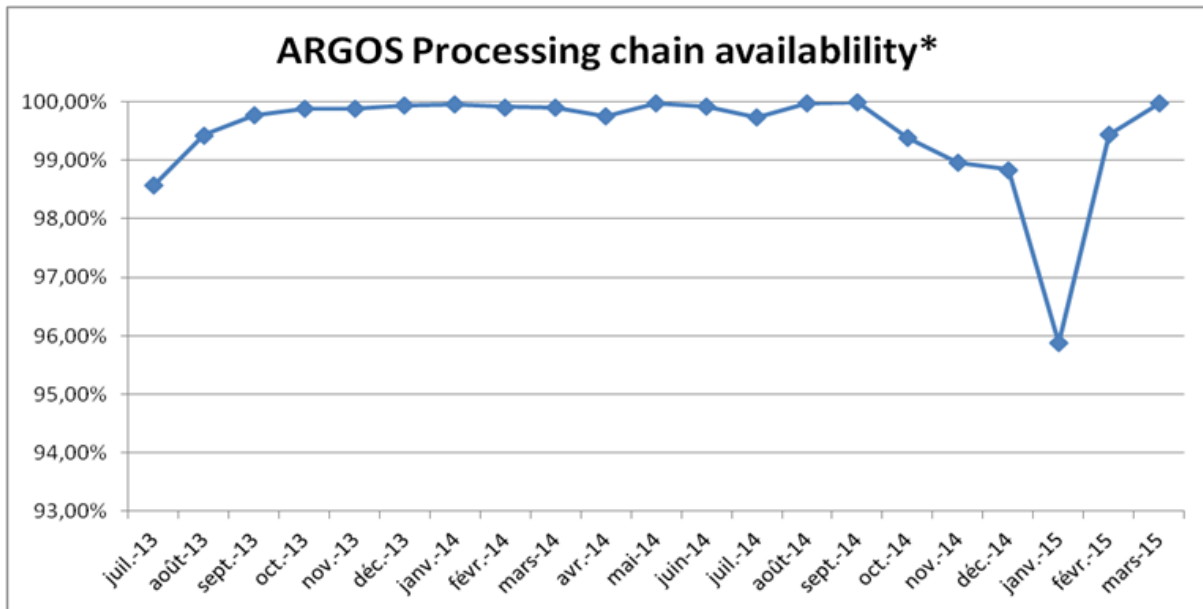
- on the availability of Argos data distribution tools,
- on the data delivery time for sample platforms,
- on Argos location delivery time for sample platforms,
- and on the percentage of data available in less than one hour.

**For 2014, the processing performance indicator is 99,69 %.**

This indicator corresponds to the percentage of real time datasets processed in less than 10 minutes (between pre-processing component PTR and PAS component in charge of inserting data in database for user requesting). This number does not include periods when the French site was in backup mode on the US site.

In this context, decreasing availability could be observed in case of pending datasets inside the processing chain. For example, when several global datasets are received at the same time, other datasets are queued and are waiting to be processed, which increases the time they spent between PTR and PAS modules. Priority to real-time datasets processing was added in July 2013 to avoid this queuing effect

The decreasing that we can observe from October to December 2014 is mainly due to an overloading of the Argos database. This problem has now been fixed.



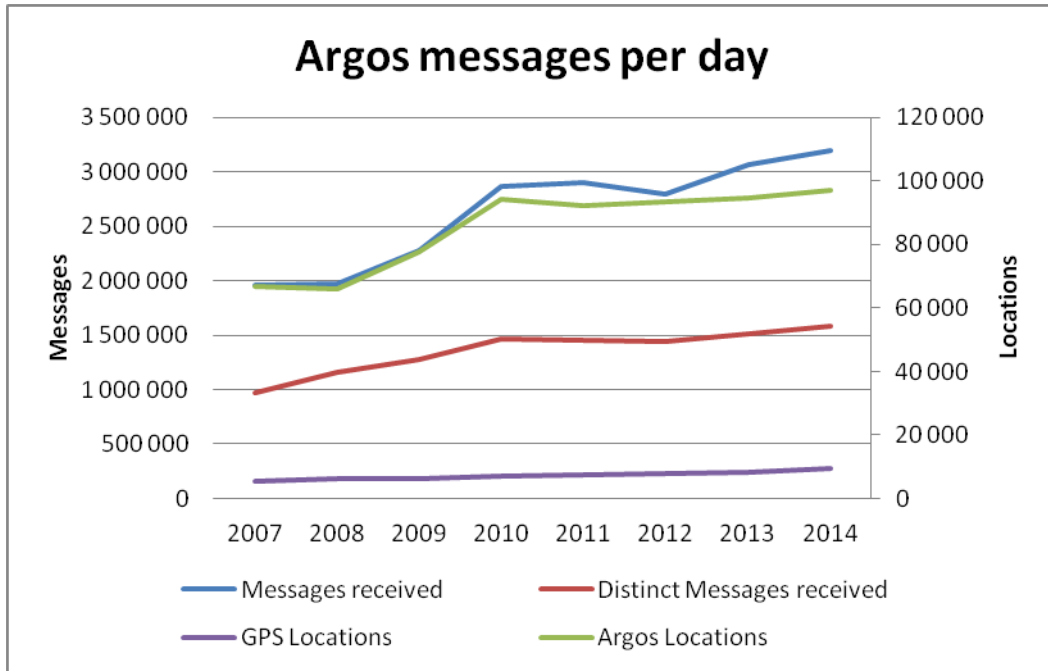
\*(percentage of Real-time datasets processed in less than 10 minutes)

**Figure 34 : Argos processing chain availability in 2014**

**3.3.10. Number of Argos messages and locations processed**

The average number of positions and messages computed daily by the Lanham and Toulouse Centers are:

**Figure 35 : Argos messages and locations per day (table view)**



**Figure 36 : Argos messages and locations per day (Chart view)**

**3.3.11. Argos location and data collection latencies**

Per day	2007	2008	2009	2010	2011	2012	2013	2014
<b>Messages received</b>	1 957 500	1 969 658	2 273 233	2 871 885	2 904 476	2 790 580	3 060 434	3 201 264
<b>Distinct Messages received</b>	972 000	1 164 717	1 272 459	1 470 953	1 451 938	1 443 247	1 513 630	1 580 910
<b>Argos Locations</b>	66 750	66 176	77 837	94 151	92 168	93 343	94 626	96 860
<b>GPS Locations</b>	163 150	187 829	185 496	205 259	212 587	224 857	243 366	273 034

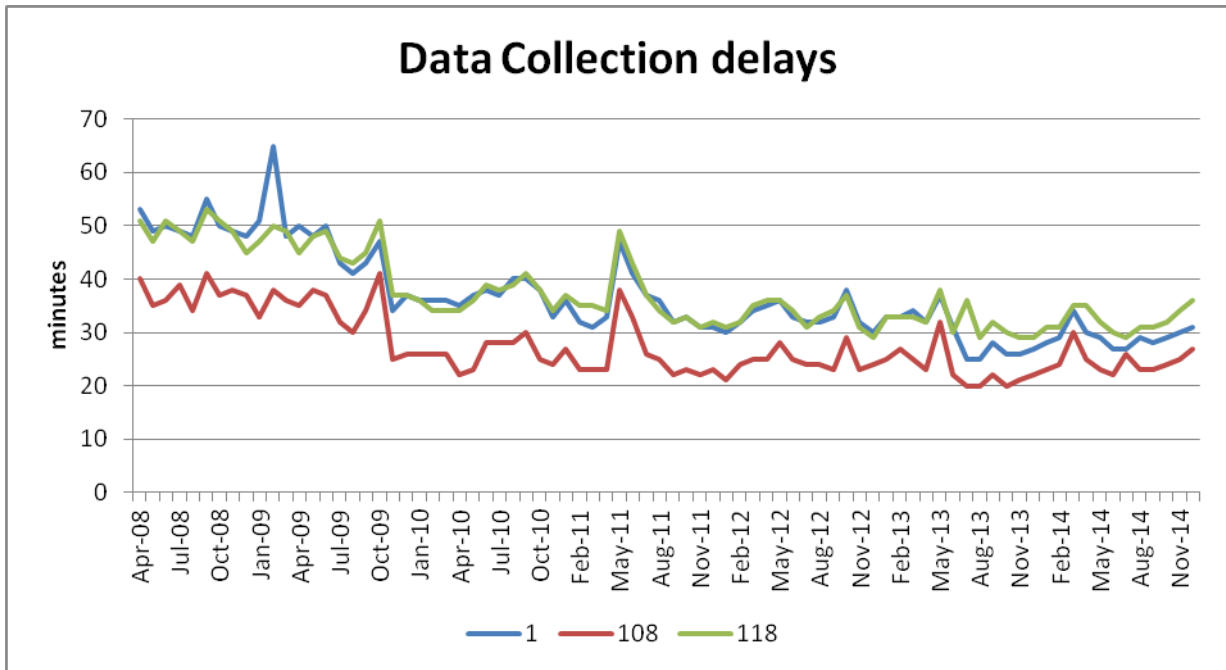


Figure 37 : Average latency on Argos data collection for sample platforms\* since 2008

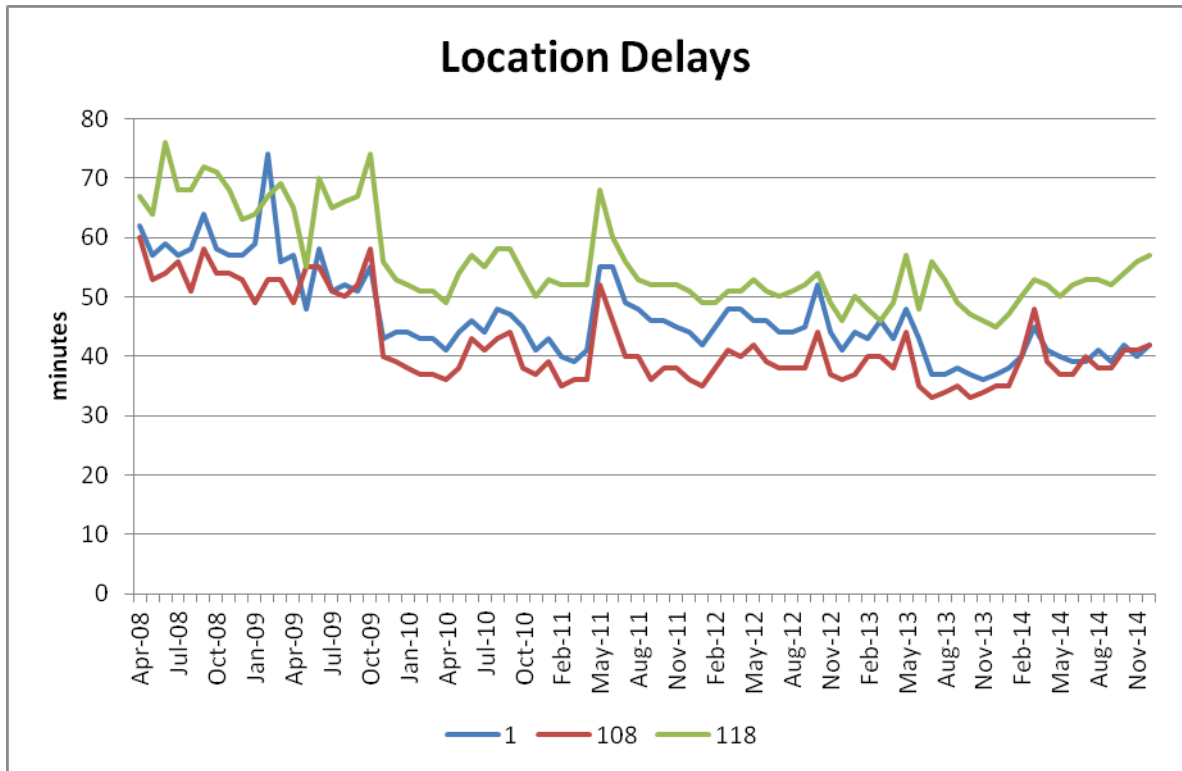


Figure 38 : Average latency on Argos locations for sample platforms\* since 2008

\* Sample platforms are timing and orbit determination platforms. Every hour, the last data collection and location times for these three platforms are controlled. Collection and location latency on ID 108 (Fairbanks) is under latency of Ids 1(Toulouse) and 118 (Wallops Island) due to the transmitter location and the higher number of passes over this transmitter.

We can see a major improvement on data and Argos location delivery time since 2008 due to a better real-time antennas network, new operational Argos satellites (NOAA-19, METOP-B and SARAL) and enhancements of the Argos data processing performance. Increase during May 2011 is due to processing issue (Database insertion driver issue). The average latency on Argos data collection in the Northern hemisphere is now under 30 minutes.



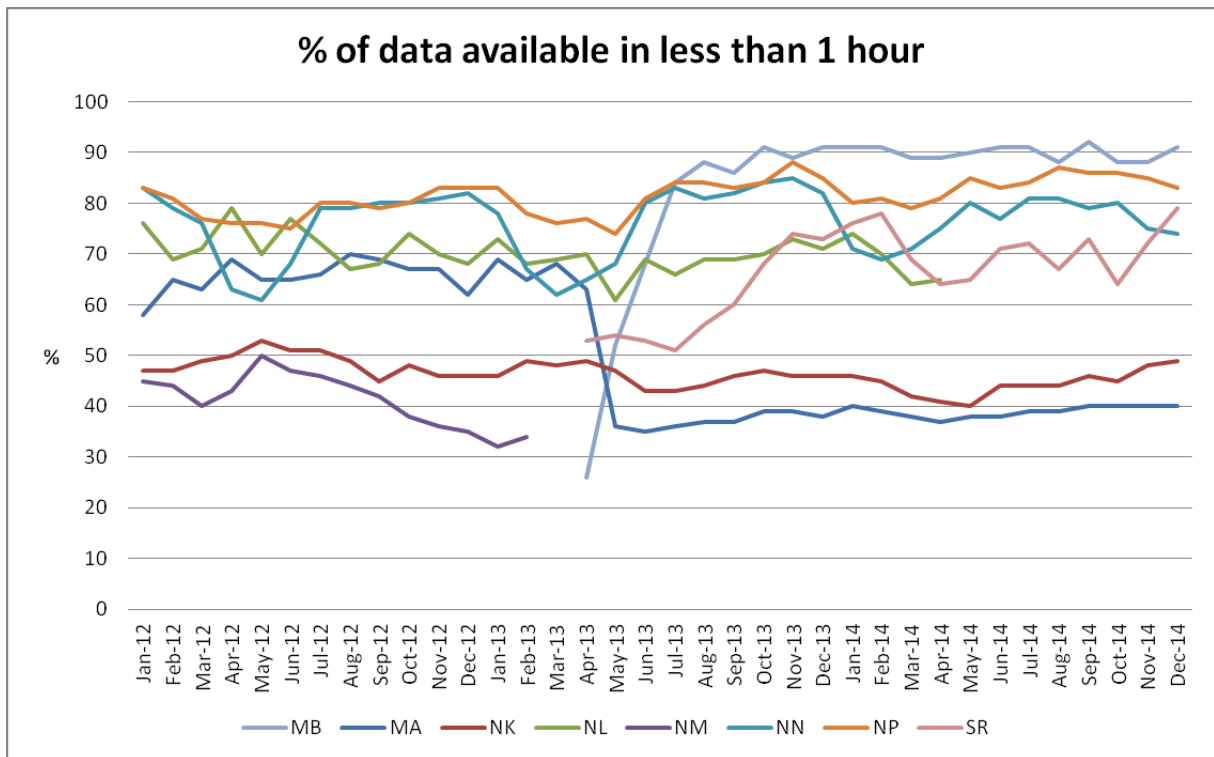


Figure 39 : Data available in 1 hour

The percentage of data available in less than one hour means the percentage of raw data that has been processed one hour after its recording on board of the Argos instrument. NOAA N, M and P operational satellites get a better coverage than NK and NL.

**3.3.12. Monthly active Argos platforms**

The number of Argos platforms operated has been relatively stable over 2014. There is still more activity in spring/summer due to the higher number of deployments at this period.

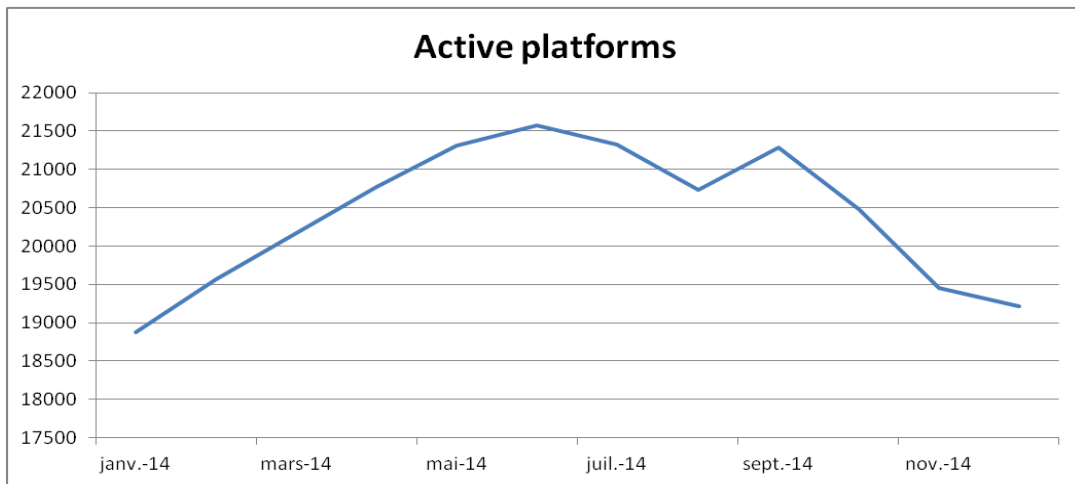
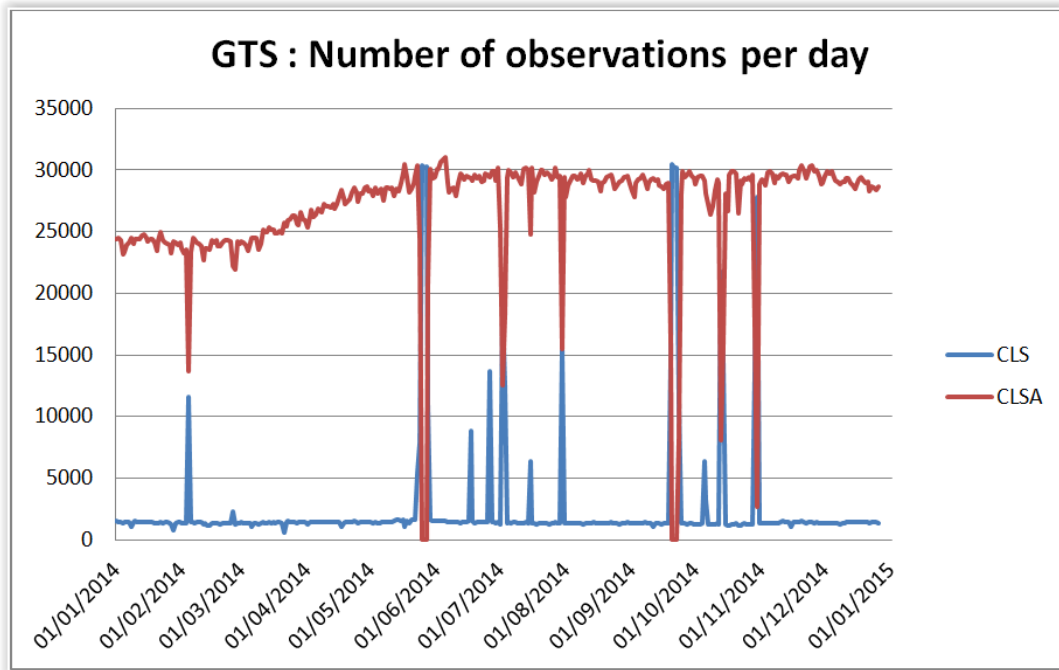


Figure 40: Monthly active Argos platforms in 2014

**3.3.13. GTS processing**

CLS is monitoring 24/7:

- the GTS processing system with real-time operational surveillance on the processing modules,
- the quality of the data,
- the system performance (time to process the data, number and size of bulletins)



**Figure 41: Number of GTS observation processed per day in 2014**

Backup periods (when one of the 2 Argos processing centers is down) are clearly identified on the graph above.

CLS has a GTS monitoring tool, delivering the following daily statistics:

- number of GTS platforms (with a WMO id) processed,
- number of observations processed,
- average disposition time (time elapsed between the observation and the insertion onto the GTS)

These 3 statistics are provided for each:

- type of BUFR bulletins
- type of buoy (ATLAS, DRIFTERS, ICE, TRITON and OTHERS)
- WMO area

### 3.4. System improvements

---

As in previous years, several software improvements were implemented in 2014 in order to fit with the user requirements. During this year, 107 anomaly forms were treated as well as 151 system change proposals. These application improvements have mainly concerned:

- **A new earth elevation model**  
For Kalman location only, a new earth elevation model (ACE3) has been in operation since June 2014. It provides more precise locations in some areas, and gives better altitude accuracy.
- **The improvement of our web services for Argos-3**  
The Argos Web Service provides new capabilities. In 2014/2015, it concerned access to adapted orbit parameters, and the possibility to send user messages to PMTs.
- **The BCH-based message correction**  
The processing center is now able to correct Argos message bit transmission errors, based on the BCH algorithm. CLS is now working with platform manufacturers and provides support to integrate BCH code in the transmitted messages.
  
- **ArgosWeb**  
Report capabilities for ROC (Representative Of Country) have been integrated in ArgosWeb: program activity reports, unused platform id reports, platform activity graphs and statistics.
- **A new Argos Orbitography**  
The integration of the new orbitography module (ZOOM) in Argos processing center has been completed. The Argos Doppler location processing, on the CLS and CLSA processing centers, benefits from the new orbitography products since March 2015.

The new Argos orbitography software includes 3 main improvements:

- o maneuvers are automatically accounted for which improves the continuity of the service
- o a better accuracy of the orbitography computation with a gain of approximately 50 meters (see figure below)
- o increased robustness and reliability with a software which is scalable and maintained

The figure below shows a comparison between the old and new orbitography software in terms of accuracy. The comparison was made on SARAL orbitography computation. The Doris orbit has been taken as a reference.

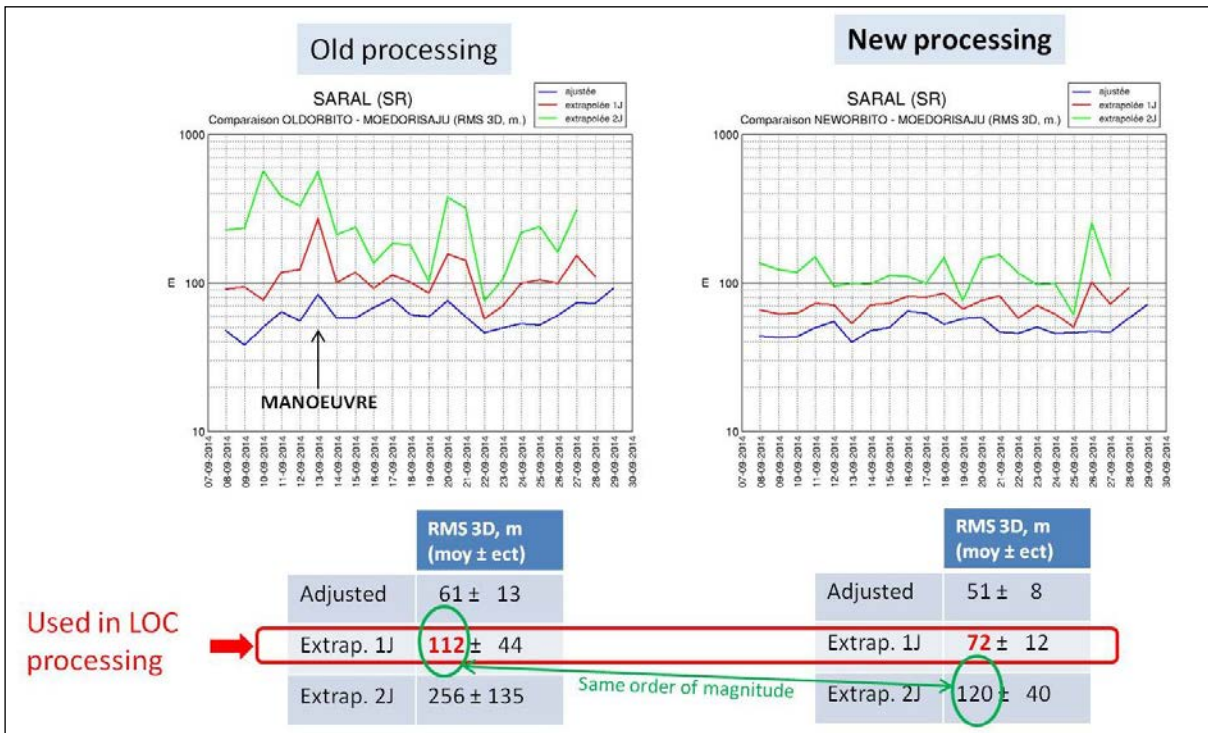


Figure 42 : Improvements of the orbitography accuracy

2015/2016 will see new improvements. Among the ones which are already planned, we can list:

- **The integration of a new BUFR sequence for drifting buoys**  
The BUFR table version 22 is now released. The 2 new BUFR sequences for drifting buoys (TM 315009) and moored buoys (TM 315008) will be operational end of 2015.
- **System monitoring services**  
CLS is developing two new services in order to improve the quality of Argos products:
  - o The reference beacon monitoring service will control the Argos collection system in several world areas. Reference beacons will transmit Argos data periodically, on all system-supported modulations. The service will analyze the reception quality of the data and will report in real time system failures to operators. It will also produce statistics data for long term system monitoring.
  - o The location monitoring service will control the quality of the Argos Doppler location system. It will analyze the quality of location of fixed stations, and will report in real time location process failures to operators.

The most important upgrade concerns the **complete renewal of the ArgosWeb user interface** (new version to be released at the end of 2015):

- The interface has been redesigned to be compatible with Android tablets and iPads.
- It will be compatible with various web browsers: Internet Explorer (from IE9), Chrome, Firefox, Safari, and IE360 - the Chinese browser.

- All previously existing ArgosWeb features have been renewed.
- The new ArgosWeb will provide new cartography capabilities, such as the ability to display various maps (marine map, road map, satellite imagery map), and the ability to superimpose meteorology and oceanography layers.
- This new version will make it possible for users to reprocess Doppler locations. As for the online data extraction, the users will create a location reprocessing request in ArgosWeb. The service will reprocess the Doppler locations using Least-Squares or Kalman algorithms. When the reprocessing is complete, an email will be sent to the user with a data download link (kml and csv formats).

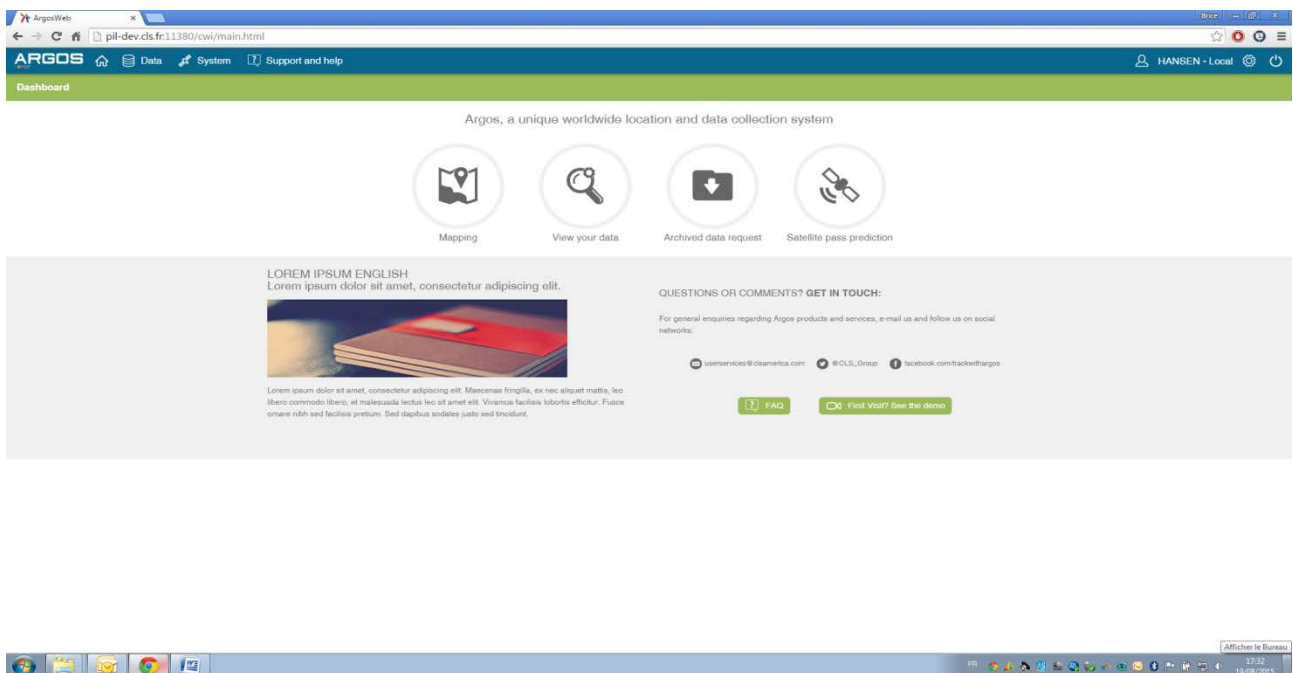


Figure 43 : Screenshot of the new ArgosWeb home page (test layout version, still being developed)

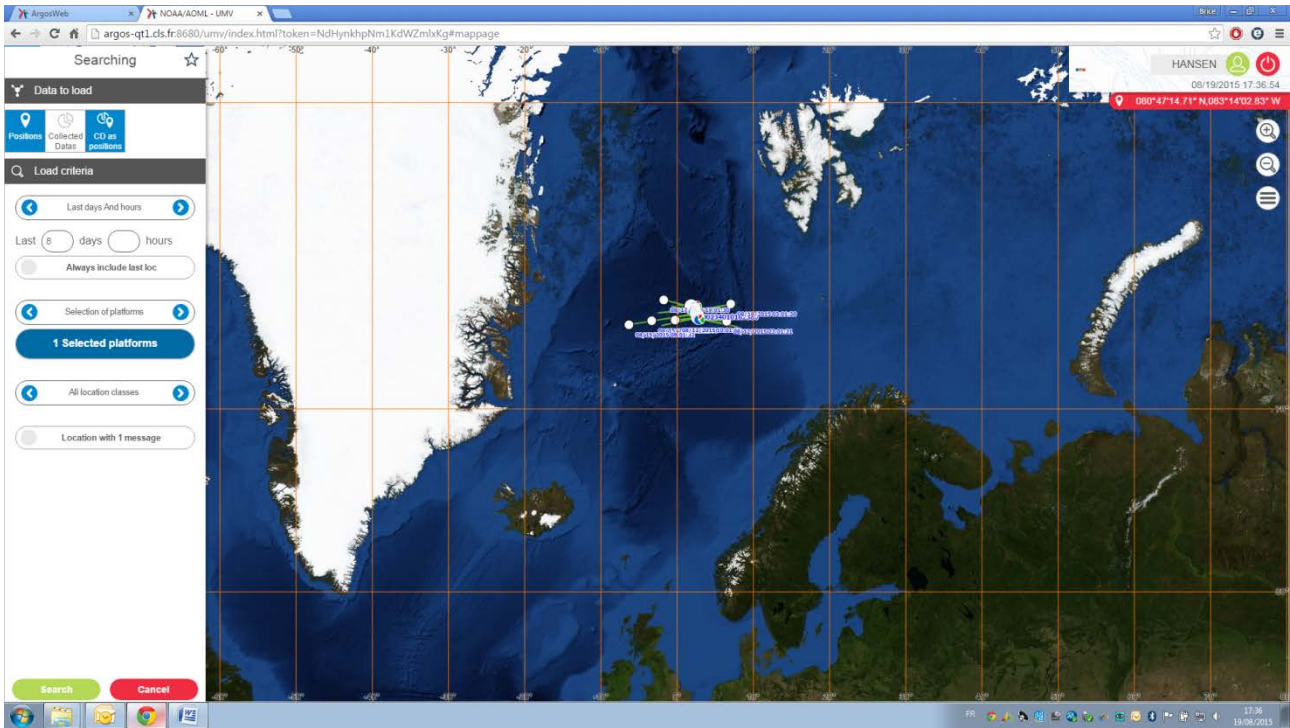


Figure 44 : Screenshot of the new web mapping tool (test layout version, still being developed)

### 3.5. Argos-4 ground segment upgrade

This project is aiming at identifying and implementing all the modifications of the existing Argos ground segment to take into account the new generation of Argos-4 instrument as well as a general enhancement of the Argos ground segment. This activity has been delegated to CLS by CNES.

Despite the fact that we do not know when the first Argos-4 payload will fly, the decision to start the Argos-4 ground segment upgrade was made, at least for the part dedicated to the general enhancement of the Argos ground segment. The project includes the following activities:

#### Developments:

- The major developments will concern the Argos Processing Center, which will be able to manage all the operational Argos instruments.
- New Master Beacons will be produced. They will have to be compatible with Argos-2, Argos-3 and Argos-4 instruments. They will replace the current Master Beacons.
- New Reference Beacons will be produced. They will be compatible with Argos-2, Argos-3 and Argos-4 instruments.

#### Qualification on a dedicated Argos Processing Center instance:

- The ground segment technical qualification will follow the development phase. It will include the qualification of technical specifications, the compatibility tests with Argos-2 and Argos-3 processing. In order not to disturb or impact the existing and operational Argos processing centers, all the qualification operations will be performed by using an Argos Processing Center specifically built for the Argos-4 project. This dedicated center will be available for CNES compatibility tests.
- Next step will be the ground segment operational qualification. The processing center performances will be checked; the operational documentation will be upgraded for Argos-4; the operational team will be

trained. The dedicated Argos-4 Processing Center will be available for CNES end-to-end tests.

- Final step will concern the system operational qualification, which will start after the satellite launch. The system performance will be validated; the operational procedures will be conducted; the operational instrument monitoring will start. During this phase, CNES will use the Argos-4 Processing Center for the instrument in-orbit commissioning.

**Operation:**

- Before the satellite launch, the new Master Beacons will be deployed, probably at Svalbard, Fairbanks, and Toulouse.
- After the instrument in-orbit commissioning and the system operational qualification, the production Argos Processing Center will be upgraded and configured.
- Argos-4 (and of course Argos-2 and Argos-3) routine processing will start
- After the CNES to CLS handover, CLS will operate the instrument and distribute the Argos-4 products.

**Status of the project:**

The Argos Processing Center development is composed of two phases:

The first phase consists in making durable the existing Argos Processing Center, to ensure operation for the next decade at least, and to prepare the development and integration of Argos-4 specific functionalities. The main functionalities to be developed during this first phase are the following:

Functionalities	Status
<b>New user services</b>	
Argos Web Interface	In progress
Smartphone application	Done
Data extraction on-demand	Done
Data reprocessing (location)	To be done
Web services	Done
<b>Location</b>	
Digital Elevation Model	Done
Smoothing	In progress
Initialization	In progress
Automatic maneuvers	Done
<b>Processing</b>	
GTS software	In progress
User Guidance Office	To be done
Archiving	Done
Downlink Messaging Management Center	To be done
Orbitography	Done
<b>Facilities</b>	
Master beacons	To be done
Reference beacons	To be done
Ground stations	In progress
Processing centers	In progress

The second phase is the integration of Argos4 data and the development of Argos-4 specific functions. This phase has been paused since 2014, waiting for better visibility of Argos-4 system schedule. However, the new cooperation CNES/ISRO has changed the deal. With the expected launch of Argos-4 on Indian satellite OceanSat-3 in 2018, this second phase will start by the end of 2015.

In parallel, CNES and CLS have started the development of new Master Beacons and Reference Beacons. These beacons are multi-mission, and the Argos-3 system will benefit from the new master beacons as soon as they are deployed on-site, waiting for the Argos-4 instrument launch.



4. Argos Users applications

4.1. Monitoring Argos platforms

The number of active Ocean/Met Argos platforms has increased by nearly 5% in 2015. This is due primarily to the larger number of active drifting buoys using Argos in the Global Drifter Program.

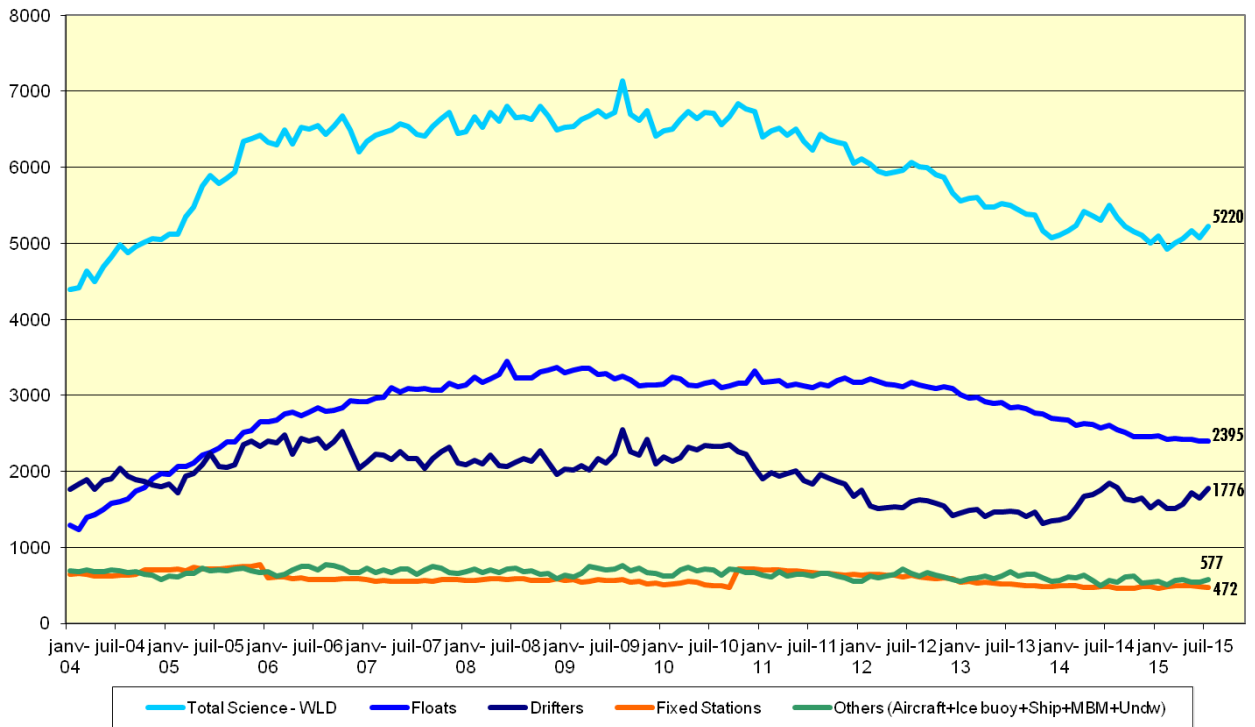


Figure 45: Monthly active ocean Argos platforms statistics

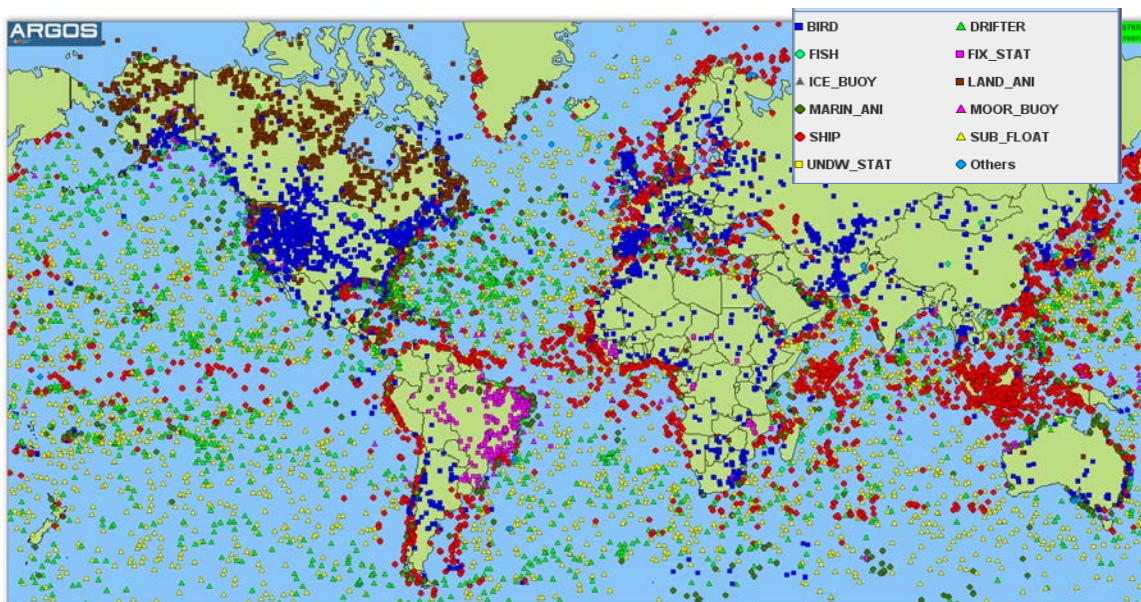


Figure 46 : Active Argos platforms repartition (June 2015)

4.2. CLS Argos report for JCOMMOPS

CLS continues to submit quarterly reports to JCOMMOPS which include the following information:

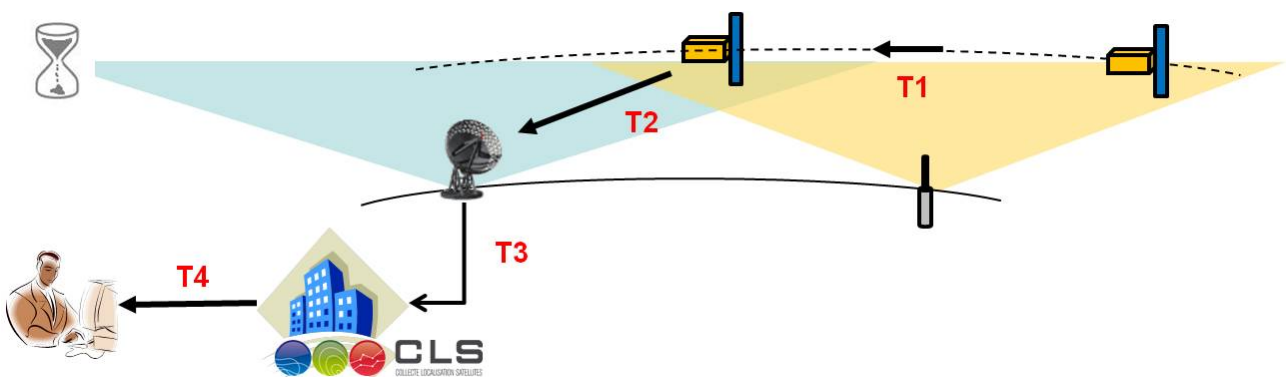
- All new ocean and meteorological Argos programs created
- All new ocean and meteorological Argos ID numbers created
- Active Argos platforms without WMO ID number assigned
- All Iridium ocean/met platforms processed by CLS

### 4.3. Argos data timeliness

The Argos Data disposal time is defined as the elapsed time between when an observation is collected by an Argos platform and when it is available to the user.

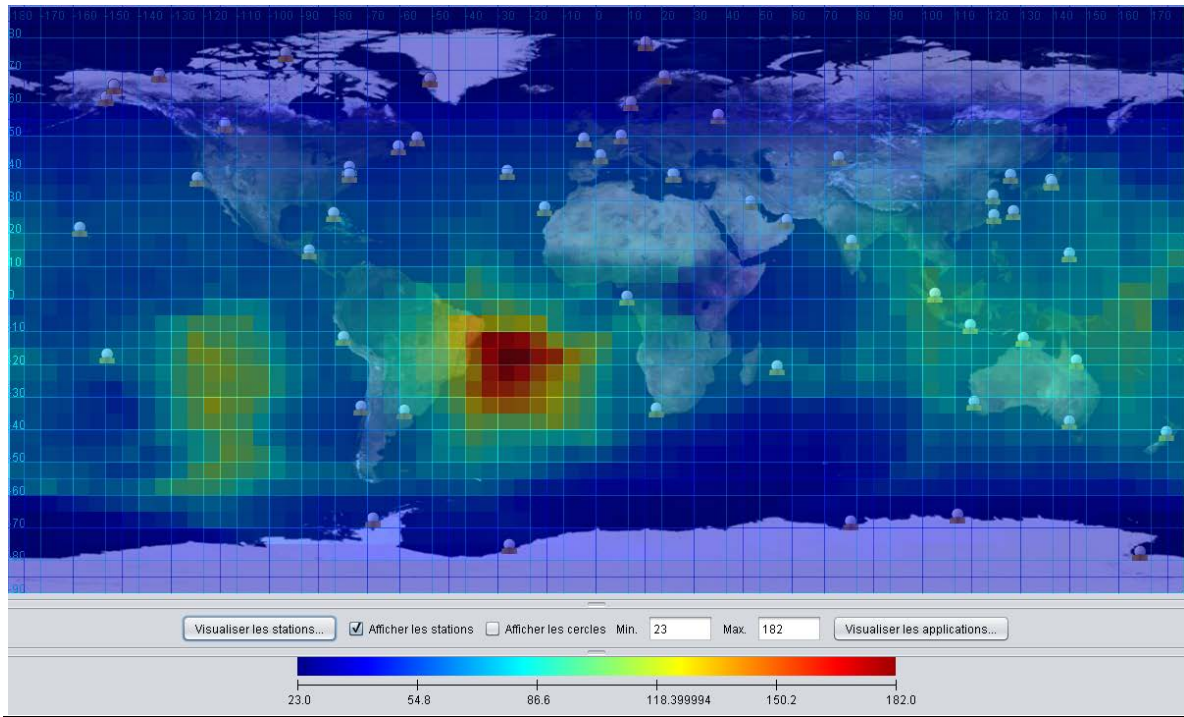
The Argos Data Mean Disposal Time is composed of four delays:

- T1 = the revisit time (time for a platform to be seen by one of the Argos satellites),
- T2 = the time for the data to be downloaded to a ground station (nearly instantaneous for an HRPT station or corresponding to the time for the satellite to reach a global station),
- T3 = the data retrieval time (average time for the data to be transmitted to the Argos Data Processing Centers),
- T4 = the processing time (time required for the data to be processed in the Argos Data Processing Center and to be available for the users).

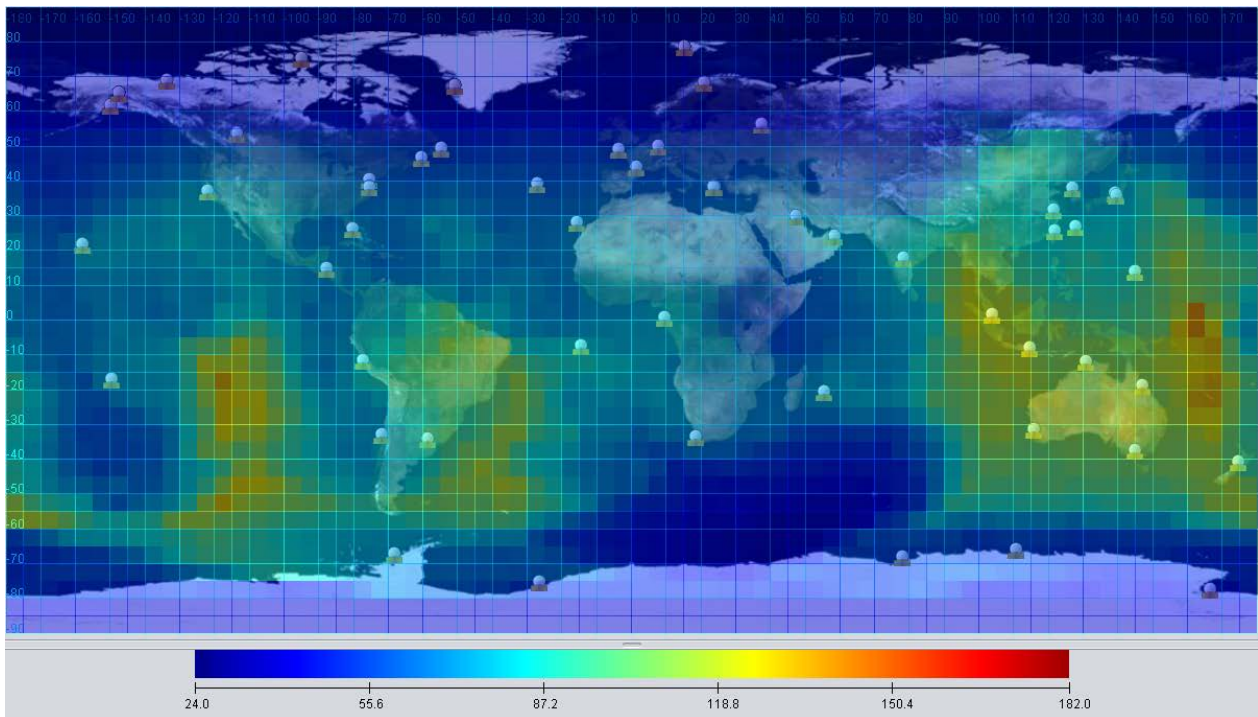


**Figure 47 : Argos data mean disposal time diagram**

The following figures represent the simulated Global Argos Data Mean Disposal Time. The simulation tool that generates these maps takes into account the Argos satellite constellation, the distribution of actual Argos platforms, and in the case of these maps, the actual performance of the Argos ground stations and data processing centers in May 2014 and May 2015:



**Figure 48 : Argos Data Mean Disposal Time in May 2014 (in minutes)**



**Figure 49 : Argos Data Mean Disposal Time in July 2015 (in minutes)**

The improved performance in terms of data mean disposal time is mainly due to:

- the newly upgraded station of Ascension Island receiving all Argos satellites, improving real time coverage in South Atlantic Ocean.
- More HRPT Stations receive MetOp and Saral Satellites data (Monterey, Hawaii, Lannion, Lima, Cape Town, Hatoyama, EARS Stations, La Réunion...).

We will continue to maintain and improve the coverage of the real-time antennas in the regions where it is needed. The primary two areas of focus are: South-East Pacific/North-East South America and Indonesia and South-West Pacific.

**For the Southeast Pacific/North-East South America area:**

2 new stations are planned before the end of 2015 to improve real-time coverage in these areas (Easter Island in cooperation with Meteo Chile and Cayenne, French Guyana)

**For the Indonesian and South-West Pacific area:**

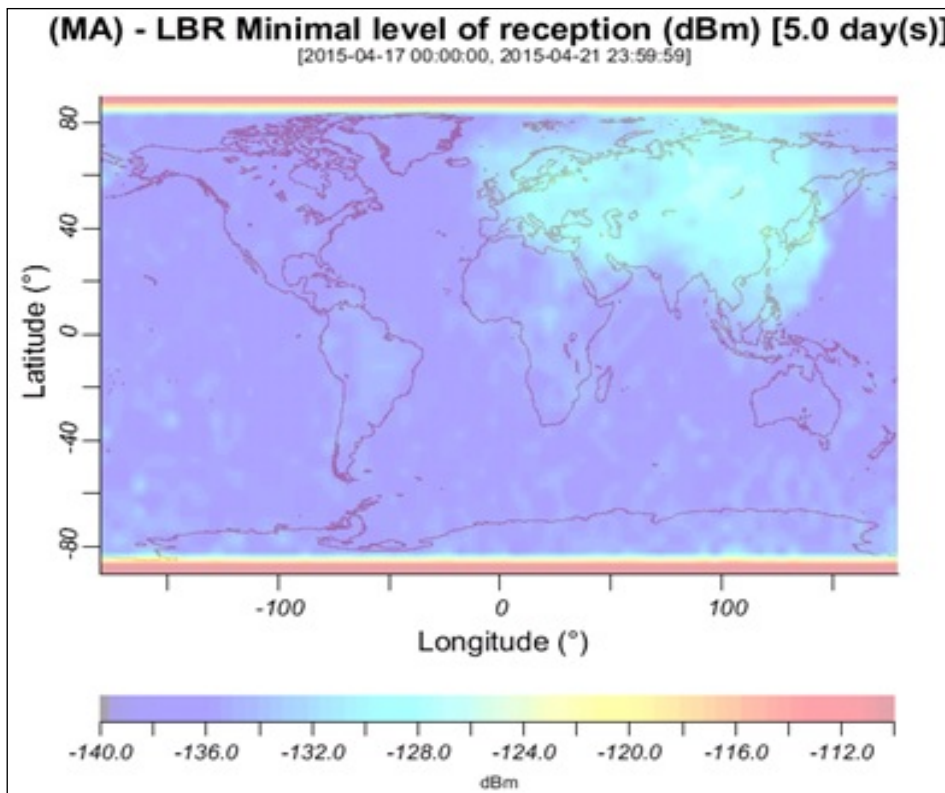
Key points are: maintaining the Indonesian coverage operational (Bali station currently in and out of maintenance) and ensuring the upgrade plan for South-West Pacific area (to be discussed with BOM).

**4.4. Background noise measured in the Argos frequency band**

---

The minimal received power measured by the in-flight Argos payloads allows us to determine the geographical areas where background noise is present in the Argos frequency band.

The figure below shows that the spatial extent of the interference in 2015 is significantly less that it was in 2007, particularly in the western Europe, northern Africa and eastern Asia regions. Additionally, the measurements indicate that the amplitude of the noise in those regions where it was originally the strongest has been reduced by as much as 4 - 10 dBm, depending on the specific region. Consequently, Argos users are finding improved conditions in these regions for receiving more data from the low power Argos transmissions.

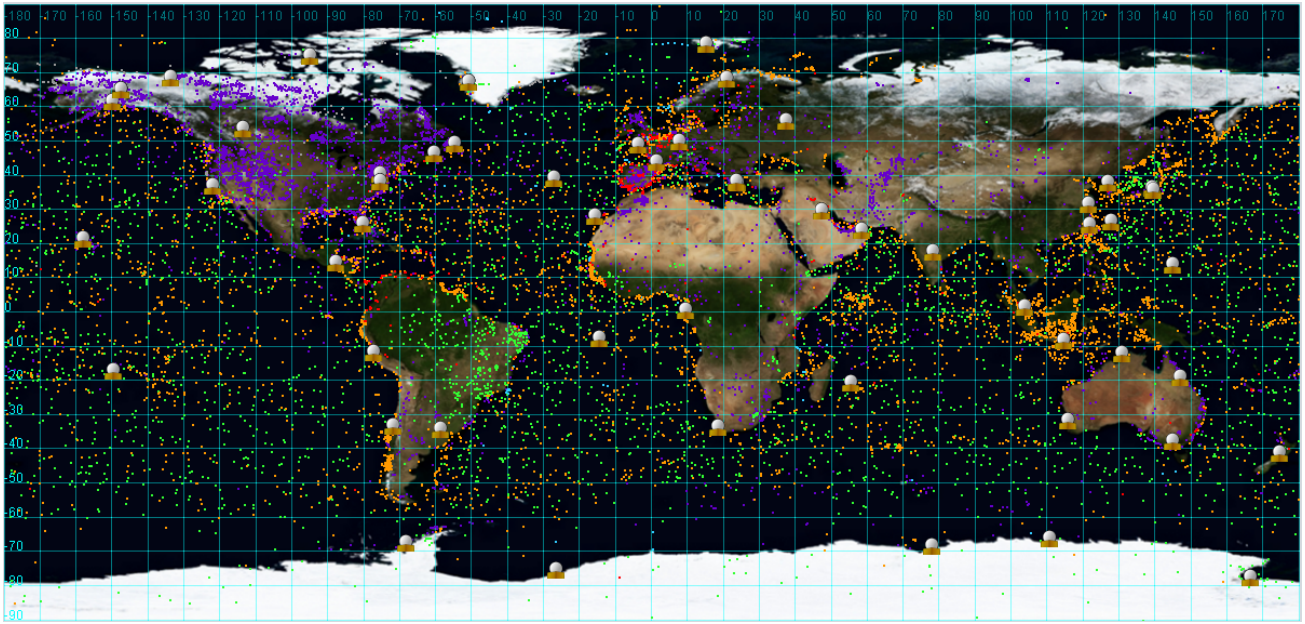


**Figure 50 : Minimal level of reception in the Argos frequency band in April 2015**

**4.5. Argos Platforms and related System Occupancy**

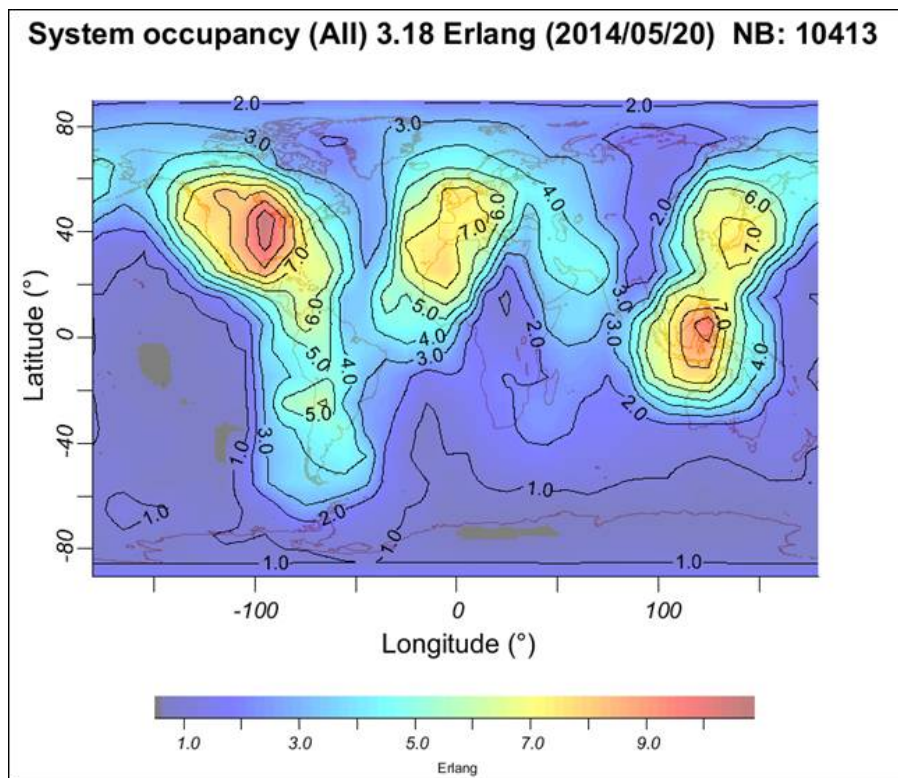
---

There are approximately 22,000 global active Argos platforms transmitting every day.

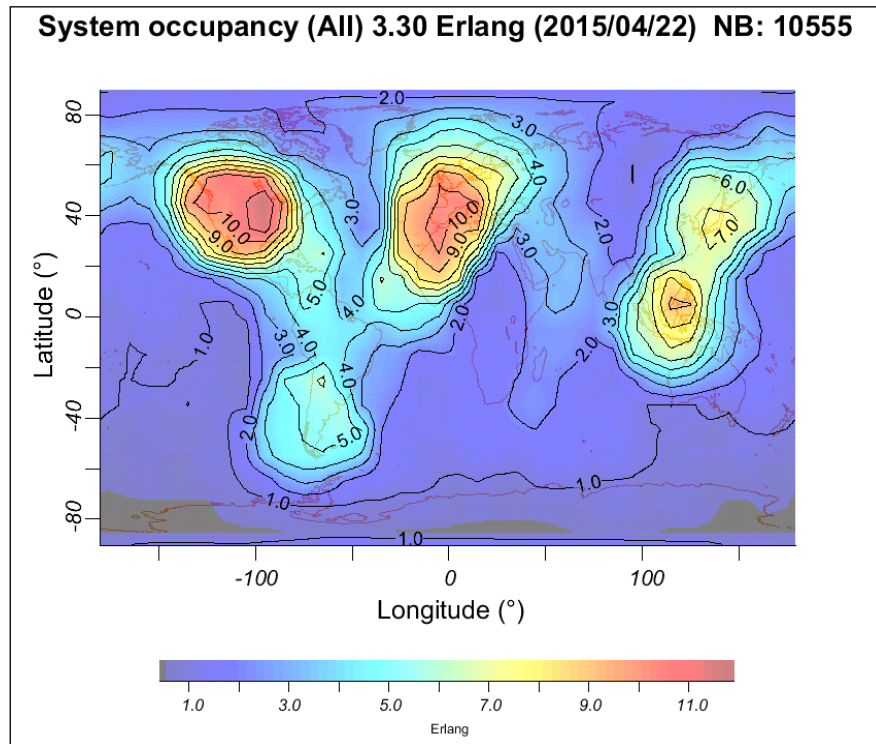


**Figure 51 : Map of Argos platforms deployment**

The system occupancy, which is measured in Erlang, (1 Erlang is equivalent to a PTT transmitting continuously) is represented as follows:



**Figure 52 : System Occupancy on 20/05/2014**



**Figure 53: System Occupancy on 22/04/2015**

Three constant peaks can be observed:

- Indonesia/Japan (6 to 9 Erlang)
- North America (6 to 12)
- Europe (6 to 10 Erlang)

For the 2014-2015 period, the above figure illustrates a systematic increase in occupancy primarily over the USA and Europe, which is due primarily to the manufacturers' transmission tests.

#### **4.6. Argos-3/Argos-4 chipset**

During the multi-year Argos-3 implementation project, we discovered how important both low power consumption PMTs, as well as an Argos-3/Argos-4 receiver are for the Argos buoy community

Consequently, CLS has implemented a project to develop a miniaturized, low power consumption Argos transceiver called SHARC. SHARC (**S**atellite **H**igh-performance **A**rgos-3/-4 **R**eceive/transmit **C**ommunication) is an ESA project managed by ANSEM, a Belgian company specializing in chipset design and manufacture, in partnership with:

- CLS
- Star-Oddi: an Icelandic company specializing in sensors and miniaturized data storage solutions for oceanographic and marine wildlife research
- A Wildlife tracking organization: APECS (specialized in shark tracking), WWF/Mediterranean (tuna)

The objective of this "Argos chipset" project is to design, manufacture and test a prototype of a miniaturized, low-cost, low power consumption Argos-3/-4 satellite chipset (ASIC) with two way communications capabilities (Argos-3, Argos-4), and to demonstrate its applicability by integrating it into a low-cost pop-up tag as part of the SHARC project.

Despite some delays, the project is progressing well:

- the Chipset has been fully designed and the first factory run of several units has been successfully accomplished

- Successful tests have been conducted at the ANSEM facility
- The popup tag that will support the field application has been fully designed by StarOddi

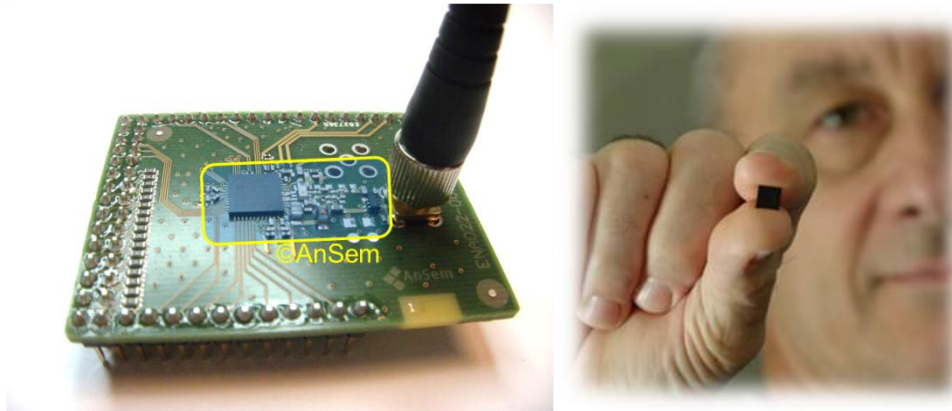


Figure 54 : Argos-3/4 chipset pictures

#### Remaining Work:

- Finalize the software implementation of the Tx/Rx A3 and A4 functionalities
- Second run of chipset manufacture to be carried out
- Full set of tests and certifications

The project has been delayed by several months due to some technical difficulties encountered by ANSEM and Star-Oddi. We have strengthened our collaboration and support with them to ensure the success of the project in the shortest possible time.. Prototypes are expected to be available for evaluation by manufacturers in the Fall of 2015.

#### 4.7. The RXG-134 Argos Goniometer

---



At the request of the Argos users who want to be able to retrieve their Argos transmitters (animal tracking, floats, drifting buoys, etc.) CLS contracted with the company Xerius, located in Toulouse to develop a new Argos direction finder.

After one year of study and development, the first prototype was delivered to CLS in March 2013. The tests and validation performed since April have been successful. SHOM, the French Navy, has already tested and approved the new Argos goniometer.

Depending to the goniometer antenna altitude, the Argos platform transmission power and the environmental conditions, the Argos signal can be received by the RXG-134 from few meters to more than 100 km.

Received Argos demodulated messages and Argos platform transmitter terminal (PTT) reception angle are displayed on the screen and available on the serial port.

The CLS goniometer is fully compatible with all Argos transmitter generations: from Argos-1 to Argos-3 including the PMT.

**Figure 55 : The new Argos goniometer**

Early 2014, an upgraded version of the RXG-134 was released, with two major improvements:

- The RXG-134 now features an internal compass with on-screen display of the cardinal directions
  - The system can now decode GPS positions in real-time, when the platform is fitted with a GPS. The absolute position is then displayed on screen.
-



**ANNEX IX**

**REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS**

*(Submitted by CLS)*

This annex contains, in consolidated form, the summary report from CLS/Service Argos, covering: Financial Report on the 2014 Global Agreement, including report and recommendations from the Argos Operations Committee (OPSCOM), and the financial status of the Agent and statement.

Table of Contents	
1. Report and recommendations from the Operation Committee.....	91
1.1. Report of the JTA Chairperson.....	91
1.2. Status of U.S. Programs.....	92
1.3. 34 <sup>th</sup> JTA meeting conclusions .....	93
2. Financial status of the Agent & Statement.....	94
2.1. 2014 JTA financial close of accounts.....	94
2.2. Details of JTA and non JTA basic Argos Incomes and Expenses (in million Euros).....	95
2.3. The Five Year Plan for 2010-2014 .....	96

**3. Report and recommendations from the Operation Committee**

**3.1. Report of the JTA Chairperson**

Eric Locklear opened his presentation with a discussion regarding the presentation contents, which were as follows:

- 1) Close-Out the 2010 FYP and adopt the 2015 FYP.
- 2) Continue to evolve the Argos JTA Spend Plan and the JTA Operating Principles.

Close-Out the 2010 FYP and adopt the 2015 FYP

=====

In Weihai, China, the FYP from 2010 - 2014 was discussed and the adoption of the 2015 - 2019 FYP was approved and subsequently transmitted to the OPSCOM in January, 2015. It was pointed out that while there is a lot of information that is presented in the FYPs, the important pieces of information for the OPSCOM can be summarized in the figures for the total revenue, total cost, the difference between these two, and the cumulated balance.

The cumulated balance is only to be viewed as an indicator of the overall JTA financial health. It is the responsibility of the Argos JTA to manage the process of analyzing the costs and revenue of the system and adjusting as necessary. Eric presented a FYP summary that charted 10 years of JTA costs and revenue and looking at the cumulated balance, a conclusion can be drawn that despite the expected loss to the JTA starting in 2017, the JTA will remain healthy because of the cumulated balance.

It was also noted that the FYPs have the following characteristics:

- 5) Costs Attributable to the JTA have decreased by approximately \$1.0M euro from 2010 - 2014.
- 6) The new FYP is projecting a 37% decrease in large program buoy usage, but only a 34% reduction in revenue by the end of 2019.
- 7) The new FYP is projecting an increase in Wildlife usage by 14% with a corresponding increase of 13% in revenue.

8) The new FYP separates the revenue by family (Wildlife, Buoys, Floats, & Fixed Stations)

The OPSCOM takes note of the healthy situation presented by the JTA Chair, and endorses the direction of the following new Five Year Plan (2015-2019).

	2015	2016	2017	2018	2019
	Projected	Projected	Projected	Projected	Projected
<b>JTA USAGE</b>					
<b>ACTIVE PTTs</b>					
Wildlife	7523	7749	7981	8221	8467
Fixed Stations	140	126	113	102	92
Buoys & Others	576	547	520	494	469
Floats	1050	1000	950	900	850
Large Program Buoys & Others	1300	1100	1000	900	800
Large Program Floats	1050	1000	950	900	850
<b>Total</b>	<b>11638</b>	<b>11521</b>	<b>11514</b>	<b>11516</b>	<b>11528</b>
<b>PTT-Year</b>					
Wildlife	1128	1162	1197	1233	1270
Fixed Stations	126	113	102	92	82
Buoys & Others	230	219	208	197	188
Floats	86	82	78	74	70
Large Program Buoys & Others	1068	904	822	740	658
Large Program Floats	86	82	78	74	70
<b>Total</b>	<b>2725</b>	<b>2563</b>	<b>2485</b>	<b>2410</b>	<b>2337</b>
<b>BASIC SERVICE INCOME</b>					
Wildlife	4,44	4,58	4,71	4,86	5,00
Fixed Stations	0,16	0,15	0,13	0,12	0,11
Buoys & Others	0,47	0,45	0,43	0,40	0,38
Floats	0,43	0,41	0,38	0,36	0,34
Large Program Buoys & Others	1,40	1,19	1,08	0,97	0,86
Large Program Floats	0,33	0,32	0,30	0,28	0,27
<b>Total</b>	<b>7,24</b>	<b>7,08</b>	<b>7,04</b>	<b>7,00</b>	<b>6,97</b>
Additional revenue (net revenue)	0,30	0,30	0,30	0,30	0,30
<b>Total revenue</b>	<b>7,54</b>	<b>7,38</b>	<b>7,34</b>	<b>7,30</b>	<b>7,27</b>
<b>JTA EXPENSES (M Euros)</b>	<b>7,23</b>	<b>7,34</b>	<b>7,45</b>	<b>7,56</b>	<b>7,68</b>

Continue to evolve the Argos JTA Spend Plan and the JTA Operating Principles

Eric continued the discussion with the two challenges facing the JTA, which is how do you know when to increase or decrease the tariffs? Recall that the Argos JTA is a "Cost Recovery" program and now that we have revenue data by family, the challenge for the JTA will be to determine the costs allocated to each JTA family. Then it would be simpler to demonstrate to the users that they are only paying for the costs allocated to their family. While this is theoretically possible, it will be difficult to put into the report because of the complexity of the Argos finances.

Eric concluded his presentation with a discussion regarding the operating principles. Since the JTA is stable, and there is participation from principally the largest user groups at the meetings, that maybe there could be a shift to bi-annual meetings in place of annual meetings in order to be more efficient and reduce costs. This issue will be discussed further by the JTA-EC, and JTA.

**3.2. Status of U.S. Programs**

Eric Locklear opened the discussion with a graphic that compared the FYP from 2005 - 2009 with 2010 - 2014. The U.S. large buoy program is a significant part of the Argos JTA usage and revenue. He went on to discuss the current composition of the U.S. program in total and reported that the combined U.S. programs are more than 1/2 of the total JTA revenue.

Eric went on to discuss the changing PTT consumption of the U.S. programs since 2010. During this time period, Buoys dropped from 74% to 63%, and Animals increased from 17% to 29%.

Eric concluded his presentation with a projected U.S. portfolio composition by the end of 2019. In summary, the Buoy program will continue to reduce its use of Argos with a change in composition as follows: 74% in 2010, to 63% in 2014, to 45% in 2019. Conversely, the Animal programs are expected to continue increasing their use of Argos with a projected change as follows: 17% in 2010, to 29% in 2014, to 47% in 2019. In summary, by 2019, it is projected that the Animal programs will surpass the Buoy programs as the largest consumer of Argos services in the U.S. portfolio.

### **3.3. 34<sup>th</sup> JTA meeting conclusions**

---

At the 34<sup>rd</sup> JTA meeting in 2014, the following was decided:

- As in 2013, the JTA costs have been closely controlled in 2014.
- Non-JTA activity remains stable and may increase should CLS continue to find new applications eligible to the Argos System.
- Total projected income is expected to be 7.18 M€ in 2014, compared to projected costs of 7.13 M€, resulting in a small positive year-end balance of 0.06 M€, and a net accumulated balance of 3.26 M€.
- In conclusion, the expected financial situation for 2014 is considered safe. The accumulated balance would remain significantly positive. Nevertheless, risks will continue to be monitored very closely by CLS.
- In reviewing the current five year plan, the meeting noted that the 2013 usage by the Large programme had not quite reached the threshold of 1200 PTT-years that were required to justify its preferential day rate (40% of the basic rate paid by all other users) due to the dramatic drifter failures experienced. The Chairperson referenced a decision taken at JTA EC 10 in Hamburg that for purposes of calculating whether usage meets the discounted threshold levels the usage will be averaged over the duration of this current five year plan.
- Based on (i) the projections for 2014 and 2015, in which it was expected that the income was balancing the JTA cost, (ii) the positive situation in the accumulated balance in the FYP at this moment, the meeting decided not to change the Tariff in 2015. The Meeting adopted the Terms and Conditions for the 2015 Agreement.

#### **Confirmation of 2015 tariffs at 34th JTA meeting:**

- **BASIC SERVICE**

Basic service charges for authorized users under this Agreement are in accordance with the payment on consumption.

They are calculated according to the following formula:

$$\text{Price per month, per platform} = \mathbf{A} + \mathbf{B} \times \mathbf{n}$$

where:

- **A** represents the monthly charge per active PTT (an active PTT is one that transmits at least once during a given calendar month);
- **B** represents the PTT-day unit rate;
- **n** is the number of day units. The day is divided into 4 time slots (0 - 6; 6 - 12; 12 - 18; 18 – 24 UTC). Any PTT transmission collected into a given time slot produces a 0.25 day unit.

A and B coefficients for all platform categories are provided in table below:

Category	A (€)	B (€)
<b>Buoys and others</b>	15	5
<b>Fixed Stations</b>	15	3
<b>Animals*</b>	15	7.5
<b>Subsurface Floats</b>	15	7.5

**Buoys and others** – PTTs in this category are drifting and moored buoys and, more generally, all those PTTs which do not belong to categories below.

**Fixed Stations** – PTTs in this category are land fixed PTTs.

**Animals** – PTTs in this category are those that are used to track animals.

\*Charges for Platforms in this category will be capped at n=12 Day Units per month.

**Floats** – PTTs in this category are subsurface floats such as the ARGO program floats.

- **DISCOUNT SCHEME FOR LARGE PROGRAMMES**

Number of platform-years	PTT-day unit (B) Buoys & others	PTT-day unit (B) Floats
600	4	6
900	3	4.5
1200	2	3

#### 4. Financial status of the Agent & Statement

##### 4.1. 2014 JTA financial close of accounts

In 2014, CLS recorded revenues from JTA participating countries at a level of 7.26 M€, a 2.2% increase from 2013 due to a larger contribution from large US programs.

As a consequence, in 2014, the JTA realized an excess of 350 K€. The non JTA incomes have remained essentially stable in 2014 (slight decrease from 6.30 M€ to 6.05 M€), and the corresponding applications (fishing and sensitive) are still exceeding significantly their portion of the costs.

At the date of the meeting, we believe the JTA in 2015 will likely be able to pay its portion of the cost with a small expected excess of 300 K€.

	2013	2014
JTA Operating Costs	7,03	6,91
JTA Income	7,10	7,26
Difference	0,07	0,35
<b>Cumulated Balance</b>	<b>3,2</b>	<b>3,55</b>

**4.2. Details of JTA and non JTA basic Argos Incomes and Expenses (in million Euros)**

Christophe Vassal presented the calculation of Argos costs to be attributed to the JTA.

He showed that the Argos basic costs are linked to the level of income. They are calculated at 12.01 M€ in 2014, the same level that they were in 2012.

The Argos basic costs for science are calculated at 7.25 M€ in 2014 representing 60% of the total basic costs, which is consistent with the percentage of scientific active PTTs in the Argos system.

In 2014, we had a total of 12,540 active PTTs used for scientific applications and 11,587 active and 366 inactive status or 11,953 PTTs under the JTA. Thus, JTA represents 95.32% of total active PTTs used for scientific applications. As a consequence, in 2014, the costs to be attributed to the JTA are calculated at 6.91 M€.

	2013	2014	
<b>Incomes</b>			
JTA CLS	3,19	3,10	
JTA CLS America	3,91	4,16	
	<b>7,10</b>	<b>7,26</b>	<b>2,25%</b>
Non JTA CLS	5,69	5,49	
Non JTA CLS America	0,61	0,56	
	<b>6,30</b>	<b>6,05</b>	<b>-3,97%</b>
<b>Total basic Argos incomes</b>	<b>13,40</b>	<b>13,31</b>	<b>-0,67%</b>
<b>Expenses</b>			
<b>Total basic Argos expenses</b>	<b>12,29</b>	<b>12,01</b>	<b>-2,28%</b>

## 4.3. The Five Year Plan for 2010-2014

In euro	2010 actual	2011 actual	2012 actual	2013 actual	2014 actual
<b>JTA Costs (M€)</b>					
cost increase %	5,0%	-3,78%	1,45%	0,72%	-1,71%
<b>Actual</b>	<b>7,15</b>	<b>6,88</b>	<b>6,98</b>	<b>7,03</b>	<b>6,91</b>
<b>JTA Income</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
	Actual	Actual	Actual	Actual	Actual
<b>Activity: Actual and Forecast</b>					
Growth Active PTTs (%)	5,7%	0%	-3%	-3%	-1%
Growth PTT-yrs (%)	6,9%	-7,4%	-10%	-4%	7%
Active PTFs (Total)	12 398	12 418	12 071	11 657	11 587
PTT-yrs (Total)	3 296	3 050	2 744	2 621	2 807
Active PTTs (w/o large program)	8 886	9 234	9 271	9 140	9 089
PTT-yrs (Buoys & Others)	454	382	320	315	251
PTT-yrs (floats w/o large pgm)	86	92	102	94	89
PTT-yrs (Animal)	916	973	1 002	1 049	1 110
PTT-yrs (Fixed stations)	140	129	128	116	123
Active PTTs (large pgm)	3 512	3 184	2 800	2 517	2 498
PTT-yrs (large pgm) Buoys & Others	1 572	1 341	1 065	939	1 148
PTT-yrs (large pgm) Floats	128	133	127	108	86
<b>Basic Service Income</b>					
Monthly fee (€)	15,0	15,0	15,0	15,0	15,0
Daily fee (€) buoys and others	5,50	5,00	5,00	5,00	5,00
Daily fee (€) floats	8,25	7,50	7,50	7,50	7,50
Daily fee (€) animals	8,25	7,50	7,50	7,50	7,50
Daily fee (€) fixed stations	3,00	3,00	3,00	3,00	3,00
Monthly fee (€) OCO	15	15	15	15	15
Daily fee (€) OCO buoys	2,00	2,00	2,00	2,00	2,00
Daily fee (€) OCO floats	3,00	3,00	3,00	3,00	3,00
Month unit income (M€)	1,60	1,66	1,67	1,65	1,64
Day unit income (M€)	4,08	3,75	3,75	3,83	3,88
Large pgm Day Unit Income (M€)	1,92	1,70	1,42	1,26	1,38
<b>Total basic service expected (M€)</b>	<b>7,60</b>	<b>7,11</b>	<b>6,84</b>	<b>6,73</b>	<b>6,89</b>
<b>Additional revenue</b>	<b>0,301</b>	<b>0,335</b>	<b>0,298</b>	<b>0,362</b>	<b>0,369</b>
<b>Year Balance</b>	<b>0,75</b>	<b>0,57</b>	<b>0,15</b>	<b>0,06</b>	<b>0,35</b>
<b>Carried forward from previous year</b>	<b>1,66</b>	<b>2,41</b>	<b>2,98</b>	<b>3,13</b>	<b>3,20</b>
<b>Cumulated Balance</b>	<b>2,41</b>	<b>2,98</b>	<b>3,13</b>	<b>3,20</b>	<b>3,55</b>

**ANNEX X**

**TERMS AND CONDITIONS OF THE GLOBAL AGREEMENT FOR 2016**

*(As agreed at JTA-35, October 2015)*

These Terms and Conditions outline costs for services to be provided by Collecte Localisation Satellites (affiliate of CNES).

**TIME PERIOD OF COVERAGE:**

These Terms and Conditions are valid for the time period beginning on **January 1 and ending on December 31, 2016.**

**DEFINITIONS**

"Platform-year" is defined as 366 days of operation of an acceptable Platform Transmitter Terminal (PTT).

"ROC" is the Responsible Organization representing a country or a group of countries.

"RO" is the Responsible Organization representing an agreed set of Argos User programs for the purposes of their collective participation in the JTA.

The "Agreement" includes all those participating countries which agree to the Terms and Conditions contained here in and are listed in Annex A to this Agreement

The "Large Programmes" are defined as those programmes that are funded and managed by a single organisation.

**BASIC SERVICES PROVIDED BY CLS**

CLS will perform the following categories of services associated with PTT's of the authorized users:

- (1) Location determination or both location determination and data collection for PTT's with a repetition period equal to or less than 120 seconds, application of calibration curves to the data when appropriate, access to the data and distribution of the data according to the paragraph below entitled "Distribution of processed data" and archiving for three months;
- (2) Data collection for (fixed station) PTT's with a repetition period equal to or greater than 200 seconds, application of calibration curves to the data when appropriate, access to the data and the distribution of the data according to the paragraph below entitled "Distribution of processed data" and archiving for three months;
- (3) Location service plus / auxiliary location
- (4) On-line data access ;
- (4) GTS Processing and Distribution

## USER BASIC SERVICE CHARGES

### BASIC SERVICE

Basic service charges for authorized users under this Agreement are in accordance with the payment on consumption.

They are calculated according to the following formula:

$$\text{Price per month, per platform} = \mathbf{A} + \mathbf{B} \times \mathbf{n}$$

where:

- **A** represents the monthly charge per active PTT (an active PTT is one that transmits a least once during a given calendar month)
- **B** represents the PTT-day rate.
- **n** is the number of day units. The day is divided into 4 time slots (0 - 6; 6 - 12; 12 - 18; 18 - 24 UTC). Any PTT transmission collected into a given time slot produces a 0.25 day unit. In 2006 the time slots will be applied only to Wildlife Applications and Subsurface Float categories.

A and B coefficients for all platform categories are provided in table below:

Category	A (€)	B (€)
<b>Buoys and Others</b>	15	5
<b>Fixed Station</b>	15	3
<b>Wildlife Applications (USA)*</b>	15	7.5
<b>Wildlife Applications (non US)*</b>	15	7
<b>Subsurface Float</b>	15	7.5

**Buoys and Others** – PTT's in this category are drifting and moored buoys, and more generally all those PTTs which do not belong to categories below.

**Fixed Station** – PTTs in this category are land fixed PTTs, a specific and set apart subset of Full Time PTTs.

**Wildlife Applications** – PTT's in this category are those that are used to track wildlife.

\*Charges for platforms in this category will be capped at n = 12 Day Units per month

**Floats** – PTT's in this category are subsurface floats such as the ARGO program floats.

### DISCOUNT SCHEME FOR LARGE PROGRAMMES

Number of platforms	PTT-day unit (B) Buoys & Others	PTT-day unit (B) Floats
600	4	6
900	3	4.5
1200	2	3



*UNUSED IDs*

PTTs which have not transmitted during a period of 24 months will be charged 5 € per month from the 25<sup>th</sup> month until the ID numbers are returned to CLS/Service Argos. This amount of unit charge will be applied until the ID number is formally returned to CLS by the User. The purpose of this fee is to recover IDs no longer required.

*SILENT SERVICE*

IDs remaining silent but still being used in an agreed programme will be considered by CLS on a case-by-case basis

*INACTIVE STATUS*

This status is intended for those platforms that continue to transmit but for which the location or data collection are of no further use to the user or the community. The following conditions must be met to qualify:

- (1) Inactive Status will apply if, and only if, Inactive Status is declared by the signatory of the System Use Agreement for platforms which continue to transmit beyond the programme termination. In that case, further charges will no longer be levied;
- (2) The platforms must have operated in Basic Service for a minimum of 2 months;
- (3) Data or location information cannot be retrieved nor can the platform revert to any category of service;
- (5) It is intended that Location and/or data collection may not be computed using a Local User Terminal or other direct readout facility;
- (6) ID numbers of such platforms are actually returned to CLS/Service Argos who will recycle them after the platform stops transmitting.

**ADDED SERVICES PROVIDED BY CLS AND NOT INCLUDED IN BASIC SERVICES**

Added services such as ArgosDirect (the former ADS, Databank) service, ArgosMonitor, Moored Buoy monitoring and others are provided by CLS and charged according to the yearly catalogue of prices.

**DESIGNATED ROC / RO**

.....  
.....  
.....  
.....

**DISTRIBUTION OF PROCESSED DATA**

- (1) These Terms and Conditions do not cover the costs of special additional services made to provide the processed data back to the users. These must be made by the user directly with CLS ;

- (2) However, it is understood that CLS will continue to provide data from PTT's via the World Weather Watch Global Telecommunication System (WWW/GTS) of the World Meteorological Organization (WMO) according to procedures established by WMO.

#### **BILLING AND PAYMENT**


CLS will send invoices on a two monthly basis (CLS America on a monthly basis) based on consumption to the organizations covered by the country agreement.

#### **GENERAL CONDITIONS OF AGREEMENT**

- (1) The designated ROC / RO and CLS jointly agree the list of users included in the Agreement and will update this list as appropriate. To assist in this process CLS will notify the ROC/RO of any new programmes that might qualify for this agreement.
- (2) For additional services not provided within this Agreement, individual users under this Agreement must negotiate directly with CLS. Payments associated with these negotiations must be settled on receipt of the invoice. If these conditions are not met, CLS may stop the distribution of the user's processed data.
- (3) Authorized users are defined as those implementing PTT's which are government funded. However, other users of agencies or organizations which are considered "non-profit" may be authorized. PTT's funded partly or entirely by private companies or organizations cannot be included in the conditions of this Agreement, even if data are supplied free of charge to national or international organizations. If these rules are not followed, CLS may stop the distribution of this user's data. Should this situation occur, CLS will immediately notify the ROC / RO. Nevertheless, active PTT's received by the system will be counted in the platform-year total and data stored.
- (4) All authorized users must sign a purchase order for each programme, either for the current year or for the duration of the programme, in order to clearly specify the services they request, whether these services are provided under this Agreement or not.
- (5) VAT will be charged to EU Members in accordance with EU rules.

  
Signed on behalf of the  
participating countries by the  
JTA Chairperson, Mr. Eric  
LOCKLEAR

30/11/2015  
/ /

Pour le Président  
du Directoire de CLS  
et par délégation  
  
Signed by CLS  
Chief Executive Officer  
Christophe VASSAL  
23/12/2015  
/ /

## ANNEX XI

### JTA OPERATING PRINCIPLES *(as agreed at the JTA-35 Meeting)*

#### Table of contents

1.	Introduction	
2.	Basic aims and principles of the Argos Joint Tariff Agreement (JTA)	
3.	The stakeholders' representation	
3.1	Representatives of Country (ROCs)	
3.2	Responsible Organizations (ROs)	
3.3	Representative of a User Group (RUG)	
3.4	CLS	
3.5	The Argos Operations Committee (OPSCOM)	
3.6	The WMO and IOC Secretariats	
4.	JTA office bearers	
5.	The JTA Executive Committee (JTA-EC)	
6.	Regular meeting of the JTA	
6.1	Structure	
6.2	Desired outcome:	
6.3	Invited participants	
6.4	Secretariat	
6.5	Typical agenda for JTA meetings	
6.6	Frequency	
7.	Typical intersessional workplan, and reporting process	
<b>ANNEX XI-A</b>	Role of the JTA Representative of Country (ROC)	108
<b>ANNEX XI-B</b>	Terms of Reference of the Argos Joint Tariff Agreement (JTA)	115
<b>ANNEX XI-C</b>	Terms of reference of the Representative of country (ROC)	116
<b>ANNEX XI-D</b>	Terms of reference of the Responsible Organization (RO)	118
<b>ANNEX XI-E</b>	Terms of Reference of a JTA Representative of a User Group (RUG)	120
<b>ANNEX XI-F</b>	Terms of Reference of the JTA Chairperson	122
<b>ANNEX XI-G</b>	Terms of Reference of the JTA vice-Chairperson	123
<b>ANNEX XI-H</b>	Terms of Reference of the JTA Executive Committee	124
<b>ANNEX XI-I</b>	Typical agenda for JTA Sessions	126
<b>ANNEX XI-J</b>	Typical JTA intersessional workplan, and reporting process	127
<b>ANNEX XI-K</b>	Format for the National Reports to the JTA	128
<b>ANNEX XI-L</b>	Proposed Terms of Reference of the Task Team on Wildlife Argos Applications	129
Annex XI-M	Ongoing action items	

## **1. Introduction**

The JTA provides for an international mechanism to provide for cost-effective location and data processing of data collected through the Argos system. The JTA is functioning through stakeholders whose roles are mainly to negotiate the Argos service level and tariff, and ensure appropriate coordination amongst Argos users in order to represent their collective interests with regard to Argos tariff and requirements. Stakeholders include:

- i. Representatives of Country (ROCs) representing a country or a group of countries from responsible government organizations using Argos;
- ii. Responsible Organizations (ROs) representing an agreed set of Argos user programmes;
- iii. Representatives of Users Groups (RUGs);
- iv. Representatives of the Argos satellite system operator and service provider;
- v. Representatives of the Argos Operations Committee (OPSCOM);
- vi. Representatives of the WMO and IOC Secretariats.

## **2. Basic aims and principles of the Argos Joint Tariff Agreement (JTA)**

2.1 The basic aims and principles, based on the discussion at the JTA-23 (Angra dos Reis, 2003), was agreed at the JTA-29 (Paris, 2009) as follows:

- i. The benefits of JTA participation should be shared equally amongst all participants (Users).
- ii. The revenue collected from Users should meet the costs of providing the service.
- iii. Developments required by Users should be funded by Users.
- iv. Costs of developments not of benefit (or of marginal benefit) and not driven by User requirements should not fall on Users.
- v. There should be a clear division between a basic (funded) service and other (e.g. value added) services.
- vi. The Tariff structure should be simplified to reduce the number of service categories.
- vii. System developments should be fully endorsed by JTA and those affecting Users agreed in advance.

2.2 The Terms of Reference of the Argos Joint Tariff Agreement (JTA) are given in Annex XI-B.

## **3. The stakeholders' representation**

### **3.1 Representatives of Country (ROCs)**

ROCs are representing a country or a group of countries from responsible government organizations using Argos. The role of the ROCs is detailed in Annex XI-A. The Terms of Reference of the ROCs, including mechanism for their nomination are provided in Annex XI-C.

### **3.2 Responsible Organizations (ROs)**

3.2.1 An RO is the Responsible Organization representing an agreed set of Argos User programmes for the purposes of their collective participation in the JTA. The concept of RO can accommodate groups of countries such as E-SURFMAR, as well as large individual programmes as necessary or convenient.

3.2.2 As agreed at JTA-24, the functions of an RO include:

- i. preparing consolidated estimates of Argos usage for the annual JTA budget planning and negotiation of tariff Terms and Conditions;
- ii. representing the collective interests of the User programmes in respect of the Argos service provision and forward planning

3.2.3 A RO would provide local support for Argos applications, and facilitate the interface between CLS Argos and the User programmes for which the RO is responsible, including:

- i. providing support to members of the RO's User group

3.2.4 The Terms of Reference of the ROs are provided in Annex XI-D.

### 3.3 Representative of a User Group (RUG)

3.3.1 A Representative of a User Group (RUG) is an individual who can fairly represent the overall consensus view of a significant Argos JTA user community. Such communities might reasonably include the operators of data buoys, floats, ice platforms, animal tags, land stations, ship stations and airborne stations, or bodies with agreed international responsibilities for the promotion, sponsorship or validation of any aspect of environmental observation using Argos (e.g. IOC, WMO, WWF). The RUG will work with CLS and the JTA Executive Committee to identify opportunities that might bring the JTA session into closer contact with his/her user group, with a view to establishing within that group the benefits of the JTA process.

3.3.2 The Terms of Reference of a JTA Representative of a User Group (RUG), including mechanism for their nomination are provided in Annex XI-E.

### 3.4 CLS

3.4.1 CLS is the designated agent of CNES to operate the Argos system ground segment and to promote the use of it. Those Argos basic services are provided at cost to the users under the oversight of the Argos Operation Committee (CNES, NOAA, EUMETSAT, ISRO).

3.4.2 CLS role with regard to the Argos and the JTA is:

- i. to report to the JTA on developments and operations, related to the use and performances of the system;
- ii. to report to the JTA on overall costs and recovery of expenditures through service charges; this includes, in particular, the preparation of and the annual assessment of the JTA Five Year Plan (FYP);
- iii. to collect requirements from the user community and implement required solutions when possible;
- iv. to interface with the participating space agencies to assist in providing system upgrades if requested;
- v. to interface with manufacturers to certify their transmitter products and to provide engineering assistance to them to insure their hardware operates correctly and efficiently with the Argos system, thereby increasing and optimizing Argos system usage;
- vi. to develop and maintain the ground system and the Global data processing centres;

- vii. to operate the Argos ground segment;
- viii. to operate the Global processing centres under quality of service agreements and deliver data collected to the user community (including international programmes such as WIGOS, IODE, GFCS, MOVEBANK, OBIS, etc.) according to international standard data exchange requirements and protocols;
- ix. to perform multiple levels of quality of control on the data;
- x. to store all data processed for a duration of 12 months and to make it easily extractable in response to user requests;
- xi. to monitor and control the overall performances of the systems so as to guarantee the level of quality and continuity of service;
- xii. to promote the use of the Argos system and market new user communities, with the goal of minimizing the cost of using Argos;
- xiii. to support users through responsive customer service for any request, claim or declaration of equipment;
- xiv. to support the JTA Executive Committee in JTA management and operations;
- xv. to support ROCs and ROs as needed especially by facilitating access to and interaction between them and the user communities;
- xvi. CLS to present breakdown of JTA income by platform type.
- xvii. to ensure web availability of data required by ROC's

### 3.5 The Argos Operations Committee (OPSCOM)

3.5.1 The Argos Operations Committee (OPSCOM) was established by the Memorandum of Understanding (MoU) signed by the National Oceanic and Atmospheric Administration (NOAA) of the United States of America, and the Centre National d'Etudes Spatiales (CNES) of France, who affirmed their desire to conduct a space applications project of mutual interest for peaceful purposes. The MoU was intended to govern the cooperation between NOAA and CNES for the implementation and the use of the Argos Data Collection and Platform Location System (Argos Data Collection System).

3.5.2 Agencies signing the MoU recognize their common interest in promoting maximum use of the Argos system through enhanced service and cost-effective operations. In this context, one of the objectives is to achieve a self-sustaining system with revenues from users fully offsetting operating costs. The Argos Operations Committee is reviewing the implementation and supervising the operations of the Argos Data Collection System. The Committee meets in principle, annually.

3.5.3 The OPSCOM in particular reviews the Argos Data Collection System development and implementation activities and recommends to the Project Managers and the signatories to the MOU appropriate measures for accomplishing the objectives of the project. It reviews and approves applications and formulates criteria for approval of applications received from prospective platform operators for the use of the Argos Data Collection System.

3.5.4 The arrangements, including cost considerations, for the performance of platform allocation, verification of the calibration data, system quality control, conversion of telemetry data into physical parameters, and computations for platform location is delegated by CNES to its agent and operations capacity according to the tariff structure and other guidelines submitted to and approved by the Operations Committee.

3.5.5 Tariffs associated with these functions are collected to offset the operating costs of the Argos Data Processing System. Tariff receipts that exceed these costs are used for Argos Data

Processing System improvements and/or to reduce tariffs to System platform users as approved by the Operations Committee.

### 3.6 The WMO and IOC Secretariats

The World Meteorological Organization (WMO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO recognize that satellite data telecommunication systems are important components for the implementation and sustainability of global met-ocean observing networks. WMO and IOC endorse the JTA as a mechanism to cost-effectively address the requirements of WMO and IOC Programmes and Co-sponsored Programmes, in particular in terms of Argos satellite data telecommunication and related data processing, quality control, data encoding according to international standards, and data distribution to their end users. In order to facilitate the JTA achieving its goals, the Secretariats of both Organizations will provide support for the following functions:

Support the JTA Chairperson in the following manner:

- i. Working with the JTA Executive Committee (JTA-EC), and its Chairperson to identify hosts for the regular meetings; and to work with the hosts to gather and disseminate logistical information to the participants;
- ii. Providing financial assistance and administrative support to JTA participants who have been nominated by the JTA-EC to receive such assistance;
- iii. Issuing JTA meetings' invitation letters to the Argos JTA Representatives of Countries (ROCs) with copies to the Permanent Representatives of WMO Members participating in JCOMM activities;
- iv. Managing the documentation in preparation of the JTA meetings;
- v. Participating at the Sessions of the JTA and its Executive Committee meetings;
- vi. Preparing the session's final report template, and collaborating with the Chair, and the JTA Executive Committee for recording the Session's decisions, and issuing reports of JTA Sessions;
- vii. Finalizing the issuance and distribution of Session reports of the JTA to WMO Members, IOC Member States, as well as to the ROCs and other participants;
- viii. Coordinating and communicating with the ROCs, the JTA Chair and the Executive Committee on all related issues during the intersessional periods;
- ix. Need to capture actions and issues from national reports, as well as reporting upon action items as stipulated at JTA and JTA-EC meetings, and provide them to the Chairperson;
- x. Serve as members of the JTA Executive Committee (*ex officio*).

The representatives of WMO and IOC will participate in JTA Sessions as stakeholders, representing the interests of both Organizations.

Reimbursement to the IOC and WMO for Administrative support should be made by the JTA. The amount reimbursed is to be reviewed annually by the JTA-EC and approved by the Chairperson for the upcoming session.

## **4. JTA office bearers**

4.1 The JTA elects a Chairperson and vice-Chairperson at JTA Sessions. The primary duty of the Chairperson is to ensure that the JTA negotiations proceed in as open and equitable a way as possible, and to assist in reconciling the needs of Argos stakeholders through an agreed

negotiation process regarding future service level provision and costs. The vice-Chairperson shall deputize for the Chairperson in his/her duties if required by the Chairperson.

4.2 The Terms of Reference for the JTA Chairperson, and the JTA vice-Chairperson, details about their election and terms are provided in Annexes XI-F and XI-G respectively.

## **5. The JTA Executive Committee (JTA-EC)**

5.1 The function of the JTA Executive Committee (JTA-EC) is to conduct the sessional and intersessional business, as well as all other matters in support of the Chairperson's duties to meet the needs of the JTA members.

5.2 The Terms of Reference of the JTA Executive Committee are provided in Annex XI-H.

## **6. Regular meeting of the JTA**

### **6.1 Structure**

The structure of the meeting consists of deliberative and report producing sessions over 3 days that are directed by the Chairperson to achieve the desired outcome. It is expected that the agenda, as adopted by the JTA at the start of the session, will be followed.

### **6.2 Desired outcome:**

The desired outcome of the JTA Session is to be an open forum for all members to discuss and agree by consensus on any matter that affects their use of the Argos satellite data communications and processing system.



### 6.3 Invited participants

There is an open invitation to all members of all stakeholder groups to attend the JTA annual meeting. However, official invitation by the IOC and WMO will be made to the following:

- Representatives of Country (ROCs) representing a country or a group of countries from responsible government organizations using Argos
- Responsible Organizations (ROs) representing an agreed set of Argos user programmes
- Representatives of the Argos satellite system operator and service provider
- Representatives of the Argos Operations Committee (OPSCOM)
- The Executive Committee may appoint a consultant(s)/advisor(s) which may not necessarily be formally related to a particular group, organisation or country to assist in specific tasks.

### 6.4 Secretariat

It is expected that Secretariat support for the JTA meetings will be provided by the WMO and IOC on a rotating basis. Responsibilities of the Secretariats in administering the meeting are outlined in letters from IOC and WMO to the JTA Chair.

6.5 The typical agenda for JTA meetings is provided in Annex XI-I.

### 6.6 Frequency

The JTA Session should be held annually, but the schedule may be changed at the discretion of the Chairperson.

## 7. **Typical intersessional workplan and reporting process**

The following schedule is proposed. The actual workplan will be implemented by the Chairperson and will include a combination of meetings, teleconferences, and email. A typical intersessional workplan and the reporting process is detailed in Annex XI-J.

---

## ANNEX XI-A

### ROLE OF THE JTA REPRESENTATIVE OF COUNTRY (ROC) (as agreed at the JTA-28)

#### HISTORICAL OVERVIEW

The concept of ROC was introduced at the first meeting on Argos Joint Tariff Agreement (JTA-I) (Geneva, Switzerland, December 1981). The Meeting adopted a proposal «which foresees that agreements will be signed directly between the user Representative\* and Service Argos.» The note under the \* reads: «Representative is a unique Representative Organization for a country or a group of countries as given in the Global Agreement.» The Global Agreement starts with the following sentence: «These Terms and Conditions outline costs to and services to be provided by Service Argos of CNES and the (\*)..... jointly providing support to their own authorized users for the location and data processing associated with the implementation and testing of remote platforms communicating with the satellites of the TIROS-N series.» The note under the (\*) reads: «Quote the country and its own organization in charge of the Agreement with regards to CNES Service Argos. Hereafter defined by "ROC", i.e., a unique Representative Organization for a Country or a group of countries.»

That wording remained unchanged (except «Service Argos of CNES» being replaced by «Collecte Localisation Satellites», beginning in 1987, and «the satellites of the TIROS-N series» being replaced by «Argos capable satellites», beginning in 2003) until and including the "usual" Global Agreement for 2005. In the Agreement for 2005 regarding the Pilot Programme for the New Tariff Scheme, one reads: «These Terms and Conditions outline costs to and services to be provided by Collecte Localisation Satellites (1) hereafter referred to as "CLS" and the countries listed below, but not be limited to: [etc.]», and the note reads: «Quote the country and its own organization in charge of the Agreement with regard to CLS. Hereafter defined by "ROC / RO / Programme Manager", i.e. a unique Representative Organization for a country, a group of countries, or a single programme.» In addition, under DEFINITIONS, the following is added: «"RO" is the responsible Organization representing an agreed set of Argos User programmes for the purpose of their collective participation in the JTA.»

The Global Agreement for 2006 comes back to the initial wording, with a slight change in the note: «Quote the country and / or the organization in charge of the Agreement with regard to CLS, hereafter defined by "ROC / RO"» and the addition, under DEFINITIONS, of: «"ROC" is the Representative of Country and "RO" is Responsible Organization.»

The Global Agreement for 2007 reads: «These Terms and Conditions outline costs to and services to be provided by Collecte Localisation Satellites (affiliate of CNES in charge of operating the Argos system), hereafter referred to as "CLS" and all the countries participating in the JTA.» The definitions of ROC and RO remain unchanged.

Lastly, the Global Agreement for 2008 reads: «These Terms and Conditions outline costs for services to be provided by Collecte Localisation Satellites (affiliate of CNES).» The definition of ROC becomes the one adopted by JTA-27 and used in this document.

#### CONTEXT

The terms of the Joint Tariff Agreement require that the agreement is negotiated within an intergovernmental forum. This is achieved because, and only because, the invitation letters

to the meetings are addressed by the joint Secretariat to the official representatives of Members / Member States of WMO / IOC. These invitation letters are systematically copied to the ROCs, who therefore may attend the meetings, whatever their official status may be (governmental representatives or "advisers"). This has been done on purpose since the first meeting because: (i) the ROCs are the only really knowledgeable people in their countries regarding JTA activities; and (ii) nobody could foresee what might be the official status of the ROC in each and every country (see "NOMINATION AND RECOGNITION OF ROC" below).

The tariff agreement has been negotiated annually since its inception, with the objective of assuring the long term viability and development of the CLS / Argos data service, and in turn securing preferential (cost-recovery) and globally-consistent pricing arrangements for government or not-for-profit funded environmental monitoring programmes within the JTA participant countries.

The Representative of Country (ROC) is the person representing a country or a group of countries from a responsible government organization. The ROC may be required to keep other government agencies informed of the activities of CLS / Argos in order to justify the use of the Argos transmitters (PTTs) within national boundaries and their status within current communication policies. The ROC is the Responsible Authority representing an agreed set of Argos User programmes for the purposes of their collective participation in the JTA.

The tariff structure, price-setting arrangements and relationships between CLS / Argos, User Programmes and the ROCs have changed significantly since 2005. Changes include the introduction of a simplified tariff, the establishment of direct contracts and billing arrangements between CLS / Argos and end-user programmes, and, in some cases, the entry of local CLS / Argos representatives with the capacity to provide end user support. In the process, the "traditional" role of ROCs, their relationship with users and with CLS / Argos, and their contribution to annual tariff negotiations have been altered. ROCs' roles around the world have also become less homogeneous.

This document sets out the role of a ROC, and the relationships, expectations and obligations between ROCs, end users, CLS / Argos and other stakeholders (e.g. OPSCOM), in the context of the current tariff structure.

## NOMINATION AND RECOGNITION OF ROC

Each and every country nominates (or not, see below) its ROC as it wishes. In general, the ROC is nominated by an official representative of the Member / Member State of WMO / IOC and has therefore the status of a governmental representative. But this is not always the case: in some instances, for example, the ROC may be just "defined" through an agreement between a programme manager and CLS, and accepted as such by the JTA Meeting because of its de facto position. Other possibilities may (and do) happen. None would impinge upon the intergovernmental status of the Meeting on Argos Joint Tariff Agreement (see 1st paragraph in the "CONTEXT" section above).

## ROLE OF THE ROC - GENERAL

The ROC is to ensure that the Argos system meets the basic requirements of all system user groups in the most cost-effective way within the principles of fairness, openness and the promotion of science.

## ROC ROLES – CLS/Argos INTERFACE

- Tariff charge rate negotiation. Review CLS / Argos financial analyses, and approve the level of expenses to be attributed to JTA user programmes support. Negotiate tariff structures (including for Iridium services) that will fund the costs of the JTA service, to achieve globally consistent, predictable and equitable service pricing arrangements for all user classes (i.e. across the range of environmental science applications);
- High level advocacy of user programmes and user service classes. Provide high level collective advocacy of all user programmes and user service classes to CLS / Argos to assure long term stability of the environmental data service for all end user service classes, and effective management of service or charge rate transitions;
- Representation of user requirements: Gather user requirements (current service, shortcomings, enhancements and future requirements) and relay to CLS/Argos as a basis for system enhancement, ground system corrective actions, enhancements or strategic investment.
- Endorsement of service investments. Review and endorse investments needed to sustain and enhance the CLS / Argos provision of basic services, and ensure the forward funding basis for such investments;
- Provision of independent advice to end-users. Represent CLS / Argos service capabilities to end-users (existing or candidate) and provide limited support to enable users to make appropriate decisions, and to resolve service problems. Support may be in the form of technical advice, referral to peer programmes, etc. It is to be provided in the context of existing primary support through equipment suppliers and CLS / Argos channels, not as an alternative to those arrangements;
- Adjudication of JTA programme eligibility. On referral from CLS / Argos, adjudicate the eligibility of new user programmes for inclusion in the JTA;
- Submission of a National Report to the JTA Meeting. Provide a National Report to the JTA meeting, at least one month prior to the meeting. The content shall follow the current report guidance; and
- Attendance at JTA meetings. ROCs are expected to attend JTA meetings. Alternatively they are to consider the materials circulated prior to the JTA meeting, and to ensure that the interests of the user programmes they represent are adequately conveyed through a ROC who will be attending the meeting, or else through their National Report.
- News items. Provide suitable Argos news items to CLS.

Enabling Actions to Support the ROC's Role

- CLS / Argos is to provide transparent and timely disclosure of the costs attributed to providing JTA services, and the basis for such cost attribution, at least 3 weeks in advance of new tariff negotiations;
- Outcomes of the most recent OPSCOM review of CLS finances are to be made available to ROCs through the JTA Chairperson's report to the JTA;
- CLS / Argos is to notify ROCs of user sign-ups as they occur, and to provide regular reporting of service usage by programmes in the country (or countries) represented by a ROC. The CLS / Argos Usage Reports are to be provided quarterly, in a spreadsheet form that enables ready analysis of the data;
- The CLS / Argos is to provide advice to all users on the ROC's role, and the contact details of the local ROC at the time of initiating new service contracts; and
- ROCs are to invite user communication, and may solicit specific user feedback on matters pertinent to their role, but are not expected to initiate formal user group surveys. CLS/Argos shall notify ROCs of user forums that it organizes.

### Issues

- Commercial sensitivity of material. The potential for the introduction of competitors to CLS / Argos in data communications and data management services may further affect the role of the ROC, and the nature of the JTA's strategic planning and budgeting process. It may also increase the potential for perceived conflict in the relationships between CLS / Argos and ROCs, and the sensitivity of information disclosures needed for the tariff negotiation. In such circumstances, it may become prudent to conduct some aspects of tariff negotiation through a smaller group, operating on behalf of the full ROC membership; and
- Funding of ROC participation in JTA. CLS / Argos is requested to consider options for collecting funding through the JTA revenues for funding of ROC participation in the JTA. Any funding of the ROC through CLS must be done very carefully to avoid a real or perceived conflict of interest.

Decision regarding the use of the funds should be made by the JTA Chairperson after consultation with the EC. The JTA Chairperson will then inform the DBCP Chairperson who will in turn request WMO to make expenditures.

### ROC ROLES - INTERFACE WITH END USER PROGRAMMES

ROCs provide the following value to end users:

- Insight into CLS / Argos operation and directions. Provide insight into the operations of the CLS / Argos data service, how it (and the tariff) operates, how it might change in the future, and what affect that might have on user programmes;
- Assurance of global tariff consistency, stability and predictability;
- Opportunities for cross - fertilization. Provide a point of reference to other (like or complementary) programmes, nationally or globally; and
- Impartial, high-level representation to CLS / Argos. Provision of an influential, impartial voice in tariff negotiations and in specific problem resolution.

### ROC ROLES - SUPPLIER INTERACTIONS

- There is no formal relationship or exchange required between ROCs and suppliers, but ROCs are encouraged maintain a level of familiarity with PTT technology appropriate to their role.

#### Enabling Actions to Support the ROC's Role

- CLS / Argos is to ensure suppliers are familiar with the ROC's role, and to encourage supplier contact with ROCs; and

- CLS / Argos is to facilitate ROC / supplier interactions, e.g., by invitation to user-supplier forums organized by CLS / Argos.

## ROC ROLE - OPSCOM RELATIONSHIP

OPSCOM requires nationally-based user representation in tariff negotiations. No formal direct relationship is required with the ROC, only interactions through the JTA.

## ROC - ROC RELATIONSHIP

- It would be a time challenge but regular teleconferences (once every three months), to discuss user issues and provide recommendations to the JTA meeting, might be an idea. It is probably more realistic to have the discussion using email in which case a ROC's mailing list needs to be hosted somewhere; and
  - *To be further developed.*
-



## ANNEX XI-B

### TERMS OF REFERENCE OF THE ARGOS JOINT TARIFF AGREEMENT (JTA)

The JTA provides for an international mechanism to provide for cost-effective location and data processing of data collected through the Argos system. The JTA is functioning through stakeholders whose roles are mainly to negotiate the Argos service level and tariff, and ensure appropriate coordination amongst Argos users in order to represent their collective interests with regard to Argos tariff and requirements. Stakeholders include:

- i. Representatives of Country (ROCs) representing a country or a group of countries from responsible government organizations using Argos;
- ii. Responsible Organizations (ROs) representing an agreed set of Argos user programmes;
- iii. Representatives of Users Groups (RUGs);
- iv. Representatives of the Argos satellite system operator and service provider;
- v. Representatives of the Argos Operations Committee (OPSCOM);
- vi. Representatives of the WMO and IOC Secretariats.

The JTA shall:

1. be responsible for negotiating on a yearly basis fair, cost-effective, and simple terms and conditions of the global agreement covering Argos user charges that are applicable to Argos programmes funded by national governments of WMO and IOC Members/Member states and/or other JTA approved organizations;
2. review requirements from Argos user groups and make proposals for inclusion of specific developments in the Argos development programme taking into account their potential impact on the Argos tariff;
3. approve the role of the ROCs;
4. elect an Executive Committee, chaired by the JTA Chairperson, and including the vice-Chairperson, and stakeholder representatives;
5. review and agree on its operating principles;
6. report, through the Chairperson, to the Argos Operations Committee (OPSCOM) and submit its recommendations regarding Argos tariff and required Argos system developments for agreement.

Decisions shall be agreed unanimously by the JTA. If decisions cannot be agreed unanimously, they will be deferred to the Executive Committee for further discussion and decision.

## ANNEX XI-C

### TERMS OF REFERENCE OF THE REPRESENTATIVE OF COUNTRY (ROC)

The Representative of Country (ROC):

1. should be nominated by a (semi-) governmental (e.g. non-profit) organization being an Permanent Representative of a Member (State) of WMO or IOC; ROCs are designated through either of the following mechanisms:
  - i. An agency or consortium who wishes to become a ROC consults with CLS to check whether there is already a ROC in the country, and whether there are other institutions using Argos in the country;
  - ii. The agency or consortium consults with other Argos users in the country;
  - iii. If not being the Permanent Representative of a Member (State) of WMO or the IOC Action Addressee, the agency or consortium writes to the Permanent Representative of a Member (State) of WMO or the IOC Action Addressee asking the Permanent Representative of a Member (State) of WMO or the IOC Action Addressee to inform the JTA Chairperson that the agency is to be added in the list of ROCs;
  - iv. In case there are two or more agencies in a country asking to be a ROC, the JTA Chairperson writes to the WMO or IOC Secretariats asking them to contact the Permanent Representative of the Country with WMO, or the IOC Action Addressee from that country in order to suggest that the country makes a formal nomination through the WMO and/or IOC channels, i.e. by means of either:
    - a. A letter issued by the Permanent Representatives of a country to WMO to the Secretary General of WMO;
    - b. A letter issued by the IOC Action Addressee of a country to the Executive Secretary, IOC;
2. should collect (changes in) requirements from national users and bring these to the attention of CLS/Argos at JTA meetings;
3. could designate an alternate to act on its behalf at JTA meetings by means of a letter to the JTA Chairperson;
4. decides on nominations and proposals put forward by the Executive Committee (EC);
5. is the only authority in the JTA to represent the user groups in a country and to decide on matters related to the global tariff and service level;
6. should initiate interaction with their users, or act as the focal point when deemed to be appropriate or being considered necessary;
7. will provide basic support to (new) users based on information made available by CLS;
8. interacts with CLS when deemed to be necessary or required;

9. participates in the yearly negotiation for the tariff and service level based on a financial review by the OPSCOM and the EC;
10. monitors the usage of the Argos system by its users using statistical information made available by CLS on the Argos Website;
11. will provide a report to the JTA meeting at least 1 (one) month prior to the meeting date, in a format following the current reporting structure which will include the capturing of actions and issues from the national report for circulation prior to the meeting and for discussion;
12. will, at the request of CLS, agree on new user programmes that qualify for inclusion under the Global Agreement;
13. may, if national law requires that, be obliged to keep other national governmental agencies informed about the activities of CLS in order to justify the use of the Argos transmitters (PTTs, PMTs) within national boundaries and their status within current communication policies;
14. should, upon request of CLS, not distribute or communicate commercially sensitive information provided by CLS to the ROCs;
15. Need to capture actions and issues from national reports, and provide them to the Chairperson;
16. to consult web list of unused IDs and to be proactive with their users;
17. to provide suitable Argos news items to CLS.

## ANNEX XI-D

### TERMS OF REFERENCE OF THE REPRESENTATIVE OF ORGANIZATION (RO)

The Representative of Organization (RO):

1. should be nominated by a (semi-) governmental (e.g. non-profit) organization being an official representative of a Member (State) of WMO or IOC;

ROs are designated through either of the following mechanisms:

- i. An agency or consortium who wishes to become a RO consults with CLS to check whether there is already a RO for the consortium, and whether there are other institutions using Argos in the corresponding country(ies);
  - ii. The agency or consortium consults with other Argos users and ROCs in the corresponding country(ies);
  - iii. If not being the Permanent Representative of a Member (State) of WMO or the IOC Action Addressee, the agency or consortium writes to the Permanent Representative of a Member (State) of WMO or the IOC Action Addressee asking the Permanent Representative of a Member (State) of WMO or the IOC Action Addressee to inform the JTA Chairperson that the agency is to be added in the list of ROs;
  - iv. The ROs are formally endorsed at the annual JTA session.
2. should collect (changes in) requirements from its users and bring these to the attention of CLS/Argos at JTA meetings;
3. could designate an alternate to act on its behalf at JTA meetings by means of a letter to the JTA Chairperson;
4. decides on nominations and proposals put forward by the Executive Committee (EC);
5. is the only authority in the JTA to represent the agency or consortium and to decide on matters related to the global tariff and service level;
6. should initiate interaction with their users, or act as the focal point when deemed to be appropriate or being considered necessary;
7. will provide basic support to (new) users based on information made available by CLS;
8. interacts with CLS when deemed to be necessary or required;
9. participates in the yearly negotiation for the tariff and service level based on a financial review by the OPSCOM and the EC;
10. monitors the usage of the Argos system by its users using statistical information made available by CLS on the Argos website;
11. will provide a report to the JTA meeting at least 1 (one) month prior to the meeting date, in a format following the current reporting structure which will include the capturing of actions and issues from the national report for circulation prior to the meeting and for discussion;

12. will, on request of CLS, agree on new user programmes that qualify for inclusion under the Global Agreement;
  13. may, if national law requires that, be obliged to keep other national governmental agencies informed about the activities of CLS in order to justify the use of the Argos transmitters (PTTs, PMTs) within national boundaries and their status within current communication policies;
  14. should, upon request of CLS, not distribute or communicate commercial sensitive information provided by CLS to the ROs;
  15. Need to capture actions and issues from national reports, and provide them to the Chairperson;
  16. to consult web list of unused IDs and to be proactive with their users;
  17. to provide suitable Argos news items to CLS.
-

## ANNEX XI-E

### TERMS OF REFERENCE OF A JTA REPRESENTATIVE OF A USER GROUP (RUG)

The Argos JTA meeting is an open meeting that solicits views from Argos 'stakeholders' (representatives of user groups, ROCs, intergovernmental and international bodies, the satellite operators and service providers), and attempts to address and reconcile the needs of these bodies through negotiation regarding future service level provision and costs.

RUGs are designated through either of the following mechanisms:

- i. An agency or consortium who wishes to become a RUG consults with CLS to check whether there is already a RUG for the consortium, and whether there are other institutions using Argos in the corresponding country(ies);
- ii. The agency or consortium consults with other Argos users, ROCs, and ROs in the corresponding country(ies);
- iii. If not being the Permanent Representative of a Member (State) of WMO or the IOC Action Addressee, the agency or consortium writes to the JTA Chairman that the agency is to be added in the list of RUGs
- iv. The RUGs are formally endorsed at the annual JTA session.

In this context a Representative of User Group' (RUG) is defined as follows, with the following Terms of Reference:

- i. A RUG will be an individual who can fairly represent the overall consensus view of a significant Argos JTA user community. Such communities might reasonably include the operators of data buoys, floats, ice platforms, animal tags, land stations, ship stations and airborne stations, or bodies with agreed international responsibilities for the promotion, sponsorship or validation of any aspect of environmental observation using Argos (e.g. IOC, WMO, WWF).
- ii. It is accepted that for certain user groups (e.g. animal trackers), accreditation as above might be difficult to establish in the short term. Nonetheless the JTA-EC will work proactively to seek and encourage the identification of RUGs as essential components of any meaningful JTA negotiation process, and will be lenient in applying the above constraint.
- iii. Notwithstanding the above, the JTA sessions are open with observer status to any interested person (see JTA TORs).
- iv. If accredited, a RUG will be obliged to consult as widely as possible with his/her user community regarding their use and expectations of the Argos system, and to make the results of these consultations publicly available well in advance of JTA sessions.
- v. The RUG will also be expected to act as an impartial focal point for the dissemination of relevant information regarding Argos that might be of benefit to his/her user community.
- vi. In return, the RUG will receive a letter of accreditation, and may be able to request some level of financial support from CLS for attendance at meetings and for other activities approved by the JTA-EC and CLS.
- vii. The RUG will work with CLS and the JTA-EC to identify opportunities that might bring the JTA session into closer contact with his/her user group, with a view to establishing within that group the benefits of the JTA process.
- viii. Need to capture actions and issues from national reports, and provide them to the Chairperson;

- ix. To consult web list of unused IDs and to be proactive with their users;
  - x. To provide suitable Argos news items to CLS.
-

## **ANNEX XI-F**

### **TERMS OF REFERENCE OF THE JTA CHAIRPERSON**

The Argos JTA meeting is an open meeting that solicits views from Argos 'stakeholders' (representatives of user groups, ROCs, intergovernmental and international bodies, the satellite operators and service providers), and attempts to address and reconcile the needs of these bodies through an agreed negotiation process regarding future service level provision and costs. The primary duty of the Chairperson is to ensure that these negotiations proceed in as open and equitable a way as possible.

The JTA shall elect a Chairperson from WMO and IOC Members/Member States at JTA Sessions. The term for the Chairperson will be for two years. The Chairperson shall be eligible for re-election in his/her capacity as Chairperson, but in principle only for one subsequent term.

Terms of Reference for the JTA Chairperson:

1. The Chairperson shall be impartial and shall not favour any particular group, organisation or country.
2. In consultation with the Secretariat, the Executive Committee (JTA-EC) and CLS, the Chairperson shall prepare the agenda, and confirm the venue for the annual session for distribution by the secretariat.
3. The Chairperson shall conduct the annual session of the JTA, and promote free, equitable and open discussion of agenda items.
4. The Chairperson shall convene intersessional meetings of the JTA-EC as necessary.
5. The Chairperson shall regularly liaise with CLS with regard to developments that might impact the JTA and its members and may visit CLS as the need arises;
6. The Chairperson shall routinely circulate information to the JTA participants during the intersessional period as appropriate;
7. The Chairperson shall deputize the vice-Chairperson if required.
8. The Chairperson shall represent the agreed views, decisions, and requirements of the JTA at OPSCOM and other sessions as appropriate, and report back on the outcomes to subsequent meetings of the JTA-EC and JTA.
9. The Chairperson, assisted by the secretariat and members of the JTA-EC if required, shall prepare and finalize reports of the JTA and its JTA-EC, and submit them to the Secretariats for publication if necessary.
10. The Chairperson, in consultation with the JTA-EC and other stakeholders, shall nominate membership of the JTA-EC, and approve new ROCs and ROs.
11. Need to capture and summarize actions and issues from national reports.



## **ANNEX XI-G**

### **TERMS OF REFERENCE OF THE JTA VICE-CHAIRPERSON**

The Argos JTA meeting is an open meeting that solicits views from Argos 'stakeholders' (representatives of user groups, ROCs, intergovernmental and international bodies, the satellite operators and service providers), and attempts to address and reconcile the needs of these bodies through an agreed negotiation process regarding future service level provision and costs. The primary duty of the Chairperson is to ensure that these negotiations proceed in as open and equitable a way as possible.

The JTA shall elect a vice-Chairperson from WMO and IOC Members/Member States at JTA Sessions. The term for the vice-Chairperson will be for two years. The vice-Chairperson shall be eligible for re-election in his/her capacity as vice-Chairperson, but in principle only for one subsequent term.

Terms of Reference for the JTA vice-Chairperson:

- The Chairperson shall deputize the Vice-Chairperson for all of the duties (except for item number 7 of the JTA Chairperson's ToR) if required.

---

## **ANNEX XI-H**

### **TERMS OF REFERENCE OF THE JTA EXECUTIVE COMMITTEE**

The function of the JTA Executive Committee (JTA-EC) is to conduct the sessional and intersessional business, as well as all other matters in support of the Chairperson's duties to meet the needs of the JTA members.

#### Terms of Reference

The specific tasks of the JTA-EC are to:

1. Assist the chairperson and secretariat in the preparation of reports, reviewing action items of previous JTA meetings, and their submission, if needed, to the IOC and WMO Secretariats for distribution.
2. Annually review the functions and duties of the JTA and recommend any changes to the Chairperson for discussion and approval at the JTA Session.
3. Review and facilitate the implementation of action items from previous JTA sessions;
4. Annually review the tariff structure and recommend changes to the chairperson.
5. Analyze the JTA administrative costs to be reimbursed by the JTA, and make recommendations to the Chairperson.

#### Membership

1. The membership shall include:
  - i. Chairperson
  - ii. Vice-Chairperson
  - iii. Representative of the IOC Secretariat (ex officio)
  - iv. Representative of the WMO Secretariat (ex officio)
  - v. Three additional members proposed by the Chairperson and elected by the JTA. These members will serve for one term and may in principle be eligible only for one subsequent term.
  - vi. Representative of CLS Argos
2. Careful consideration should be made to ensure a proper mix that represents nations, user groups, and subject matter experts.
3. JTA members may attend the JTA-EC meetings as an observer, subject to the availability of adequate meeting room space. If required, the Chairperson of the JTA-EC will make a final decision as to which observers may attend, and may also invite other persons to attend at his / her discretion

Meetings

1. As necessary, the Chairperson will convene and organize all JTA-EC meetings. The meetings can be in person, or teleconference.
  2. If decisions are needed by the JTA-EC as permitted/requested by the JTA Session or the Chairperson during the intercession, elections for those decisions may be organized with a quorum consisting of at least four members of the JTA-EC, including the Chairperson or his nominated deputy.
-

**ANNEX XI-I**

**TYPICAL AGENDA FOR A JTA SESSION IN YEAR YYYY**

- 1. ORGANIZATION OF THE MEETING**
    - 1.1 OPENING OF THE MEETING
    - 1.2 ADOPTION OF THE AGENDA
    - 1.3 WORKING ARRANGEMENTS
    - 1.4 SELECTION OF THE WRITING GROUP (WG)<sup>11</sup>
  - 2. REPORT OF THE CHAIRPERSON OF THE JTA**
    - 2.1 OVERVIEW OF THE JTA
    - 2.2 REPORT ON THE EC
  - 3. THE ARGOS JTA STRATEGY FRAMEWORK**
  - 4. FEEDBACK FROM THE YYYY-1 AND YYYY NATION REPORTS**
  - 5. REPORT ON THE YYYY GLOBAL AGREEMENT**
  - 6. REPORT ON THE DEVELOPMENT AND OPERATIONS OF CLS**
  - 7. REVIEW OF USER'S REQUIREMENTS AND ISSUES**
  - 8. REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT & RELATED MATTERS**
    - 8.1 REVIEW OF THE GUIDING PRINCIPLES FOR NEGOTIATING THE TARIFF
    - 8.2 FIVE YEAR PLAN
  - 9. TERMS AND CONDITIONS OF THE YYYY+1 GLOBAL AGREEMENT**
  - 10. FUTURE PLANS AND PROGRAMMES**
    - 10.1 NATIONAL REPORTS
    - 10.2 OTHER PRESENTATIONS
  - 11. REVIEW OF THE OPERATING PRINCIPLES**
  - 12. REVIEW OF ACTIONS**
  - 13. ANY OTHER BUSINESS**
  - 14. ELECTIONS**
  - 15. DATE AND PLACE OF THE NEXT MEETING**
  - 16. CLOSURE OF THE MEETING**
- 

---

<sup>11</sup> : The purpose of the WG is to assist the Secretariats in taking the minutes and compiling a draft report of the proceedings for approval of the JTA.

**ANNEX XI-J**

TYPICAL JTA INTERSESSIONAL WORKPLAN AND REPORTING PROCESS

- JTA Session :                      0 Months      October
  - E-mail from the Secretariat informing ROCs about the achievements of the meeting (final report on the web)                      2 Months      December
  - Intersession #1                      3 Months      January
    - Email from Chairperson that outlines the work to be accomplished and assign actions to JTA-EC.
  - Intersession #2                      6 Months      April
    - Prepare documents and Chairperson for OPSCOM meeting in June
  - Intersession #3                      7 Months      May
    - Secretariat issues invitation letters
    - Agenda, and documentation plan for the next Session
  - Intersession #4                      9 Months      July
    - Status of actions assigned in Intersession #1. Make adjustments as necessary
    - Report from the OPSCOM Meeting
    - Chairperson communicating to the JTA on recent outcomes, and plans for the next Session
  - Intersession #5                      11 Months      September
    - Preparatory documents for the JTA Session made available to all participants
  - JTA Session:                      12 Months      October
-

## **ANNEX XI-K**

### FORMAT FOR THE NATIONAL REPORTS TO THE JTA

#### JTA National Report

Year:

Country:

#### Section 1. Overall Summary

The objective of this section is to provide a short narrative statement that characterizes a country's Argos participation, programme, and future directions. This section can also be looked at as an abstract of section 2 – section 6.

#### Section 2. Future Plans

Please provide information on national future plans.

#### Section 3. Technological Changes that affect User Requirements

This objective of this section is to provide information on any advances in instrument development, techniques, or other technology that may affect future development of the Argos system.

#### Section 4. User issues, problems, and level of satisfaction with Argos

The objective of this section is to highlight any user issues that need to be brought to the attention of the JTA and CLS Executives.

#### Section 5. Successful programme use of Argos

The objective of this section is to highlight the successful use of Argos in helping users achieve their objective.

#### Section 6. Analysis of Local Operational Issues

The objective of this section is to present any Argos issue that affects users in a particular location, country, or platform family that may not shared by other user groups.

## ANNEX XI-L

### TERMS OF REFERENCE OF THE TECHNICAL ADVISORY GROUP ON WILDLIFE ARGOS APPLICATIONS

*(Adopted by JTA-35)*

**The Technical Advisory Group on Wildlife Argos Applications** is a forum of wildlife user groups, which is providing an effective interface between users and CLS, and is bringing its experience with regard to activities related to use of Argos data for wildlife applications in order to address the issues below. The advisory group shall:

1. Identify issues and challenges related to Argos services, such as the cost of - Argos data, efficient use and management of the technology, data distribution, including real-time distribution and archiving;
2. Liaise with CLS in raising and resolving identified issues as appropriate;
3. Liaise with Argos equipment manufacturers in raising and resolving identified issues as appropriate;
4. Evaluate the impacts and benefits of new developments, such as investigating the enhancement of location precision;
5. Develop best practice guidelines for use of tracking technology in wildlife, including tagging methods, data collection and analyses;
6. Provide recommendations to the Argos JTA through the Executive Committee of the JTA; and
7. Provide a summary report to the JTA EC on the work done during the year, including plan of work for the coming year.

#### **Proposed Membership:**

The membership is open to all relevant Argos users. The JTA appoints the Chair of the Advisory Group, who will be tasked to decide on the full membership in liaison with the JTA Chair.

**ANNEX XI-M****ONGOING JTA ACTION ITEMS**

No.	Ref.	Action/decision item	By whom	Comment
1	JTA34/ 3.3	JTA Reports will include an annex of issues arising from national reports	JTA-EC, Secretariat	
2	JTA34/ 8.1.2	Evaluate and analyse the CLS charging algorithm and metrics.	CLS, JTA-EC	
3	JEC12/2.2.1	Requests DBCP chair to allow the JTA EC to report to the DBCP annual session	JTA Chair	
4	JTA35/2.3.4	to invite and inform the GOOS into the dialogue established between Animal telemetry and the IOOS (from IUCAWA)	JTA	
5	JTA35/11.4	to invite the national Argos users to consider including the Citation in peer reviewed journals, newspapers, web postings and/or social media interviews when describing their scientific work that used Argos satellite data telemetry	ROCs	The citation read as follows: <i>The Argos Data Collection and Location System was used to collect the scientific data for this work. A global satellite system dedicated to studying and protecting the environment, Argos is an international program that relies on instruments provided by the Centre National d'Etudes Spatiales (CNES) flown on polar-orbiting satellites operated by the National Oceanic and Atmospheric Administration (NOAA), the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) and the Indian Space Research Organization (ISRO).</i>



**ANNEX XII**

**NATIONAL REPORTS TO THE JTA**  
***(JTA National Report on Current and Planned Argos Use)***

The National Reports submitted by ROCs for Argos related national activities during the last intersessional period (2014-15) are now made available through JTA-35/Doc. 9, which can be downloaded from <http://www.jcomm.info/JTA-35>, or requested of the IOC or WMO secretariats.

National Reports are available from:

- Australia
  - China
  - Germany
  - India
  - The Netherlands
  - New Zealand
  - Sweden
  - Switzerland
  - United Arab Emirates
  - United States of America
-

**ANNEX XIII**

**LIST OF REPRESENTATIVES OF COUNTRY (ROCS) FOR THE ARGOS JTA**  
(October 2015)

**AUSTRALIA**

Holly Lourie  
Client Support  
CLS Aust-NZ-South Pacific  
Satellite IT Pty Ltd  
PO Box 42  
South Yarra  
Victoria 3141  
Australia  
Tel: +61 403 855 954  
E-mail: [holly@clsargos.com.au](mailto:holly@clsargos.com.au)

**BOTSWANA**

Kyle Good  
Programs Manager  
Cheetah Conservation Botswana,  
Mokolodi Nature Reserve,  
Private Bag 0457,  
Gaborone,  
BOTSWANA  
Telephone: +(267) 72356782  
Telefax: + (267) 3500613  
E-mail: [kmgood@accelerate-it.co.bw](mailto:kmgood@accelerate-it.co.bw)

**BRAZIL**

Mr Wilson Yamaguti  
Instituto Nacional de Pesquisas Espaciais  
(INPE)  
Av. dos Astronautas, 1758  
12227-010 SAO JOSE DOS CAMPOS  
Brazil  
Telephone: +55-12 3322 9977  
Telefax: +55-12 3321 8743  
E-mail: [yamaguti@dss.inpe.br](mailto:yamaguti@dss.inpe.br)

**CANADA**

Mr Keith Lennon  
[To be confirmed]  
Fisheries and Oceans Canada  
9860 West Saanich Road  
SIDNEY, BC V8L 4B2  
Canada  
E-mail: [Keith.Lennon@dfo-mpo.gc.ca](mailto:Keith.Lennon@dfo-mpo.gc.ca)

**CHILE**

Mr Christian Bull  
[To be confirmed]  
Cunlogan SA  
E-mail: [bull@cunlogan.cl](mailto:bull@cunlogan.cl)

**CHINA**

Yu Ting  
[To be confirmed]  
National Marine Data and Information  
Service  
93 Liuwei Road.  
Hedong District  
Tianji, 300171  
P.R. China  
Telephone: +86-22 24010 859  
E-mail: [julia\\_yu\\_nmdis@163.com](mailto:julia_yu_nmdis@163.com)

**DENMARK**

Mr Claus Nehring  
Danish Meteorological Institute  
100 Lyngbyveg  
DK-2100 COPENHAGEN 0  
Denmark  
Telephone: +45 3915 7500  
Telefax: +45 3927 1080  
E-mail: [cn@dmi.dk](mailto:cn@dmi.dk)

**FINLAND**

Milla Johansson  
Finnish Meteorological Institute  
Erik Palménin aukio 1  
PO Box 503  
FI-00101 Helsinki  
Finland  
Telephone: +358 9 1929 6425  
Telefax: + 356 9 3231 025  
E-mail: Milla.Johansson@fmi.fi

**GERMANY**

Dr Birgit Klein  
Bundesamt fuer Seeschifffahrt und  
Hydrographie (BSH)  
Bernhard-Nocht-Strasse 78  
D-20359 Hamburg  
Telefax: 0049-40-3190-5000  
E-mail: birgit.klein@bsh.de

**ICELAND**

Mr  
Magnus Jonsson  
Icelandic Meteorological Office  
Vedurstofa Islands  
Bustadavegur 9  
150 REYKJAVIK  
Iceland  
Telephone: +354 560 0600  
Telefax: +354 552 8121  
E-mail: office@vedur.is

**INDIA**

Dr K. Radhakrishnan  
Director  
INDIAN NATIONAL CENTRE FOR  
OCEAN  
INFORMATION SERVICES (INCOIS)  
Plot No 3, Nandagari Hills Layout  
Jubilee Hills  
HYDERABAD 500 033  
India  
Telephone: +91-40 355 3542/43  
Telefax: +91-40 355 1096  
E-mail: director@incois.gov.in

**ISRAEL**

Yossi Leshem  
Faculty of Lye Sciences  
69978 TEL AVIV  
Israel  
E-Mail : yleshem@post.tau.ac.il

**ITALY**

Mr Stephano Fioravanti Ph.D  
NATO Saclant Undersea Research Centre  
Viale San Bartolomeo 400  
19138 LA SPEZIA  
Italy  
Telephone: +39 1875271  
Telefax: +39 187524600  
E-mail: steve@saclantc.nato.int

**NEW ZEALAND**

Mr Ross BANNISTER  
Network Operations –  
Port Meteorological Officer  
Meteorological Service of New Zealand  
Limited  
30 Salamanca Road,  
Kelburn,  
PO Box 722  
Wellington 6140  
New Zealand  
Tel: +64 4 4700 789  
Fax: +64 4 4735 231  
Email: Ross.Bannister@metservice.com

**NORWAY**

Mr Anton Eliassen  
Norwegian Meteorological Institute  
Attn: Lilian Swenden  
P.O. Box 43, Blindern  
N-0313 OSLO 3  
Norway  
Telephone: +47-22 963000  
Telefax: +47-22 963050  
E-mail: met.inst@met.no

**REPUBLIC OF KOREA**

Jang-Won Seo  
Senior Research Scientist  
National Institute of Met. Research, KMA  
45 Gisangcheong-gil  
Dongjak-gu  
Seoul 156 720  
Republic of Korea  
Tel: +82 2 841 2786  
Fax: +82 2 841 2787  
E-mail: jwseo@kma.go.kr

**RUSSIAN FEDERATION**

Dr Viatcheslav V. Rozhnov  
Head of the Laboratory of Behaviour and  
Behavioural Ecology of Mammals  
Deputy-Director  
A.N. Severtsov Institute of Ecology and  
Evolution  
Russian Academy of Sciences  
33, Leninsky prospect  
119071 Moscow  
Russian Federation  
Tel: (+7) 495 952 73 05  
Telefax: (+7) 495 954 55 34  
E-mail: rozhnov.v@gmail.com

**SOUTH AFRICA**

Mr Johan Stander  
P O Box 21, Cape Town International  
Airport, 7525 South Africam  
Cape Town  
7525  
Western Cape  
South Africa  
Telephone: + 27 (0)21 935 5700  
Telefax: +27 (0) 21 934 4590  
E-mail:  
Johan.Stander@weathersa.co.za

**SPAIN**

Ms Ana Bermejo  
Centro de Migración de Aves  
Área de Estudio y Seguimiento de Aves  
C/ Melquiades Biencinto, 34  
28053 MADRID  
Spain  
Telephone: +34-91 434 0910  
Telefax: +34-91 434 0911  
E-mail: abermejo@seo.org

**SWEDEN**

Mr Ilmar Karro  
Swedish Meteorological and Hydrological  
Institute (SMHI)  
Folkborgsvägen 1  
S-601 76 NORRKOPING  
Sweden  
Telephone: +46-11 158000  
Telefax: +46-11 170207  
E-mail: ilmar.karro@smhi.se

**SWITZERLAND**

Dr Adrian Aebischer  
Museum of Natural History  
Chemin du Musee 6  
CH-1700 Fribourg  
Switzerland  
Tel: +41 26 300 9040  
Fax: +41 26 300 9760  
E-mail: adaebischer@pwnet.ch

**TANZANIA**

Neil Baker  
Tanzania Bird Atlas Project  
TANZANIA  
E-mail: tzbirdatlas@yahoo.co.uk

**THAILAND**

Dr Wattana KANBUA  
Director of Marine Meteorological Center  
Marine Meteorological Center, Thai  
Meteorological Department  
4353 Sukhumvit Road, Bangna  
Bangkok 10260  
Thailand  
Tel: +66 2 3994561  
Fax: +66 2 3669375  
Email: watt\_kan@hotmail.com

**THE NETHERLANDS**

Mr Hans Roozkrans  
Co-ordinator International Relations  
International Relations  
Royal Netherlands Meteorological Institute  
(KNMI)  
Ministry of Infrastructure and Environment  
PO BOX 201  
3730 AE De Bilt  
The Netherlands  
Tel: +31 30 2206421  
Fax: +31 30 2211371  
Mobile: +31 6 52062552  
E-mail: [Hans.Roozkrans@knmi.nl](mailto:Hans.Roozkrans@knmi.nl)

**UNITED ARAB EMIRATES**

Mr Sálím Javed  
Manager, Terrestrial Assesment &  
Monitoring  
Biodiversity Management Sector  
Environment Agency - Abu Dhabi  
PO Box 45553, Abu Dhabi, United Arab  
Emirates.  
Phone: +971-2- 681 7171  
Phone: +971-2-6934711 (direct)  
Fax: +971-2-4997282  
E-mail: [sjaved@ead.ae](mailto:sjaved@ead.ae)

**USA**

Mr Eric Locklear  
Climate Program Office  
NOAA  
1100 Wayne Avenue Suite 1210  
Silver Spring, MD 20910  
USA  
Telephone: +1 301 427 2361  
Telefax: +1 301 427 2222  
E-mail: [eric.locklear@noaa.gov](mailto:eric.locklear@noaa.gov)

**OTHER**

Dr I-Jiunn Cheng  
National Taiwan Ocean University  
Institute of Marine Biology  
No. 2 Pei-Ning Road  
202 KEELUNG  
Taiwan  
Telephone: +886-2 2462 2192-5303  
Telefax: +886-2 2462 8974  
E-mail: [b0107@mail.ntou.edu.tw](mailto:b0107@mail.ntou.edu.tw)

## ANNEX XIV

## ARGOS JOINT TARIFF AGREEMENT (JTA) EXECUTIVE COMMITTEE BUDGET

Argos Joint Tariff Agreement (JTA) budget within DBCP Trust Fund (as of 1 Oct. 2014, estimates in blue)											
Year	Item	Income & Expenditure		1 CHF	Income & Expenditure		Income & Expenditure for JTA	JTA balance	Income & expenditure for WMO	WMO balance	Comment
		CHF	USD		USD	USD	USD	USD	USD	USD	
<b>2010</b>	<b>Initial JTA balance</b>						0			0	
	CLS Contribution to DBCP TF at WMO (2010)				55,000	45,000	45,000	10,000	10,000		
	Mission, J. Stander, JTA-EC, Sydney, 04/2010				-4,273	-4,273	40,727	0	10,000		
	Mission, E. Charpentier, JTA-EC, Sydney, 04/2010				-3,321	-3,321	37,406	0	10,000		
	Mission, J. Stander, JTA-30, Oban, 10/2010				-2,402	-2,402	35,004	0	10,000		
	Mission, Greg Reed, IPET-DMI, 4/2010				-1,823	0	35,004	-1,823	8,177		
	Frank Grooters JTA contract (SSA), 10/2010				-15,437	-15,437	19,567	0	8,177		
<b>2011</b>	<b>CLS Contribution to DBCP TF at WMO (2011)</b>				<b>35,269</b>	<b>25,269</b>	<b>44,836</b>	<b>10,000</b>	<b>18,177</b>		
	Mission, J. Stander, JTA-EC, Miami, 4/2011				-1,224	-1,224	43,612	0	18,177		
	Mission, D. Meldrum, RMIC2, Tianjin, 7/2011				-3,247	0	43,612	-3,247	14,930		
	Mission, S. Issara, RMIC2, Tianjin, 7/2011				-3,829	0	43,612	-3,829	11,101		
	Mission J. Trinanes, IPET/DRC, Melbourne, 9/2011				-1,638	0	43,612	-1,638	9,463		
	Mission ROC Botswana, JTA-31, Geneva, 9/2011				-4,051	-4,051	39,561	0	9,463		
	Mission J. Stander, JTA-31, Geneva, 9/2011				-3,781	-3,781	35,780	0	9,463		
	Frank Grooters JTA contract (SSA), 10/2011				-15,000	-15,000	20,780	0	9,463		
	Mission, E. Charpentier, Toulouse, 12/2011				-2,178	0	20,780	-2,178	7,285		
<b>2012</b>	<b>CLS Contribution to DBCP TF at WMO (2012)</b>				<b>34,028</b>	<b>24,028</b>	<b>44,808</b>	<b>10,000</b>	<b>17,285</b>		
	Mission J. Stander, JTA-EC, Toulouse, 4/2012				-3,080	-3,080	41,728	0	17,285		
	Mission E. Charpentier, JTA-EC, Toulouse, 4/2012	-2216	1.06045		-2,350	-1,175	40,553	-1,175	16,110		50% JTA support (Satcom - JTA-EC)
	Mission J. Stander, JTA-32, Fremantle, 10/2012	-3113	1.06045		-3,301	-3,301	37,252	0	16,110		
	Frank Grooters JTA contract (SSA), 10/2012				-15,000	-15,000	22,252	0	16,110		
<b>2013</b>	<b>CLS Contribution to DBCP TF at WMO (2013)</b>				<b>32,748</b>	<b>22,748</b>	<b>45,000</b>	<b>10,000</b>	<b>26,110</b>		
	IODE-22 (S. Woodruff, G. Rosenhagen)				-2,357	0	45,000	-2,357	23,753		
	JTA-EC 2013, Annapolis (J. Stander, T. Gross)				-2,379	0	45,000	-2,379	21,374		
	RMIC workshop for RA-I, Casablanca, 2013				-5,781	0	45,000	-5,781	15,592		
	Frank Grooters JTA contract (SSA), 10/2013				-15,000	-15,000	30,000	0	15,592		
	Satcom forum				-4,046	0	30,000	-4,046	11,546		
	JTA-33 (J. Stander, J. Linguanti)				-7,587	-7,587	22,413	0	11,546		
<b>2014</b>	<b>CLS Contribution to DBCP TF at WMO (2014)</b>				<b>28,342</b>	<b>18,342</b>	<b>40,755</b>	<b>10,000</b>	<b>21,546</b>		Invoice FIN13-352 (12/11/2013)
	JTA-EC-10, Hamburg, 6-8 May 2014				-10,108	-10,108	30,647	0	21,546		
	CLIMAR-4, Asheville, 9-12 June 2014				-4,236	0	30,647	-4,236	17,310		
	ETDMP-4, Ostend, 23-26 June 2014				-2,878	0	30,647	-2,878	14,432		
	JTA-34, Tianjin, 3-5 Nov. 2014				0	0	30,647	0	14,432		
<b>2015</b>	<b>CLS Contribution to DBCP TF at WMO (2015)</b>				<b>25,578</b>	<b>15,578</b>	<b>46,225</b>	<b>10,000</b>	<b>24,432</b>		
	PMO-5, Valparaiso, Chile, Jul. 2015 (trainees)		1.03		-5,000	0	46,225	-5,000	19,432		
	ETMC-5 (Woodruff, Sato)				-5,261	0	46,225	-5,261	14,171		
	JTA-EC-12 (Javed, Stander)				-3,886	-3,886	42,339	0	14,171		
	JTA-35 (Locklear, Stander, Javed)				-15,000	-15,000	27,339	0	14,171		
	OPSCOM-49 (Locklear)				-1,886	-1,886	25,453	0	14,171		
<b>2016</b>	<b>CLS Contribution to DBCP TF at WMO (2016)</b>				<b>29,547</b>	<b>19,547</b>	<b>45,000</b>	<b>10,000</b>	<b>24,171</b>		
	RMIC/RA-IV				-10,000	0	46,225	-10,000	14,171		
	Satcom1				-5,000	0	46,225	-5,000	9,171		

## ANNEX XV

### FEEDBACK FROM THE 2014 JTA NATIONAL REPORTS, AND CLS RESPONSE

#### Issues mentioned in the Canadian Report

**Comment:** *“Satisfied with current service, but bandwidth continues to be a limitation”* from the DFO Marine Mammal Program of Dalhousie University (#788)

**Response:** We understand by “bandwidth” the Argos uplink data rate transfer. An Argos3/4 chipset named ARTIC (Argos Transceiver Integrated Chipset) will be finalized this year. This transmitter – receiver of 7mm by 7 mm will allow the Argos-3 and 4 technologies in miniaturized Argos beacons like wildlife tags. Thanks to the satellite pass predictions and the transmission of acknowledgments by the downlink way, all Argos applications like marine mammals tracking will benefit of better transmission efficiency.

**Comment:** *“We have cancelled our ArgosDirect service because it proved to be very expensive (ranging between 10 to 50% of Argos monthly cost). We are now only requesting monthly Databank CD. The issue with this service is that the Databank CD takes 3 weeks to receive. As much we like having hard Copy (CD) of the data sent to us, we would prefer accessing the monthly data through a dedicated website (e.g., Argos website/Data access). This would prove a better value than the 3 weeks delay to receive the Databank CD.”* from the DFO Arctic Whales and Sharks Program (#1142)

**Response:** The customer databank has been changed to email delivery, and they seem to be very happy that they will receive their monthly data on the 1<sup>st</sup> of the following month.

In order to reduce ArgosDirect costs for the Argos wildlife users, CLS will introduce in 2016 a new pricing structure for this service with a monthly flat fee per Argos ID.

**Comment:** *“It will be much better if all the previously collected data longer than 20 days for a platform can be accessed online.”* from the ENR Caribou Tracking Programs (#1572, #10572).

**Response:** A one year on-line data extraction from the archive database is available via ArgosWeb. (Menu Data Access – Access to Archived Data)

**Comment:** *“For species that don't frequently come to the surface, like the blue whale, it would be nice to be able to provide the deployment location for each of the PTT, so that the algorithm starts with a plausible position at a given date and time.”* from the DFO Marine Mammal Program of Dalhousie University (#788).

**Response:** The initial location of deployment can be setup directly by the user via ArgosWeb (Menu Settings – Platforms – Platform Characteristics).

**Comment:** *“We have been very satisfied with services provided by Argos. However, we note the lack of two-way communications with conventional Argos and limited data throughput.”* from the DFO Argo Profiling Floats Program (#2442).

**Response:** The two-way communication and better transmission efficiency are available with the Argos-3 technology. Ifremer from France has already integrated this technology into Argo profiling floats.

**Comment:** *“Issue regarding Argos web access. An enhanced web access, for files download (superior number of lines per files) and to have more than the last 10 days of data would be much appreciated.”* from the Quebec University Arctic and Red Fox Tracking Program (#3297).

**Response:** A new ArgosWeb access with enhanced performances in term of data download will be available early 2016. And today, already the last 20 days of data are available through ArgosWeb.

**Comment:** *“It would be good if CLS could email regular updates on the number of PTTs transmitting per program, rather than the PI having to request that information.”* from the Environment Canada Sea Duck and Arctic Goose Tracking Program (#30375).

**Response:** The number of monthly PTTs transmitting per program is available online through ArgosWeb in the menu Account Activity.

### Issues mentioned in the Chinese Report

**Comment:** *“Due to limitation of field operation and the harsh environment, a lot of biologists like us could not always download the data in time. We hope the ArgosWeb to prolong the time for online data access.”* from the East China Sea Fisheries Research Institute.

**Response:** A one year on-line data extraction from the archive database is available via ArgosWeb. (Menu Data Access – Access to Archived Data)

**Comment:** *“We hope to get access to the technical materials about the new Argos system with two-way communication mode, so as to help our application. We also hope that CLS organizes Argos system technical training to help more users to better understand the system and therefore to facilitate the daily usage.”* from the East China Sea Fisheries Research Institute.

**Response:** Every year CLS in collaboration with CLS China is organizing several Argos user workshops in China to meet users and answer their technical questions.

### Issues mentioned in the German Report

**Comment:** *“The bird trackers in general mentioned higher accuracy needs in locations and needs for smaller and lighter transmitters.”* from the German ROC.

**Response:** Improvements on the Argos Doppler calculation (Kalman Filtering method) will be done end of 2015 and early 2016: computation of the first Argos location with less than 4 collected messages and a new Argos Loc quality monitoring component. Smaller and lighter bird transmitters have been certified by CLS in 2015 (until 2gr).

**Comment:** *“Program 8919 has mentioned the wish for two-way communication for the mooring watch dogs to be able to change the communication parameters in case that recovery after unexpected surfacing is delayed.”* from the German ROC.

**Response:** CLS will continue to lobby actively the use of the Argos-3 technology to the watch dog beacons manufacturers (Sercel, Xeos, Metocean, SiS...).

### Issues mentioned in the Indian Report

**Comment:** *“Though Argos could cater many useful services with low cost, bandwidth need to be increased. Also, more number satellites are required for the low latitude regions for better repeatability.”* from the Indian ROC.

**Response:** We understand by “bandwidth” the Argos uplink data rate transfer. CLS encourages Argos users to benefit from the Argos-3 technology with better transmission efficiency. CLS in cooperation with CNES is currently working on new satellite opportunities to launch more Argos space instruments.

### Issues mentioned in the New Zealand Report

**Comment:** *“One user mentioned that working with animals that are difficult to find and tag the unused PTT charges can become a bit of a financial burden.”*

**Response:** CLS recalls that Unused PTT charges could be avoided by releasing Argos ID numbers before 2 years of inactivity (no transmission) in the user Argos program.



## Issues mentioned in the Spanish Report

**Comment:** “...the bird trackers in general mentioned higher accuracy needs in locations and needs for smaller and lighter transmitters.” from the Spanish ROC.

**Response:** Improvements on the Argos Doppler calculation (Kalman Filtering method) will be done end of 2015 and early 2016: computation of the first Argos location with less than 4 collected messages and a new Argos Loc quality monitoring component. Smaller and lighter bird transmitters have been certified by CLS in 2015 (until 2gr).

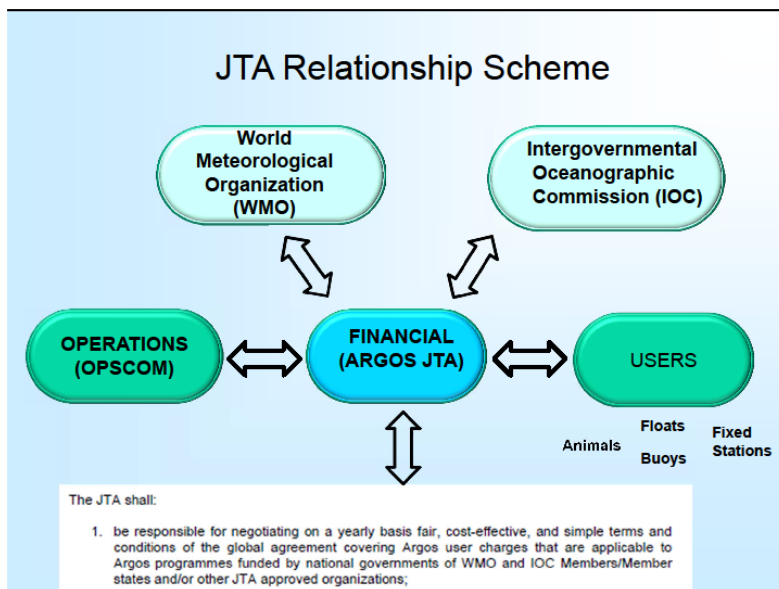
---

**Annex XVI**

**OVERVIEW OF THE JTA**

*(submitted by the JTA Chair, Eric Locklear, USA)*

1 The Chairperson of the JTA, Mr Eric Locklear, presented a report on his activities in support of the participants in the JTA since the previous Meeting (JTA-34, Weihai, China, November 3 – 5, 2013). The chair reiterated the overview of the origins of the JTA which he delivered to the Argos JTA-Executive Committee (JTA-EC) Meeting in Silver Spring, MD in 2015; and the Argos Operations Committee (OPSCOM) 49<sup>th</sup> Meeting in St. Emilion, France in June, 2015. The chair explored how the OPSCOM and JTA relate by demonstrating that Argos JTA is influenced by the users. The OPSCOM is not set up to work directly with the user groups, while the JTA is able to audit and describe the user groups and the current status of their participation in the Argos JTA programme.



To expand on this further, the families of Argos users are represented by ROCs (Representatives of Country), RUGs (Representatives of User Groups), and ROs (Representatives of Organizations). It is now more important than ever that the JTA encourage Representatives to attend the annual JTA meetings because of the changing nature of the user groups. The “Wildlife” has grown to be the largest user group within the JTA

2 An overview of the Argos Joint Tariff Agreement (Argos JTA) was published in Annex XI of the Argos JTA 26<sup>th</sup> Meeting, La Jolla, CA Final Report<sup>12</sup>. In short, the Argos System emerged from a long-standing partnership of environmental research between the National Oceanographic and Atmospheric Administration (NOAA) of the United States of America and the and the French Space Agency (CNES, Centre National d'Etudes Spatiales). The objective of the Argos system was to provide for the global location, acquisition, and dissemination of environmental data. Argos would not only improve and expand the global operational weather system, but also support ocean, weather, and other environmental research.

3 First signed in 1974 then again in 1986, a Memorandum of Understanding (MOU) between the NOAA and CNES set forth their respective roles and responsibilities for operating the Argos System. NOAA would be responsible for the procurement, launch, and operation of the satellites, and CNES would be responsible for instrument development, operate the data processing system, and serve at the intersection of Argos Data Collection System Management, monitoring and operations. They had a joint objective of promoting the maximum use of the system through enhanced services and cost-effective operations with the goal of achieving a self-sustaining system with revenues from users fully offsetting operating costs. Obviously the end-2-end costs of the Argos System are not being collected by the users, and the JTA tariffs that are collected are used to offset the operating costs of data processing for the JTA users. These MOUs

<sup>12</sup> The format of the report was decided at the 28th Meeting (2008) and noted in the JTA Operating Principles. As in the case of previous meetings, the report will be available online via the JCOMM website.

have been modified over the years as necessary to meet changing user requirements as well as the needs of NOAA and CNES.

4 An important outcome of these MOU's was also the establishment of an Operations Committee (OPSCOM) with 3 objectives. The OPSCOM was initially made up of NOAA and CNES, but now includes the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and the Indian Space Research Organization (ISRO). The OPSCOM exists to review and manage the development and operation of the Argos System, the OPSCOM reviews and approves applications for the use of the system, and the tariff structure adopted by the Argos JTA.

5 It wasn't until 1981 that the first Argos JTA meeting was convened, by the WMO, to make available the Argos system to all interested nations for weather prediction and environmental research. The JTA was born. Additional information on the history of the JTA can be found in Annex XI of the Argos JTA-26 Final Report.

---

**ANNEX XVII**

**Argos JOINT TARIFF AGREEMENT (JTA) VISION AND MISSION**

**VISION**

To provide a fair and affordable mechanism to monitor the environment.

**MISSION**

To ensure the sustainability of Argos, a global data collection and localization satellite system dedicated to studying and protecting the environment.

***What does the JTA do?***

Transparently negotiate the Argos tariffs for data collection, location, and processing for the environmental observation community; and influence the technological evolution of the Argos system to meet User needs

***How does the JTA do it?***

Provides a collaborative global forum between nations, user groups, and CLS within the WMO & IOC framework; and through a participative governance structure in accordance with the JTA Terms of Reference.

---

**LIST OF ACRONYMS AND OTHER ABBREVIATIONS**

AHRPT	Advanced High Rate Picture Transmission
Argo	International profiling float programme (not an acronym)
ASAP	As soon as possible
BOM	Bureau of Meteorology (Australia)
BUFR	Binary Universal Form for Representation of Meteorological Data
CBS	WMO Commission for Basic Systems
CLS	Collecte Localisation Satellites
CLSA	Collecte Localisation Satellites America
CNES	Centre National d'Etudes spatiales (France)
DBCP	Data Buoy Cooperation Panel (WMO-IOC)
DCS	Data Collection System
EC-PHORS	WMO Executive Council Panel of Experts on Polar and High Mountain Observations, Research and Services
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
FTP	File Transfer Protocol
FYP	Five-Year Plan (of JTA)
GDP	Global Drifter Programme
GOOS	Global Ocean Observing System (IOC, WMO, UNEP, ICSU)
GTS	Global Telecommunication System (WMO)
HRPT	High Rate Picture Transmission
ID	Platform Identification Number
IOC	Intergovernmental Oceanographic Commission of UNESCO
IOOS	Integrated Ocean Observing System (USA)
ISRO	Indian Space Research Organization
IUCAWA	International User Conference on Argos Wildlife Applications
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
JTA	Argos Joint Tariff Agreement
JTA-EC	JTA Executive Committee
LAC	Local Area Coverage
LDR	Low Data Rate
LUS	Limited Use Service (Argos)
LUT	Local User Terminal (Argos)
METOP	Meteorological Operational satellites of the EUMETSAT Polar System (EPS)
MOU	Memorandum Of Understanding
NESDIS	NOAA Satellites and Information Service
NOAA	National Oceanographic and Atmospheric Administration (USA)
NWP	Numerical Weather Prediction
OPSCOM	Argos Operations Committee (NOAA, CNES, EUMETSAT, ISRO)
PMT	Platform Messaging Transceivers
PTT	Platform Transmitter Terminal
PTT-year	Equivalent to a PTT reporting in every time-slot during one year
RO	Responsible Organization representing an agreed set of Argos User programmes (JTA)
ROC	Representative of Country representing a country or a group of countries participating in the JTA
RUG	Representative of a User Group
Satcom	International Forum of Users of Satellite Data Telecommunication Systems
Satcom	Satellite data telecommunication
SHARC	Satellite High-performance ARGOS-3/-4 Receive/transmit Communication
SLA	Service Level Agreement
STIP	Stored TIROS Information Processing
SUA	Argos System Use Agreement
TAGW	Technical Advisory Group on Wildlife Argos Applications
UAE	United Arab Emirates

JTA-35 record of decisions, Acronyms

UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
US	United States (of America)
USD	US Dollar
WMO	World Meteorological Organization

---

*[this page left blank intentionally]*