

INTERGOVERNMENTAL OCEANOGRAPHIC  
COMMISSION (OF UNESCO)

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WORLD METEOROLOGICAL ORGANIZATION

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**ARGOS JOINT TARIFF AGREEMENT**  
**TWENTY-NINTH MEETING**

Paris, France, 2-3 October 2009

**FINAL REPORT**

## **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).

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## REPORT OF THE MEETING

### 1. INTRODUCTION

1.1 For more quarter of a century, the Joint Tariff Agreement (JTA) scheme has served as a robust example of international cooperation that is managed at the working level. It continues to provide an effective, self-governing global forum through which users' needs and requirements are presented, reviewed, and carried forward as an influential part of a wider decision-making process.

1.2 As for the final report of the previous JTA Session, the following format is proposed for this year's meeting report<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 decision on next meeting;
- Annexes containing all necessary information

### 2 STATUS OF ACTIONS FROM THE PREVIOUS MEETING, AND PENDING ACTIONS FROM PREVIOUS MEETINGS

#### 2.1 Status of actions from the previous meeting

No.	Action item (2.1)	By whom	Deadline	Status
1	To report on the progress of Argos-3 Pilot Project	CLS	JTA-XXIX (Oct. 2009)	Done <sup>1</sup>
2	To send a Joint WMO-IOC letter to OPSCOM to address data delay issues, including NESDIS' efforts for blind orbit data being collected by the NPOES antenna in Svalbard	Secretariat / DBCP and JTA chairs	ASAP	Done
3	To pursue negotiations for the installation of new antennas to cover the South Atlantic and the Indian Ocean regions	CLS / SAWS	ASAP (to report to JTA-XXIX)	Ongoing <sup>1</sup>
4	To enhance Hyderabad LUT station performance	INCOIS / CLS	Nov. 2008	Ongoing <sup>1</sup>
5	To ensure data from NOAA-15, 16, 17, and 18 are being received by IRD and Météo France stations in La Réunion Island	IRD-Météo France - CLS	ASAP	Ongoing <sup>1</sup>
6	1) Investigate existing antennas in the Indian Ocean area and 2) try to connect them to the Argos network	CLS	1) Dec. 2008 2) ASAP in 2009	Ongoing <sup>1</sup>
7	Study other possibilities to add new antennas in Indian Ocean (Ideally in central Indian Ocean)	CLS	2009	Ongoing <sup>1</sup>
8	To continue efforts for making the Brazilian Satellites data available via the new Argos data processing system	CLS	ASAP	Ongoing <sup>1</sup>
9	To circulate the CLS Financial information – as presented by CLS during the Meeting – at least 3 weeks prior to the JTA meeting (via ROC mailing list)	CLS	15 days before JTA-XXIX (Oct. 2009)	Done <sup>2</sup>

<sup>1</sup> : The format of the report is to be reviewed and decided upon at the regular meetings. As in the case of previous meetings, the report will be available online via the JCOMM website.

No.	Action item (2.1)	By whom	Deadline	Status
10	To inform ROCs on new tariff scheme for unused IDs, with the list of unused IDs for each country.	CLS	9 Nov. 2008	Done <sup>2</sup>
11	[5-Year Plan] To issue a questionnaire (to their users to collect information on future usage of the Argos system), and a list of users to the ROCS for distribution	CLS	15 Mar. 2009	Done
12	[5-Year Plan] To answer to the CLS questionnaire on foreseen usage for their country or area of responsibility, in terms of type of activity (animals, buoys, drifters, ...) and yearly evolution	ROCs	1 June 2009	Done <sup>2</sup>
13	[5-Year Plan] To circulate a preliminary five year plan for review by the ROCs	CLS	1 Sep. 2009	Done <sup>2</sup>
14	To review the "role of ROCs" document and update as necessary	Jrev	to report to JTA-XXIX	Done <sup>3</sup>
15	To explore possible support mechanism for ROCs to attend JTA Meetings	Chair, Jrev, CLS	ASAP (to report to JTA-XXIX)	Done <sup>3</sup>
16	To collect WMO and IOC governing bodies' decision regarding the JTA and make them available to the ROCs	Secretariat	ASAP	Done <sup>3</sup>
17	To provide financial estimation for the Joint Secretariat support to the JTA	Secretariat	ASAP	Done <sup>3</sup>
18	To discuss on a possible arrangement for funding to cover the cost of the Joint Secretariat's support for JTA activities	JTA and CLS	To be reported at JTA-XXIX (Oct. 2009)	Done <sup>3</sup>
19	To continue with the current arrangements for the independent Chairperson, and JTA to provide a limited funding for covering DBCP Members having activities on behalf of the JTA. CLS to contribute to the DBCP Trust Fund (total USD 15,000)	CLS	Early 2009	Done <sup>3</sup>
20	To communicate with OPSCOM on incorporating various users' requirements, including the animal trackers	ROCs	ASAP and ongoing	Ongoing <sup>2</sup>
21	To communicate with various users to incorporate their requirements in the regular meeting	ROCs	JTA-XXIX (Oct. 2009)	Ongoing <sup>2</sup>
22	To circulate a note (via email) to ROCs and major participants, on 1) purpose of the regular meeting, 2) list of issues, and 3) outcome to be sought in the meeting.	Chair	Before JTA-XXIX (Oct. 2009)	Done <sup>5</sup>
23	To provide a brief summary of the OPSCOM	Chair	After regular OPSCOM meeting	Done <sup>5</sup>
24	To organize an open, informal pre-discussion meeting	Chair, Vice-chair	1 day before JTA-XXIX (Oct.2009)	Done <sup>3,5</sup>
25	CLS to provide updated ROC list to Secretariat	CLS	ASAP and ongoing	Done <sup>4</sup>

## 2.2 Pending actions from previous meetings

No	Action item (2.2)	By whom	Deadline	Status
3	Users who need downlink capability to start using the demonstration PMTs as soon as they become available	Users	JTA-XXVIII (Oct. 2008)	Ongoing <sup>1</sup>
4	To promote the PMT pilot activity at the national level	ROCs	JTA-XXVIII (Oct. 2008)	Ongoing <sup>1</sup>
6	To install new antennas according to the following priority areas: the South Atlantic, the Indian Ocean, and the Southwest Pacific Ocean.	CLS	JTA-XXVIII (Oct. 2008)	Ongoing <sup>1</sup>
7	To offer solutions for improving data timeliness and to develop data timeliness monitoring tools	CLS	JTA-XXVIII (Oct. 2008)	Ongoing <sup>1</sup>
15	To make the Brazilian Satellites data available via the new Argos data processing system.	CLS	ASAP	Ongoing <sup>1</sup>

Notes:

- (1) See Annex V – 2008-2009 System Improvement
- (2) See Annex VI - Review of the structure of the Tariff Agreement and related matters
- (3) See final report of the informal pre-JTA meeting, Paris, 2-3 July 2009 (JTA-29 Doc. No. 10)
- (4) See Annex XI – List of Representatives of Country (ROCs) for Argos
- (5) See JTA chair report for the meeting (JTA-29 Doc. No. 2)

## 3 ACTIONS AND DECISIONS OF THE CURRENT MEETING

No.	Ref.	Action item (3.)	By whom	Deadline
1	3.3	Implement strategy for the improvement of data timeliness	CLS	2012
2	3.4.8	Produce a thorough analysis, and rationale on an unused ID monthly fee or a monthly ID charge, and submit it to the EC	CLS	15 Mar 2010
3	3.4.8	EC to work with CLS on possible alternative options and to come up with a solution to be approved at the next JTA meeting	EC & CLS	JTA-XXX
4	3.4.9	Provide information, and solicit ROCs to return unused IDs	CLS	JTA-XXX
5	3.5.11	Argos developments and the status/evolution of Argos use in their countries	CLS	ongoing
6	3.5.11	Develop guiding principles regarding the tariff structure for negotiating the tariff	EC	JTA-XXX
7	3.5.14	Analyze the JTA administrative costs to be reimbursed by the JTA, and make recommendations to the Chairperson who will make the final decision	EC	End 2009
8	3.5.10	Review the text of the operating principles to ensure consistency and check the language	Ken Jarrott	End 2009
9	3.5.15	CLS to contribute to the DBCP Trust Fund for the contract of the independent Chairperson	CLS	Jul 2010

### **3.1 Review 2009 Global Agreement**

3.1.1 Detailed information on the 2009 Global Agreement is given in Annex III.

### **3.2 Technical Development**

3.2.1 The full reports on 2008-2009 operations, on system improvements and development projects are attached as Annex IV and Annex V, respectively.

#### ARGOS-3 PILOT PROJECT

3.2.2 The 24<sup>th</sup> DBCP Session (13-16 October 2008, Cape Town, South Africa) decided to establish an Argos-3 Pilot Project and formed a community-wide Steering Group (see Terms of Reference in the final report of the DBCP Session). The Pilot Project is planning to deploy 50 drifters equipped with Argos 2-way PMTs with financial assistance from CLS (i.e. 25 SVPs and 25 SVPBs). Participants in the Pilot Project support the Argos service charges. The aim is to test and hopefully build confidence in, as well as promote the Argos-3 technology.

3.2.3 As decided at the OPSCOM-42 and OPSCOM-43, the Argos-3 pricing should be defined based on experience gained from the DBCP Pilot Project regarding actual usage.

3.2.4 The 25<sup>th</sup> DBCP Session (28 September – 1 October 2009, Paris, France) noted that at the present, 18 Argos-3 drifters have been deployed in the Mediterranean Sea, North and South Atlantic Ocean, Pacific Ocean. More drifters are planned for deployment in those and other regions. Some preliminary evaluation of the ARGOS 3 buoys was performed by CLS. During the first Argos 3 Pilot Project steering team meeting, a list of evaluation criteria was defined. It was also decided that both manufacturers and users should be involved in the evaluation process.

### **3.3 Review Users' Requirements**

3.3.1 The 25<sup>th</sup> DBCP Session expressed the following specific recommendation to the JTA:

- Concerns continue to be expressed regarding data timeliness especially in certain regions such as the South Atlantic Ocean, the Indian Ocean, and the South Pacific Ocean.

3.3.2 The meeting noted with appreciation the connection to Oman antenna planned for October 2009. It noted further that CLS offered to implement a strategy for the improvement of data timeliness whereby (i) new antenna/electronics capable of dealing with different types of satellites are being designed; and (ii) an optimal network of local receiving stations based on such design will be implemented.

3.3.3 In addition, the meeting noted the following outstanding user requirements:

- To further develop the local receiving station network to address data timeliness issue;
- To enhance the overall LUT performance, and maximize the number of satellites that each LUT is capable to process;
- To address the blind orbit issue and the data processing of global data sets from Svalbard with assistance from NOAA;
- To pursue efforts for making the Brazilian Satellites data available via the new Argos data processing system.

3.3.4 The report on developments having occurred since the Twenty-eighth meeting, in response to requirements expressed by users are reproduced in Annex V.

3.3.5 In response to these user requirements, the Meeting agreed on the action to be taken during the intersessional period, as listed in the table of actions (item 1).

### **3.4 Tariff Agreement and related matters**

3.4.1 Details of the finalized Argos operating costs for 2008 are given in Annex VI.

#### TIME SLOT

3.4.2 Regarding the requirement for the application of time slot accounting to all programmes, as identified at JTA-XXVII and subsequently implemented by CLS, the meeting noticed that all categories are significantly benefiting from the time slots. A trend towards an increased use of the time slot was noted for the “buoy & other” category. The meeting agreed that the scheme appeared to continue to be working equitably and efficiently. It agreed to continue the current scheme without modification.

#### 12 DAY-UNIT CAPPING

3.4.3 The meeting recalled JTA-XXVII decision to cap at 12 day-units (48 time slots) the consumption for animal platforms, and noted that about 600 PTTs are benefiting from the capping, mainly marine animals, but also birds and land animals to a lesser extent. Projected impact of the time slot for 2009 is estimated at a level of 122 PTT-years.

#### INACTIVE STATUS

3.4.4 The number of IDs in Inactive status is in the order of 300 platforms (drifters, land animals, and birds mainly) for a projected consumption for 2009 of about 153 PTT-years. Because such PTTs are increasing the system occupancy, the meeting once again urged the users and manufacturers to programme their PTTs according to the duration of the experiments.

#### UNUSED IDs AND SILENT SERVICE

3.4.5 The meeting recalled that JTA-XXVIII agreed to maintain the unused ID mechanism unchanged and increased the unused ID fee to 5 Euros per month per unit as of 1 March 2009, with the purpose of speeding-up the ID returns.

3.4.6 JTA-XXVIII also introduced new category, “Silent service” for which an administrative charge of EUR 3 per month per unit was to be applied beginning March 1, 2009. This was to distinguish between silent but operational IDs and Unused IDs. However, the meeting noted that the mechanisms for implementing the silent service fee appeared to be more complex than anticipated and CLS has deferred implementation of the fee pending further discussion at this JTA Session. The administrative effort needed to determine eligibility to the silent service was effectively laid on the users, and the meeting agreed that this was not practicable nor necessarily acceptable.

3.4.7 The meeting discussed a proposal from CLS to eliminate the unused ID fee, and the silent service fee, but establish an ID monthly charge at a level of 0.5€ to every ID assigned to a programme.

3.4.8 However, the meeting felt that users should be informed on the issue before the JTA would take any decision in this regard. It requested CLS to conduct a thorough analysis, and report on the issue to the EC, so that the rationale for introducing such a charge would be well understood and justified, and facts presented with enough details (e.g. number of unused IDs, number of 20-bit IDs that could be recovered, etc.). The analysis should be presented to the next JTA meeting.



3.4.9 The meeting also requested CLS and the ROCs to pro-actively pursue the recovering of unused IDs during the next intersessional period. In the absence of return of unused IDs during this period, the meeting agreed in principle that a subscription fee might be implemented beginning of 2011.

3.4.10 Meanwhile the meeting agreed to keep the existing system with the unused ID fee, and the silent service fee. While noting that the silent service fee cannot realistically be implemented, the meeting agreed to keep it in principle but not to apply it unless specifically requested by a user following a negotiation between CLS and that user. CLS was also invited to apply preventive measures (e.g. not allocating large number of IDs to a user at once).

3.4.11 In any case, the meeting agreed there was a need to encourage the good management of Argos ID numbers by programme managers, and the recycling of Argos IDs.

3.4.12 The above decisions are reflected in the 2010 Global Agreement, as reproduced in Annex VII.

### **3.5 Future Plans**

#### FIVE-YEAR OPERATING PLAN (FYP) 2010 - 2014

3.5.1 The first Five Year Plan (FYP) for 1999-2004 was initiated at JTA-XIX to foresee Argos expenses and anticipate Argos consumption by the users, as a tool to permit better oversight and management of the Argos JTA cost recovery financial model. The second FYP, for 2005-2009, was adopted at JTA-XXIV. The meeting recalled the principles agreed at JTA-XXVIII regarding the preparation for the Five Year Plan (FYP) for 2010-2014 and reflected in paragraph 3.5.1 of the JTA-XXVIII final report in.

- The benefits of JTA participation should be shared equally amongst all participants (Users);
- The revenue collected from Users should meet the costs of providing the service;
- Developments required by Users should be funded by Users;
- Costs of developments not of benefit (or of marginal benefit) and not driven by User requirements should not fall on Users;
- There should be a clear division between basic (funded) services and other (e.g. value added) services;
- The tariff structure should be kept simple with as few service categories as possible.

3.5.2 Based on those principles, a FYP for 2010-2014 was drafted by CLS, later reviewed and approved by the OPSCOM co-Chairpersons,.

3.5.3 The meeting thanked CLS for providing the draft FYP with sufficient lead time before the meeting. This permitted thorough review by the ROCs before the Session.

3.5.4 The FYP includes an analysis for each of the four JTA applications categories (Buoys and Others, Floats, Animals and, Fixed Stations) as well as the "Large Program" category, and is projecting an annual increase of ten percent of the Animal usage in the next five years. Buoys and Others, and Fixed Stations are projected to remain essentially stable at today's levels. The desired growth of Global Climate Observation Programs (e.g. Argo, Global Drifter Program, etc.) has the

potential to create modest expansions in Floats( 2-3%) and “Large Programs” (3-5%) in the early years of this plan.

3.5.5 On the other hand, the Argos JTA expenses are expected to increase to about 5% during 2010 – 2012 as the operational deployment of Argos 3 is completed and the Argos 4 investment will ramp up, and CLS marketing efforts on wildlife and ocean-met applications are reinforced. They should then decrease to a maximum of 2% inflation increase for the last two years of the plan. Other expenses should remain essentially stable during the five-year period.

3.5.6 The proposed plan called for an immediate (in year 2010) decrease in the daily rates for all applications categories and had a projected cumulated balance of 1.13M € at the end of year 2014.

3.5.7 The meeting noted that in case projected Argos usage increases for large programmes would not materialize in the initial years of this Plan, this would result in deepening the annual deficits as of 2010. In case this scenario was realized, the meeting requested the Executive Committee to explore options with CLS for reducing or eliminating the negative annual revenues.

3.5.8 Taking potential risks and uncertainties into account, the meeting agreed that it was prudent to target an approximate 1M€ positive cumulative balance during all the five years of the plan. The meeting therefore agreed on a slightly revised version of the FYP, which inter alia proposed to start its first year at a tariff rate still providing an immediate decrease in the daily rates through slightly less than the original version presented by CLS. The meeting adopted this new version of the FYP as reflected in Annex VI and agreed to review it again at the next JTA Session.

#### JTA OPERATING PRINCIPLES

3.5.9 The meeting reviewed the recommendations from the informal pre-JTA meeting, held in Paris, France, from 2 to 3 July 2009. The pre-JTA meeting had discussed the outcome from the previous JTA Session, and mainly addressed the role of the JTA and its future. In doing so, the pre-JTA meeting had proposed that the JTA should eventually agree and document its operating principles including the following elements:

- the basic aims and principles of the Argos Joint Tariff Agreement (JTA) as drafted at JTA-XXIII (Angra dos Reis, 2003), as well as its Terms of Reference;
- the definition and Terms of Reference and/or roles of stakeholders representatives, including Representatives of Country (ROCs), Responsible Organizations (ROs), Representative of a User Group (RUG), Service Argos, the Argos Operations Committee (OPSCOM), and the WMO and IOC Secretariats;
- the selection process, Terms of Reference, and terms for JTA office bearers (Chairperson, vice-Chairperson);
- the definition and Terms of Reference of a JTA Executive Committee (JTA-EC);
- principles for regular meetings of the JTA, including structure, desired outcome, invited participants, role of the secretariat, typical agenda for JTA meetings, and frequency;
- Typical intersessional workplan, and reporting process ;
- Format for national reports to the JTA.

3.5.10 The JTA-XXIX meeting concurred with the recommendations from the pre-JTA meeting, and after a few changes, adopted the JTA Operating Principles as reproduced in Annex VIII. It further accepted the kind offer by Mr. Ken Jarrott to fully review the text, with specific attention to the present Annex A of the Operating Principles, in order to ensure its overall consistency and to polish its wording, as necessary.

3.5.11 The JTA-XXIX agreed with the following:

- (i) CLS should make efforts to keep the ROCs informed of Argos developments and the status/evolution of Argos use in their countries, on a routine basis;

- (ii) Adequate representation of Argos users should be ensured (e.g. participation of animal tracking community with/through WWF), taking into account the geographic balance (through ROCs);
- (iii) The significant benefit of close connection between JTA and DBCP was recognized. While this should be maintained, the JTA should seek connection with wider range of the user community. For example, the regular session can be alternatively taking place in conjunction with DBCP, and other major user group meetings (e.g. sea turtle symposium, fish tagging, bio-logging, etc.);
- (iv) Financial information presented by CLS for cost attributed to the JTA community should be condensed for use by the broader community. If costs are to increase, there should be some information delivered to the JTA about what actually drives the cost;
- (v) The duty to review the finances, and the JTA Five Year Plan (FYP) should be discharged to the Executive Committee and the OPSCOM, and synthetic reports presented at JTA annual Sessions. The JTA should then focus on the user costs and look at the different tariff categories, etc.
- (vi) The Executive Committee should address other satellite data telecommunication systems than Argos and make proposals on how to address them within the JTA;
- (vii) If organized in conjunction with the DBCP, the JTA meeting should last 2.5 days, including 1 day of informal discussions before the formal 1.5 day JTA Session. If organized separately from the DBCP, the JTA Sessions should last 2.5 days;
- (viii) In order to permit developing an equitable tariff structure, guiding principles regarding the tariff structure for negotiating the tariff should be developed.

3.5.12 The JTA elected the following three members to serve in the Executive Committee:

- Joe Linguanti (Canada)
- Ken Jarrott (Australia)
- Johan Stander (South Africa)

#### STATUS OF THE JTA AND SUPPORT TO THE JOINT SECRETARIAT AND THE EXECUTIVE COMMITTEE

3.5.13 The JTA-XXIX meeting agreed that the present status of JTA with international nature should be maintained with WMO and IOC involvement, which would facilitate involving wider groups of users such as the animal trackers.

3.5.14 The JTA-XXIX meeting agreed on providing funding to cover Secretariat support and lodging for some members of the Executive Committee at a level not exceeding 0.5% of the Argos costs attributed to the JTA. According to the agreed upon operating principles, the Executive Committee shall analyze the JTA administrative costs to be reimbursed by the JTA, and make recommendations to the Chairperson who will make the final decision.

3.5.15 As for previous years, the meeting agreed to maintaining the present arrangements for the funding of the independent JTA chair through the DBCP Trust Fund as a level of USD 15k.

## **4. 2010 GLOBAL AGREEMENT**

4.1 The Terms and Conditions for the 2010 Agreement are given in Annex VII.

4.2 From the 2009 Agreement, the following modifications were introduced to the 2010 Agreement:

- (i) 2009 is replaced by 2010;

- (ii) Under "TIME PERIOD OF COVERAGE", These Terms and Conditions are valid for the time period beginning on January 1 and ending on December 31, 2010;
- (iii) Under "USER BASIC SERVICE CHARGES", A and B coefficients for all platform categories are provided in table below:

Category	A (€)	B (€)
<b>Buoys and others</b>	15	5.5
<b>Fixed Stations</b>	15	3
<b>Animals*</b>	15	8.25
<b>Subsurface Floats</b>	15	8.25

- (iv) Under "UNUSED IDs", new paragraph reads:

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. 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.

- (v) Under "SILENT SERVICE", new paragraph reads:

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

- (vi) *DISCOUNT SCHEME FOR LARGE PROGRAMMES*, replace table by the one below:

Number of platform-years	PTT-day unit (B) Buoys & others	PTT-day unit (B) Floats
300	5	7.5
600	4	6
900	3	4.5
1200	2	3

## 5. FORMAL ISSUES

### 5.1 Elections

5.1.1 The meeting noted the desire of Mr Yves Tréglos not to continue as JTA Chairperson for the future. Mr Tréglos has been involved with the JTA since its inception in the 1980s by providing long-term Secretariat support on behalf of the IOC, including in times when the very nature of the negotiations made the task very delicate for the Secretariat, as well as labour intensive. After his retirement from IOC, he was first elected JTA Chairperson at the twenty-fourth JTA Session in Chennai, India, in October 2004, and has since then effectively helped the JTA to run smoothly and restructure itself in a more efficient *modus operandi*. The meeting sincerely thanked Mr Tréglos for his past excellent contributions to the success of the JTA and wished him every success for the future.

5.1.2 The Meeting elected Mr Frank Grooters as its independent Chairperson, to hold office until the end of JTA-XXXI.

5.1.3 The Meeting elected Mr Eric Locklear as its unpaid Vice-Chairperson, to hold office until the end of JTA-XXXI.

## **5.2 Dates and Venues of the Next Meeting**

5.2.1 In line with the agreement of the preceding 25th session of the Data Buoy Cooperation Panel, it was agreed to hold the 30th Meeting of the JTA in Oban, Scotland, at the kind invitation of the Scottish Association for Marine Science (SAMS).

5.2.2 Tentative dates for the meeting were agreed as 30 September to 2 October 2010, on Thursday to Saturday of the same week as the 26th Session of the DBCP (with informal discussions to take place on the 30 September before the formal Session, 1-2 October 2010).

## **5.3 Closure of the Meeting**

5.3.1 The meeting thanked the Intergovernmental Oceanographic Commission (IOC) of UNESCO for hosting the meeting, and congratulated its success in running and supporting the DBCP and JTA sessions.

5.3.2 The meeting expressed gratitude to Mr Yves Tréglos for his outstanding long-term dedicated service to the JTA, not only as independent Chairperson since 2004, but also as IOC Secretariat staff since almost the inception of the JTA and until 2003.

5.3.3 The meeting closed at 11:40 hours on 3 October 2009.

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**ANNEX I**

**LIST OF PARTICIPANTS**

**I. PARTICIPANTS FROM MEMBER STATES**

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**ANNEX II**

**AGENDA**

- 1. ORGANIZATION OF THE MEETING**
    - 1.1 OPENING OF THE MEETING
    - 1.2 ADOPTION OF THE AGENDA
    - 1.3 WORKING ARRANGEMENTS
  - 2. REPORT OF THE CHAIRPERSON OF THE JTA**
  - 3. REPORT ON THE 2009 GLOBAL AGREEMENT**
  - 4. REPORT ON THE DEVELOPMENT OF CLS**
  - 5. REVIEW OF USER'S REQUIREMENTS**
  - 6. REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS**
    - 6.1 CLS FINANCIAL STATEMENT
    - 6.2 THE FIVE YEAR OPERATING PLAN (FYP)
    - 6.3 SPECIAL SERVICE CHARGES, AND ADDED VALUE SERVICES
  - 7. TERMS AND CONDITIONS OF THE 2010 GLOBAL AGREEMENT**
  - 8. THE FUTURE OF THE JOINT TARIFF AGREEMENT**
  - 9. FUTURE PLANS AND PROGRAMMES**
  - 10. ELECTION OF THE CHAIRPERSON AND VICE-CHAIRPERSON**
  - 11. DATE AND PLACE OF THE NEXT MEETING**
  - 12. CLOSURE OF THE MEETING**
-

## ANNEX III

## REPORT ON THE 2009 AGREEMENT

*1. Average active PTTs per month per country*

COUNTRY	2008 actual average active PTTs/month	2009 extrapolated average active PTTs/month	Extrapolated progression in percentage
AUSTRALIA	471	503	7%
AUSTRIA	2	2	0%
BELGIUM		6	-
BOTSWANA	3	6	100%
BRAZIL	6	6	0%
CANADA	1 485	1 844	24%
CHILE	19	19	0%
CHINA	73	74	1%
DENMARK	97	129	33%
EUROPE(*)	44	10	-77%
FINLAND	10	16	60%
FRANCE(*)	433	473	9%
GERMANY	322	365	13%
INDIA	114	119	4%
ITALY	135	184	36%
KOREA, REPUBLIC OF	128	122	-5%
NETHERLANDS	50	85	70%
NEW ZEALAND	28	34	21%
NORWAY	120	95	-21%
RUSSIA	7	7	0%
SOUTH AFRICA	73	75	3%
SPAIN	170	240	41%
SWEDEN	19	20	5%
SWITZERLAND(**)	15	7	-53%
OTHER	12	15	25%
TANZANIA, UNITED REP	2	2	0%
UNITED ARAB EMIRATES	134	194	45%
UNITED KINGDOM	314	490	56%
UNITED STATES	6 250	6 230	0%
<b>Total</b>	<b>10 532</b>	<b>11 372</b>	<b>8%</b>

(\*) E-SURFMAR program was attached is attached to "EUROPE" in 2008.

(\*\*) Switzerland joined JTA in 2007

**Table 2: Average number of Active platforms per month and per country, actual in 2008 and extrapolated in 2009 from January-May average**

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.

## 2. Consumption per country

COUNTRY	Actual 2008 PTT.years	Extrapolated 2009 PTT.years	Extrapolated consumption (percentage)
AUSTRALIA	95	96,4	1,5%
AUSTRIA	0,1	0,1	0,0%
BELGIUM		0,4	
BOTSWANA	0,1	0,3	200,0%
BRAZIL	1,2	0,7	-41,7%
CANADA	219,2	231,4	5,6%
CHILE	3	2,5	-16,7%
CHINA	10,4	17	63,5%
DENMARK	26,7	29,3	9,7%
EUROPE(*)	39,9	29,17	-26,9%
FINLAND	1,8	2,7	50,0%
FRANCE(*)	130	161	23,8%
GERMANY	40,7	42,8	5,2%
INDIA	24,3	20,4	-16,0%
ITALY	27,9	46,9	68,1%
KOREA, REPUBLIC OF	14,3	15,1	5,6%
NETHERLANDS	11,1	15,6	40,5%
NEW ZEALAND	15,2	16	5,3%
NORWAY	29,3	16,7	-43,0%
RUSSIA	1,5	0,4	-73,3%
SOUTH AFRICA	20,8	20	-3,8%
SPAIN	34,7	40,1	15,6%
SWEDEN	2,3	2,1	-8,7%
SWITZERLAND(**)	2,4	1,3	-45,8%
OTHER	1,4	2,3	64,3%
TANZANIA, UNITED REP	0,1	0	-100,0%
UNITED ARAB EMIRATES	27,5	36,7	33,5%
UNITED KINGDOM	57,1	65,9	15,4%
UNITED STATES	2 127,00	2 053,20	-3,5%
<b>Total</b>	<b>2 965.1</b>	<b>2 937,4</b>	<b>-0,9 %</b>

Table 3: Numbers of PTT.years. Actual consumption in 2008 and extrapolation for 2009 based on January-August actual consumption

(\*) E-SURFMAR program was attached to "FRANCE" in 2006 and is attached to "EUROPE" in 2007.

(\*\*) Switzerland joined JTA in 2007

The PTT-years are the numbers of day units with time slot calculation where appropriate divided by 366 days for 2008, and by 365 for 2009.

### 3. Consumption evolution over 1 year

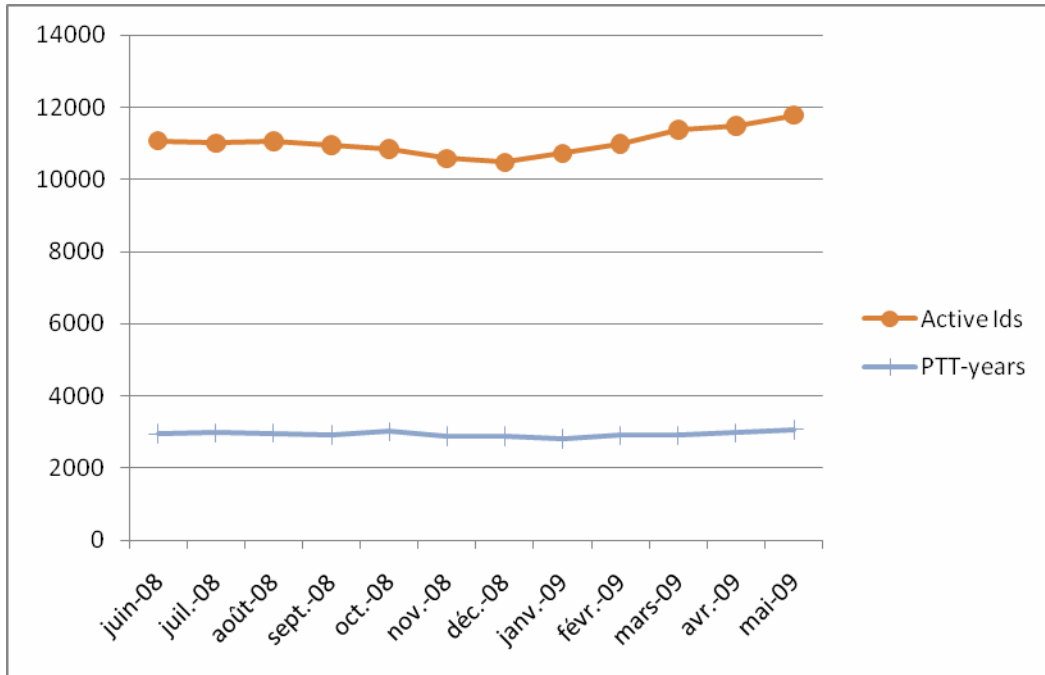


Figure 1: Consumption evolution over the previous 12 months in Active PTTs and PTT.years

During the 5 first months of 2009, the number of active PTTs and the number of PTT-years, show an increasing trend.

### 4. Monthly evolution by platform category

#### Drifters & others. Floats. Animals. Fixed stations

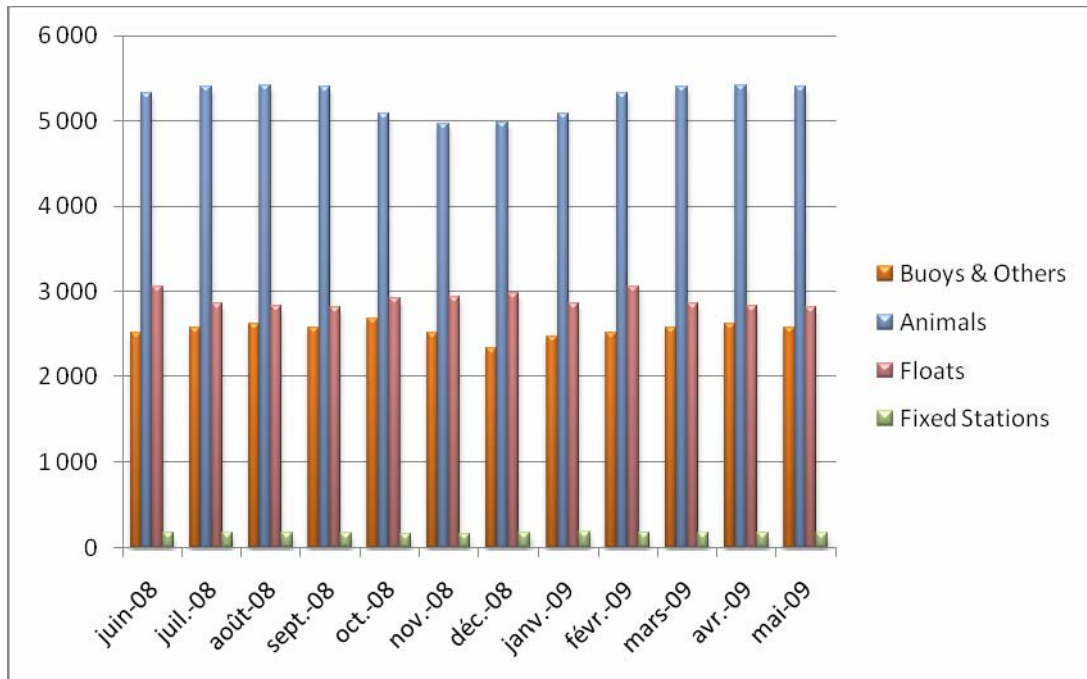


Figure 2: Active PTT evolution

Compared with the previous year, the overall active PTT and thus transmitter number in the field are increasing. The main category producing this increase is, as previous years, the “Animals” family. The “Buoys” and “Subsurface floats” are rather stable.

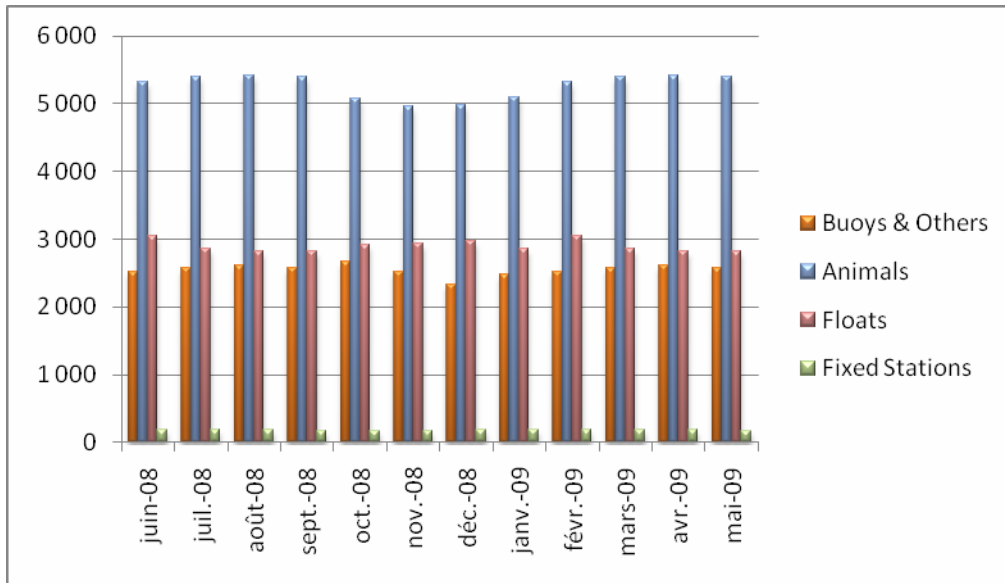


Figure 3: PTT-years evolution

It can be noticed that:

The PTT-years picture shows consequent differences in term of actual consumption between categories:

- “Drifters & Others” is still the major player followed by the “Animals” which consumption keeps increasing.
- “Floats” and “Fixed Stations” consumptions in PTT-years are close.

### 5. Time slot analysis

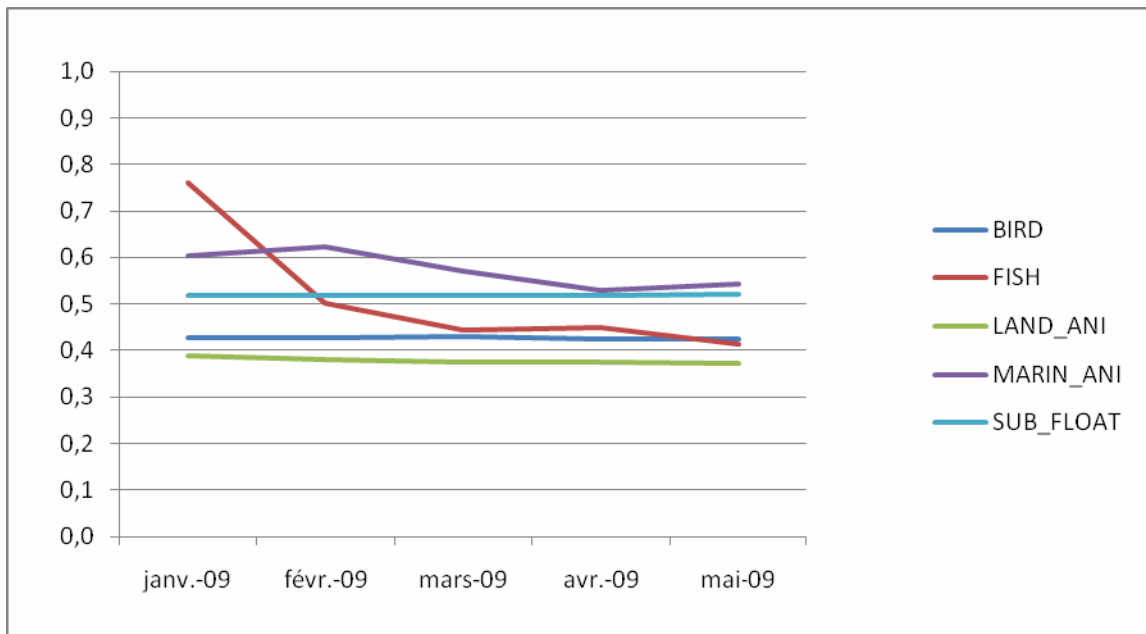
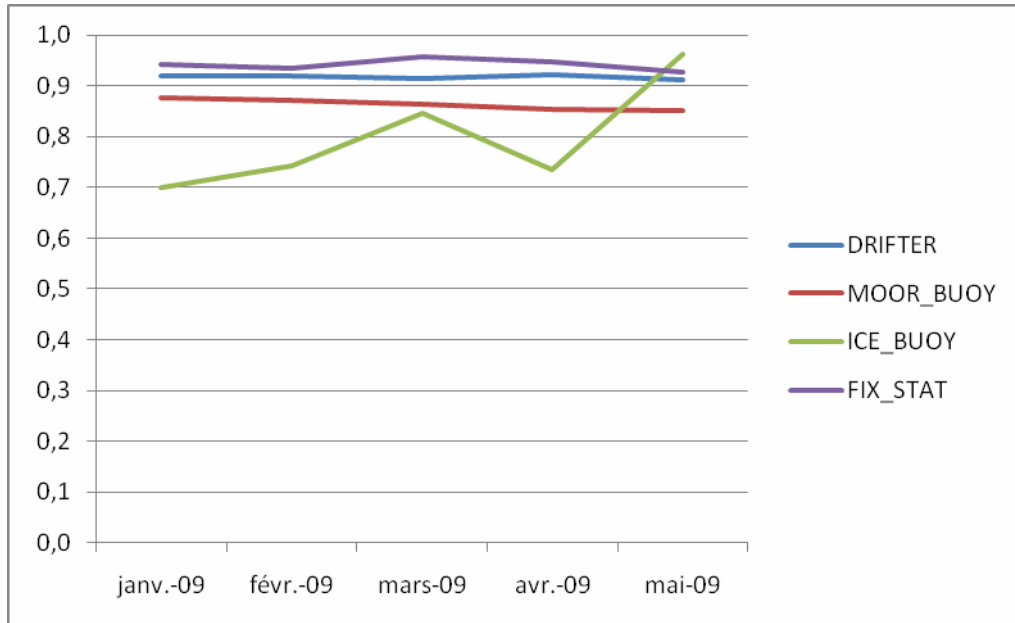


Figure 4: Average time slot level by platform category

- This diagram shows the monthly evolution of the average time slot ratio per category of PTTs benefiting from time slot accounting since 2005. 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 noticed that all categories are significantly benefitting from the time slots and that the ratios are quite stable for all on average, except for fish as previous years and, on a minor scale, for marine animals. Ratios are also very similar to the 2008 ones.



**Figure 5: Average time slot level by platform category**

This diagram shows the monthly evolution of the average time slot ratio for the categories “Buoys & Others” and “Fixed Stations” which started benefiting from time slot accounting in 2007.

The ratios for drifters and fixed stations are similar to the 2008 ones. A decrease of day use is noted for moored buoys whose ratio is now around 0.85. In 2009, due to the time slot accounting, the overall consumption of these platforms will be reduced by 68 PTT-years in 2009 (against 46 PTT-years in 2008) which indicates a trend towards an increased use of time slots for the “Buoy & others” category.

## **6. Impact of the 12 day.unit capping**

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

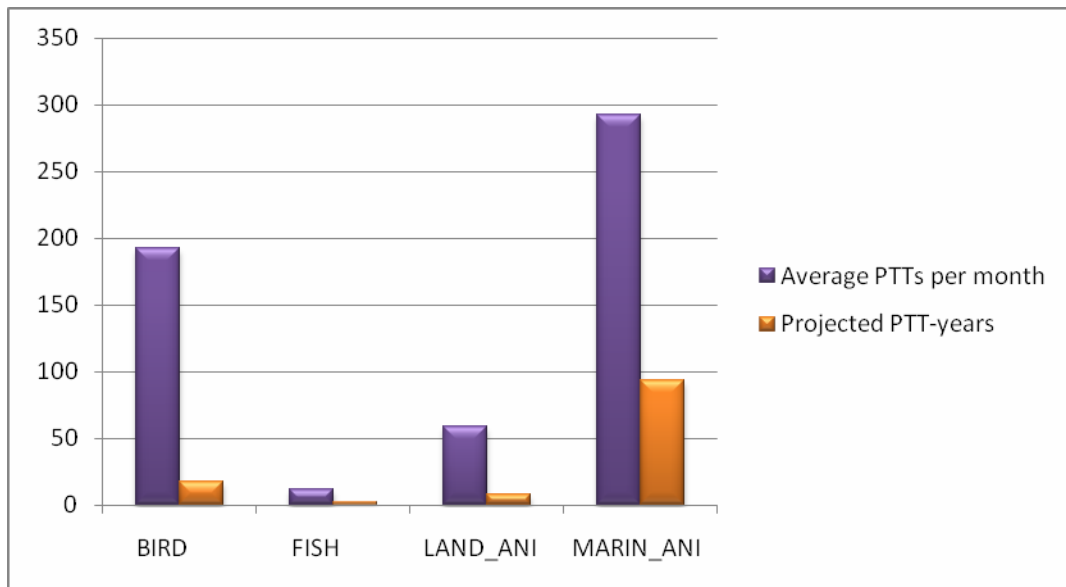


Figure 6: Average PTTs affected and Projected PTT-years “gain” by animal category

Each month, some **600** PTTs actually benefit from the capping. As in 2008, the Marine Animals is the first category to benefit with ~300 platform concerned each month and ~100 PTT-year benefit expected for 2009. Still birds, and also land animals, on a minor scale, are also benefitting from this pricing mechanism.

In total, the capping represents a projected impact of ~122 PTT-years (~44 600 day-units) for 2009.

### 7. Inactive status:

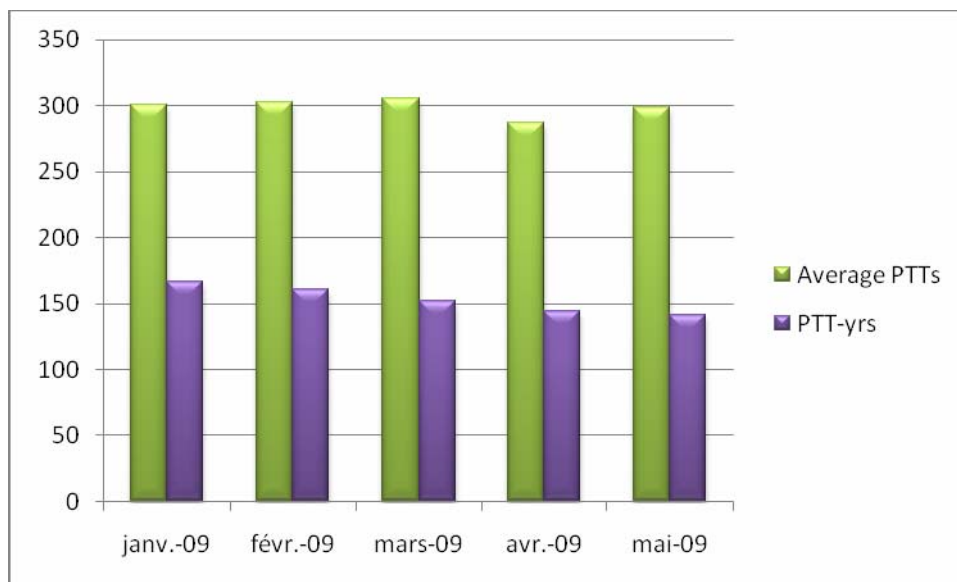


Figure 7: Inactive PTTs evolution in term of number of IDs and PTT-years

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

It can be noticed that the number of IDs in Inactive status varies around 300. The PTT-year projected consumption for 2009 is around 153 PTT-years.

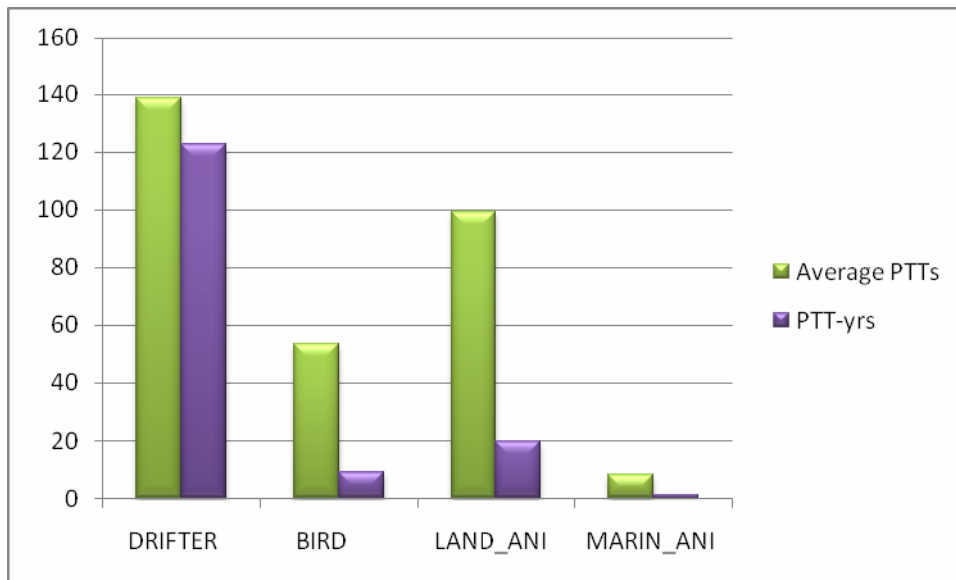


Figure 8: Inactive PTTs evolution in term of number of IDs and PTT-years

As already mentioned in previous JTA reports, these PTTs are increasing the system occupancy for no use. CLS insists again on the recommendation to users and manufacturers to take this into account by programming their PTTs for the duration of the experiment.

### 8. History of the JTA participation from 1982 to 2008

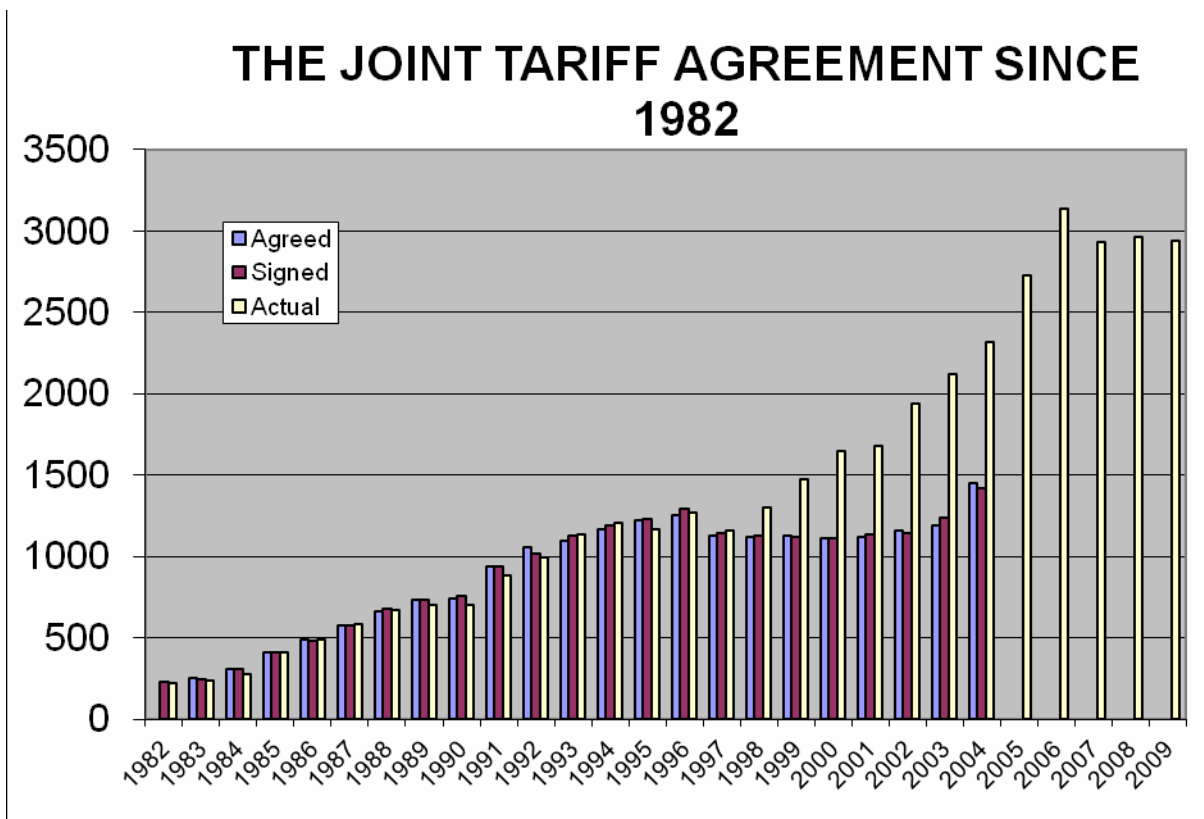


Figure 9: Agreed, signed and actual consumption in PTT-years for all countries

**Notes:**

- 1) Since the implementation of the new tariff structure in 2005, we only provide actual



- consumption.
- 2) Consumption was reduced in 2007 (~46 PTT-year) by applying the time slots to all categories.
  - 3) Value for 2009 is a projection based on January to May 09 consumptions.
  - 4) Since 2008, the consumption in PTT-years is reduced by ~138 PTT-years by the capping mechanism being applied to all animals, and also by applying the time slots to all categories.
-

**ANNEX IV**

**REPORT ON 2008-2009 OPERATIONS**

**1. Operations Highlights**

- 30 years of ARGOS (October 1978 – October 2008),
- METOP HRPT ON/OFF since September 29th, 2008 on European zone,
- New Argos GTS processing system in operation since May 20th, 2008,
- No Power outage test done in 2008
- Successful launch of NOAA N Prime (February 2009) with an Argos-3 instrument
- NOAA N Prime delivered to all ARGOS users on August 3<sup>rd</sup>, 2009
- ARGOS3 (Downlink) into operation
- 3 New antennae with EARS network
- Disaster Recovery implementation
- Monthly Argos operation and GTS monitoring reports available

**2. Space Segment**

During 2008, Argos instruments were onboard 5 POES's spacecrafts. The current status information on each spacecraft and its Argos various subsystems is described as follow:

Satellites	Launch date	NOAA status	Real time data (HRPT)	Stored data (STIP)	Data AVHRR
NOAA-19 (NP)	06-Feb-09	PM Primary	ok	Gilmore, Wallops	ok
METOP-A (MA)	19-Oct-06	AM Primary	Ok/Nok*	Svalbard	ok
NOAA-18 (NN)	20-May-05	PM Secondary	ok	Gilmore, Wallops	ok
NOAA-17 (NM)	24-Jun-02	AM Secondary	ok	Gilmore, Wallops	ok
NOAA-16 (NL)	21-Sep-00	PM backup	ok	Gilmore, Wallops	ok
NOAA-15 (NK)	13-May-98	AM Backup	ok	Gilmore, Wallops	ok
NOAA-14 (NJ)	30-Dec-94	Decommissioned 23 May 2007			
NOAA-12 (ND)	19-Oct-06	Decommissioned 10 August 2007			
NOAA-11 (NH)	24-Sep-88	Decommissioned 16 July 2004			

**Figure 1: Argos Constellation**

\* Figure 2 shows the regional service coverage of Europe and the North Atlantic. A-HRPT scheduled activities are defined on Orbit Switch ON and Switch OFF.

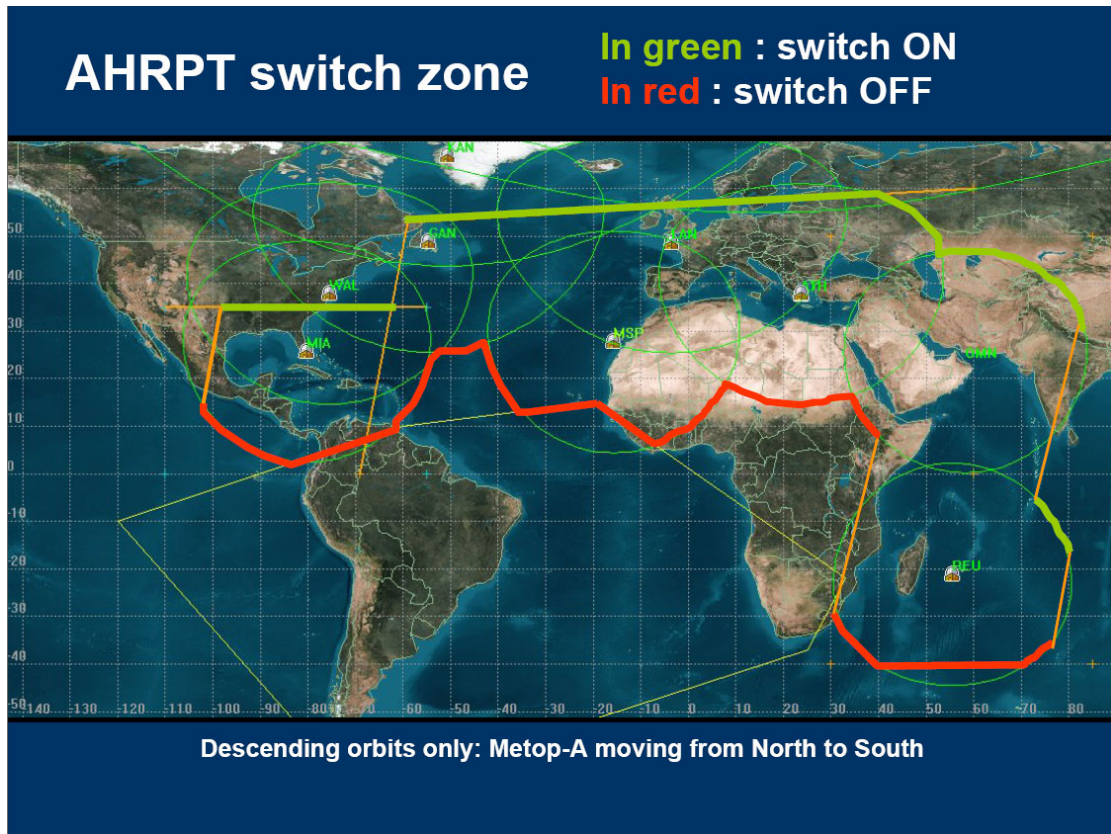


Figure 2: A-HRPT Switch Zone

Figure 3 shows Local Equator crossing time (ascending node) and associated predictions for 6, 12 and 24 months in February 2009.

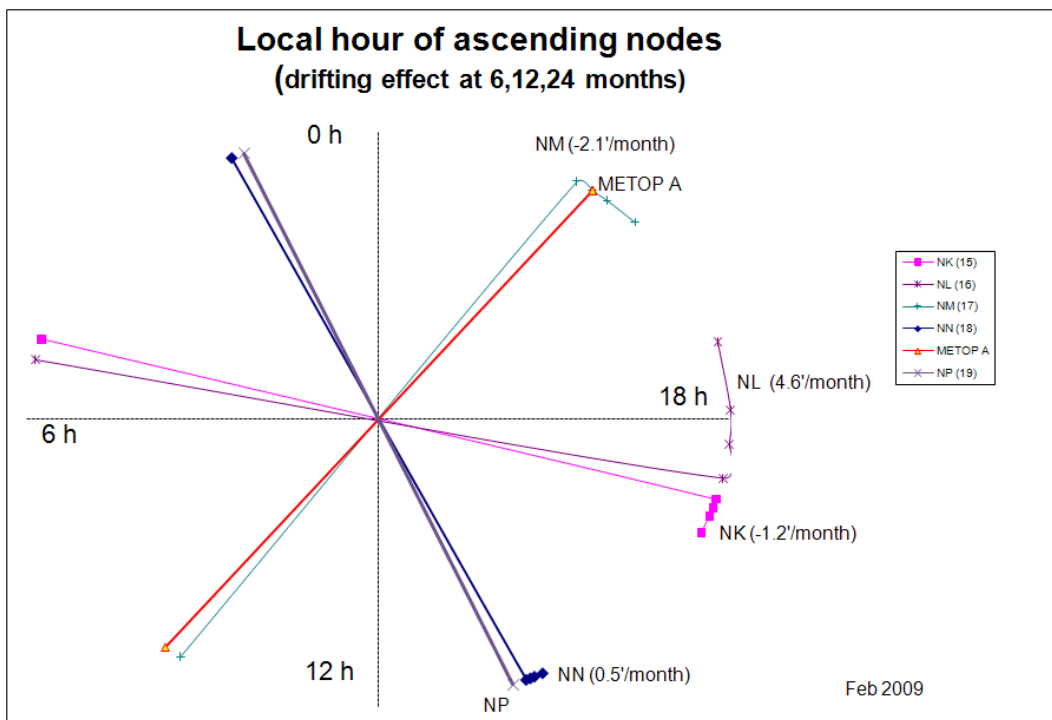
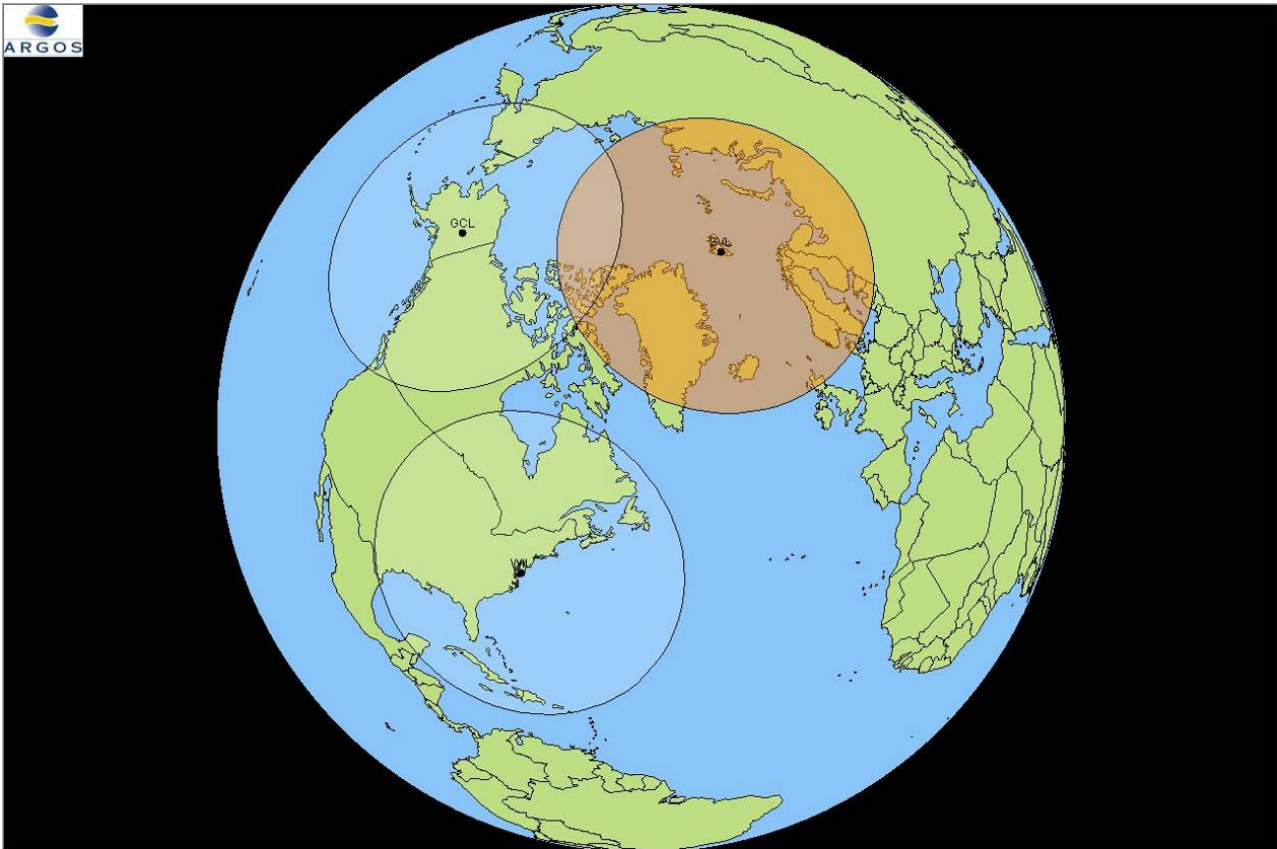


Figure 3: Local Equator crossing time

### 3. Ground Segment

#### 3.1. Ground receiving stations



**Figure 1 Global stations**

Operations were nominal on the two NOAA global stations (Fairbanks (AK, USA) and Wallops Island (VA, USA)) able to acquire the STIP telemetry from NOAA satellites. NOAA-15, NOAA-16, NOAA-17 and NOAA-18 STIP data were delivered by these 2 global stations (14 datasets per day in average).

EUMETSAT global station (Svalbard (NO)) has acquired ADCS data from METOP-A and NOAA-18 (replaced by NOAA-19 from August 2009) and relaying these data through EUMETCAST network to CLS and CLSA (through NOAA/NESDIS) on a nominal mode during 2008. Figure 5 shows daily NOAA and METOP global and real-time dataset acquisition by the Global Processing Centre in November 2008.

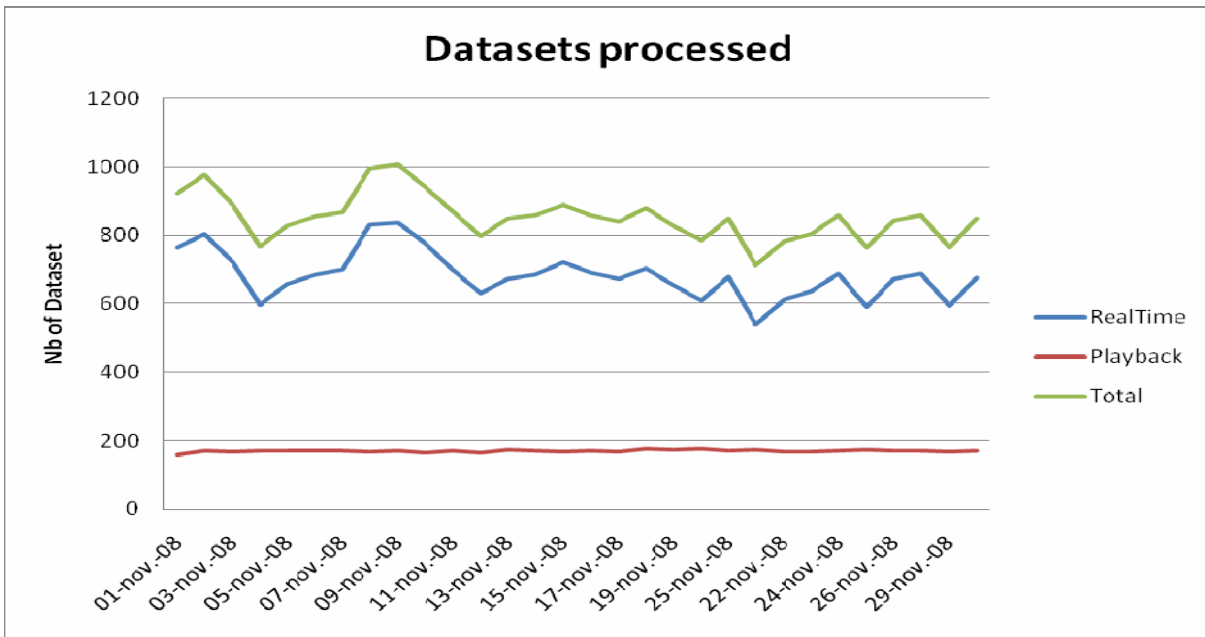


Figure 5: NOAA and METOP playback and real-time datasets processed per day in Nov08

Figure 6 shows monthly NOAA and METOP global and real-time dataset acquisition by the Global Processing Centre in 2008.

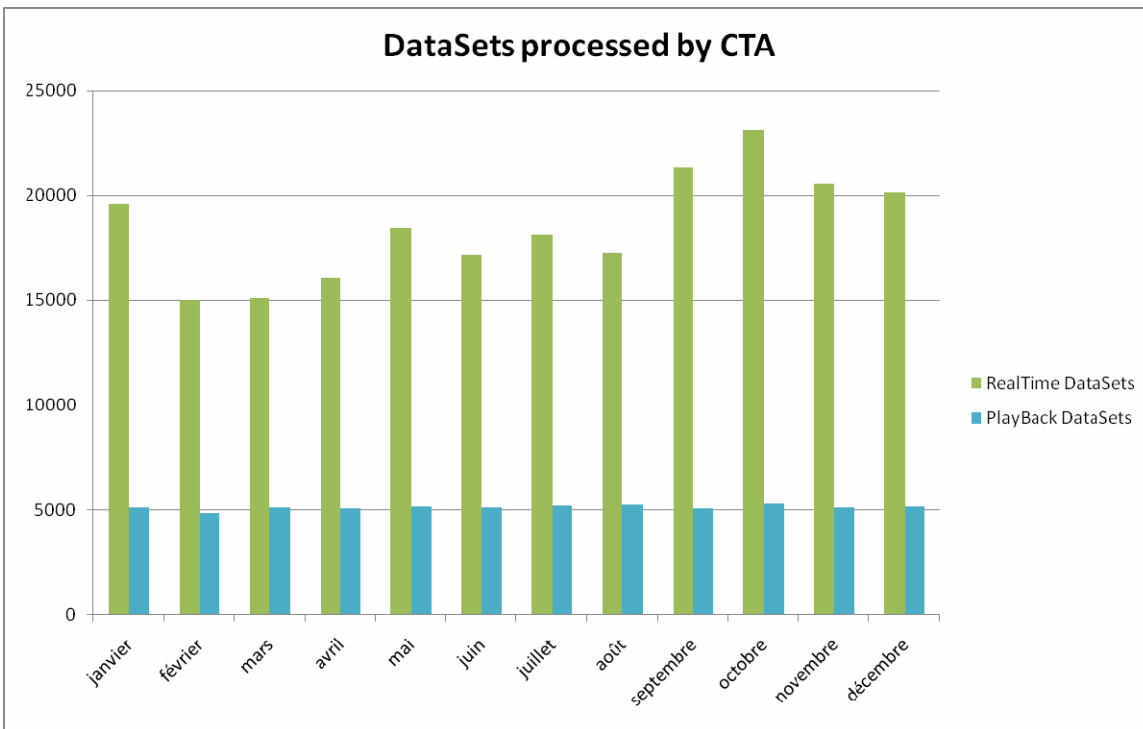


Figure 6: NOAA and METOP playback and real-time datasets processed per Month in 2008

Figure 7 shows global dataset arrival times on November 30<sup>th</sup>, 2008 into a Global processing Centre.

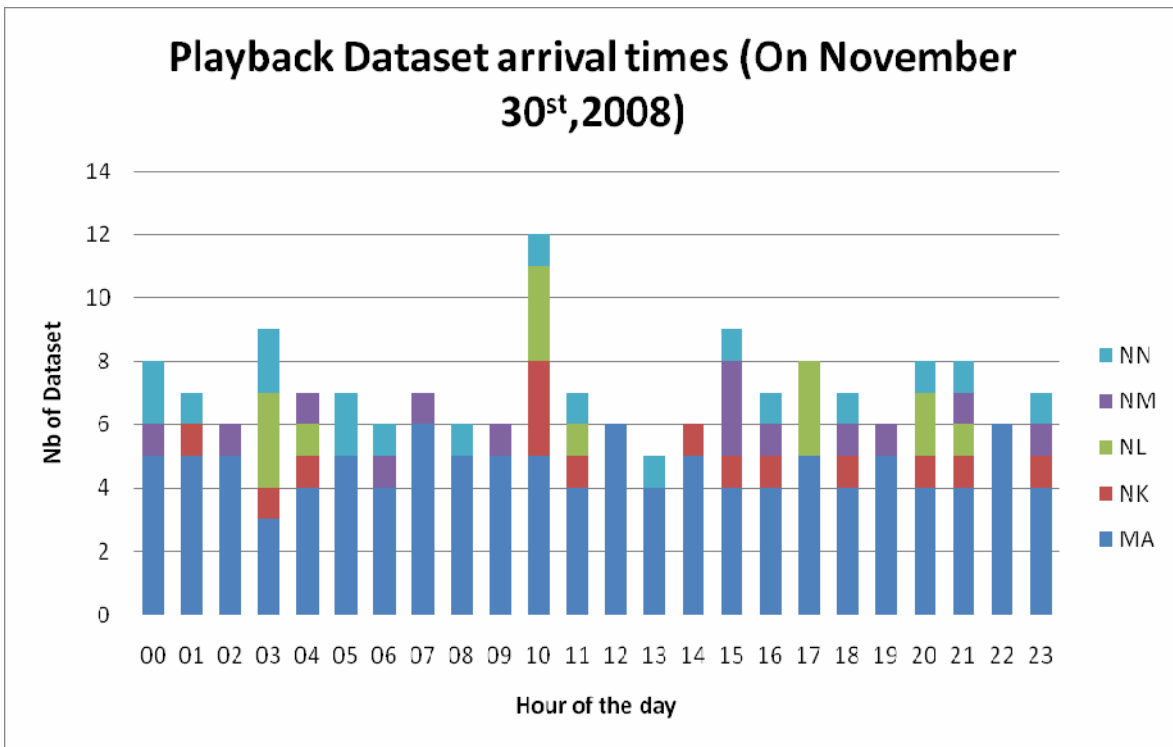


Figure 7: Playback Dataset arrival times on NOV30th, 2008

### 3.2. Regional stations

Figure 8 shows the 2008/2009 ARGOS real-time coverage.

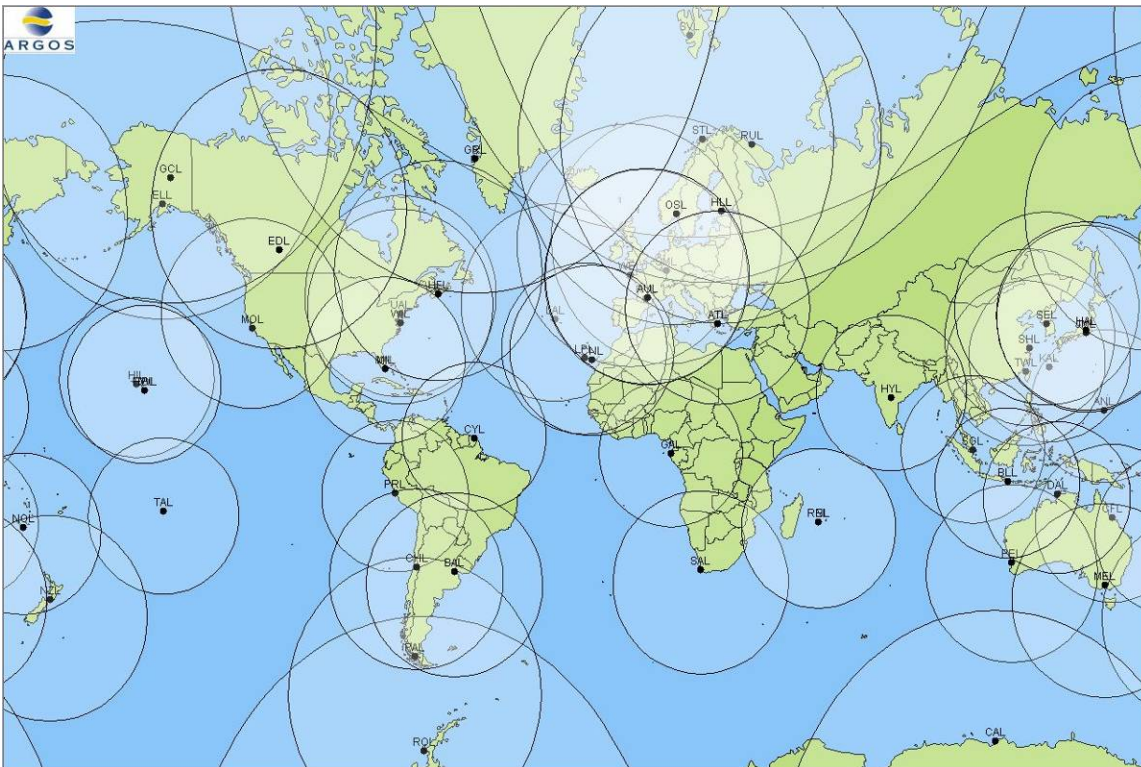


Figure 8: Realtime Coverage Map

CLS and CLS America Inc. pursued their efforts in 2008 and 2009 to consolidate the number of receiving stations able to provide TIP data sets from the NOAA and METOP satellites.

4 new stations were added to the Argos real time network:

- Fiji (FIJI) reactivated since July 9th, 2009
- Athens (GREECE) belongs to EARS network, activated since May 6th, 2009
- Kangerlussuaq (GROENLAND) belongs to EARS network, activated since May 6th, 2009
- Maspalomas (SPAIN) belongs to EARS network, activated since May 6th, 2009.

There are currently 56 stations delivering real-time datasets (TIP) to CLS and CLS America Inc. Most of them process data from NOAA satellites allowing us to maintain a good throughput times for results delivery.

List of regional receiving stations:

Antennas	Code	Country	Operator	Possible satellites
Andersen USAF	AN	UNITED STATES	CLS	NK,NM,NL,NP
Athens	AT	GREECE	CLS	NK,NL,NM,NN
Aussaguel	AU	FRANCE	CLS	NM,NN
Buenos Aires*	BA	ARGENTINA	INTA	NK,NN,NM
Bali	BL	INDONESIA	PT CLS	NK,NL,NM,NN
Casey	CA	AUSTRALIA	BOM	NK,NM,NP
Cape Ferguson NOAA	CF	AUSTRALIA	NOAA	NK,NL,NM,NN
Santiago	CH	CHILE	Meteo Chile	NK,NN,NP
Las Palmas	CN	SPAIN	CLS	NK,NL,NM,NN
Cayenne	CY	FRANCE	IRD	NK,NN,NM
Darwin	DA	AUSTRALIA	BOM	NK,NM,NN,NP
Davis	DV	AUSTRALIA	CLS	NK,NL,NM,NP
Edmonton	ED	CANADA	Environment Canada	NK,NN,NM
Elmendorf USAF	EL	UNITED STATES	CLS	NK,NL,NM,NN,NP
Fiji	FI	FIJI	CLS	NK,NM,NP
Libreville	GB	GABON	CNES/CLS	NK,NL,NM,NN
Gilmore	GC	UNITED STATES	NOAA/NESDIS	NK,NL,NM,NN,NP
Sondre	GR	GREENLAND	DMI	NK,NL,NM,NN
Halifax	HF	CANADA	Canada Coast Guard	NK,NL,NM,NN
Hickam USAF	HI	UNITED STATES	CLS	NK,NL,NM,NP
Hatoyama	HT	JAPAN	JAXA/EOC	NK,NL,NM,NN,MA
Hawai	HW	UNITED STATES	NOAA/NWS	NK,NL,NM,NP
Hyderabad	HY	INDIA	INCOIS	NK,NL,NM,NN
Tokyo	JM	JAPAN	JAMSTEC	NK,NM,NN
Kandena USAF	KA	JAPAN	CLS	NK,NL,NM,NN,NP
Lajes USAF	LA	SPAIN	CLS	NK,NM,NN
Lima METOP	LM	PERU	CLS Peru	NK,NL,NM,NN
Las Palmas	LP	SPAIN	Univ. Las Palmas	NK,NL,NM,NN
Miami NOAA	MA	UNITED STATES	NOAA/AOML	NK,NL,NM,NN,NP
Melbourne	ME	AUSTRALIA	BOM	NK,NL,NM,NN,NP
Monterey	MO	UNITED STATES	NESDIS/NWS	NM,NN
Noumea Meteo France	NC	NEW CALEDONIA	Meteo France	NK,NM,NN
Noumea IRD	NO	FRANCE	IRD	NK,NM,NN
Wellington	NZ	NEW ZEALAND	Met Office	NK,NN,NM
Oslo	OS	NORWAY	NMI	NK,NL,NM,NN
Perth	PE	AUSTRALIA	BOM	NK,NM,NN,NP
Lima	PR	PERU	CLS Peru	NK,NL,NM,NN
Petropavlosk	PT	RUSSIAN FEDERATION	Complex System	NK,NL,NM,NN

Ile de la Reunion	RE	FRANCE	IRD	NK,NN,NM
Ile de la Reunion	RN	FRANCE	Meteo France	NM, NP
Rothera	RO	INDONESIA	PT CLS	NK,NL,NM,NN
Toulouse, Lannion	RS	FRANCE	CLS	MA
Cape Town	SA	SOUTH AFRICA	CLS/SAWB	NK,NL,NM,NN
Seoul	SE	KOREA, REPUBLIC OF	KMA	NK,NM,NP
Singapore	SG	CHINA	SMM	NK,NL,NM,NN,NP
Shangai	SH	CHINA	East China Sea Fisheries	NK,NL,NM,NN
Sembach USAF	SM	GERMANY	CLS	NK,NM,NN
Tromsoe	ST	NORWAY	KSAT	NL,NM,NN
Papeete	TA	FRANCE	IRD	NL,NM,NN
Taiwan	TW	TAIWAN, REPUBLIC OF CHINA	National Taiwan Ocean Uni	NK,NM,NN,NP
Valley Forge USAF	UA	UNITED STATES	CLS	NK,NL,NM,NN
Toulouse, Lannion	WE	FRANCE	Meteo France	NM,NN,NP
Wallops	WI	UNITED STATES	NOAA/NESDIS	NK,NL,NM,NN,NP
Athens	XA	GREECE	EARS	NK,NL,NM,NP
Kangerlussuaq	XK	GROENLAND	EARS	NK,NL,NM,NN
Maspalomas	XM	SPAIN	EARS	NK,NL,NM,NN,NP

Antennas under agreement
CLS and subsidiaries antennas
Customer antennas under CLS maintenance contract
Antennas without written agreement ("Best effort")

Future METOP Real-time coverage



Figure 9: Future METOP-A realtime Coverage

In 2008, Gilmore, Wallops, Lannion and Hatoyama were fully operational for METOP real-time datasets.



### 3.3. Orbitography network

Figure 10 displays CLS Orbitography beacons location.

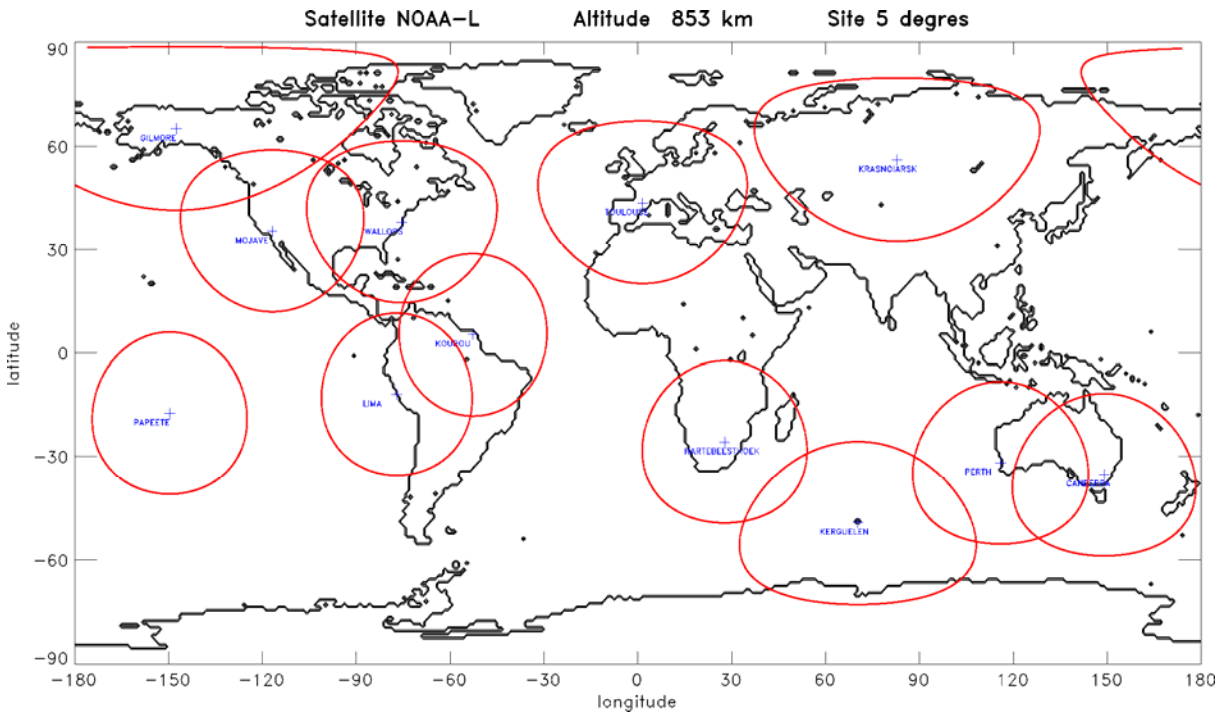


Figure 10: Orbitography PTT Network

1- TOULOUSE	OK
108 - GILMORE_N	OK
109 - KOUROU_N	OK
111 - HARTBEEES_N2	Small amount data on NOAA 12
112 - CANBERRA_N	OK
113 - LIMA-N	OK
114 - KRASNOIARSK	Stopped on 01/26/06. Expecting administrative paper in order to restart this PTT. A. Salman in charge.
116 - PAPEETE	OK
118 - WALLOPS	OK
119 - KERGUELEN_N	OK
149 - PERTH	OK
110 - MOJAVE	OK.

### 3.4. Processing centers



Figure 11: Global Processing Centers and Regional Processing Centers

### 3.5. Global processing centers



Figure 12: CLS America, Inc. Global Processing Center

The two global processing centers in Toulouse and Largo were nominal over 2008.

A major software change was done into both global processing centers in May 2008. ARGOS2001 Phase3B (GTS) is now in place and operated by CLS and CLS America, Inc. Operational teams.

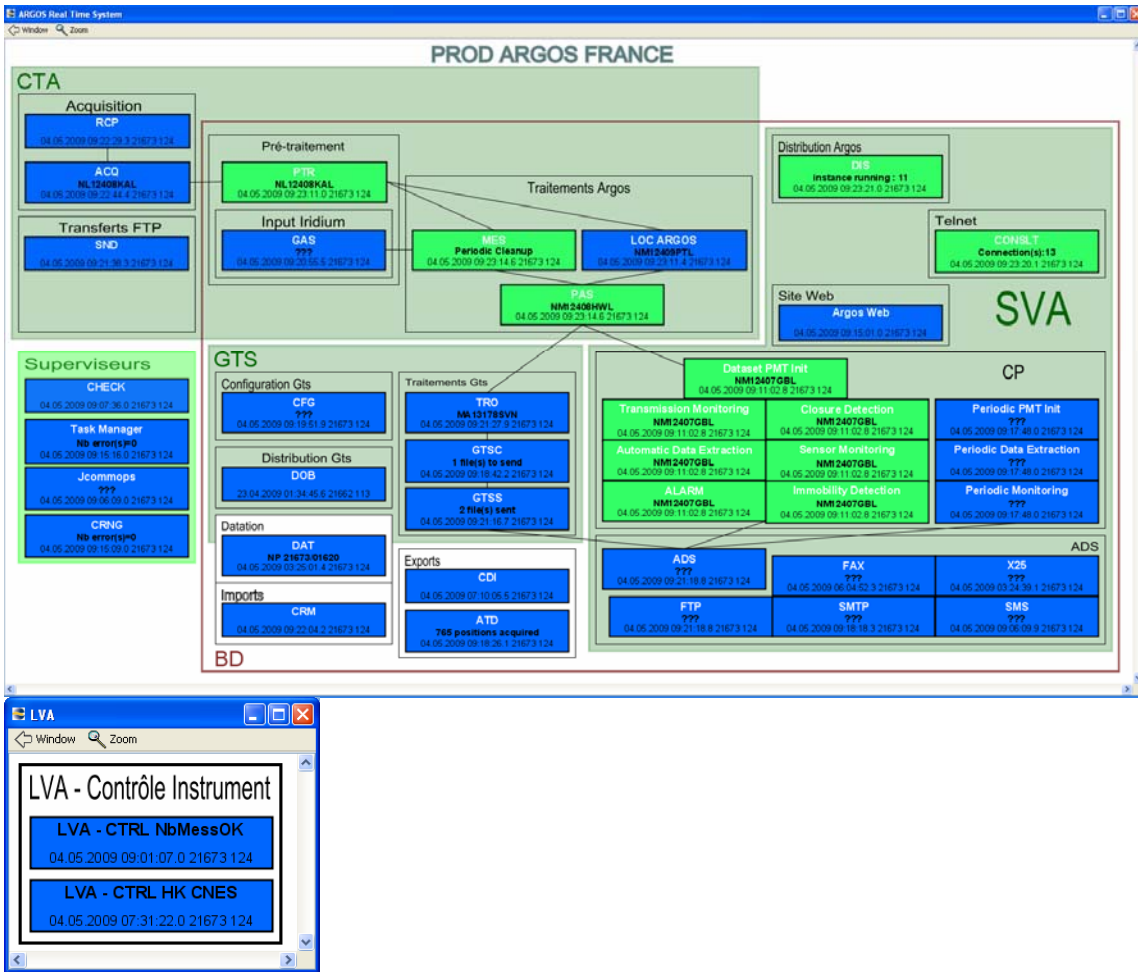


Figure 13: ARGOS Synoptic

CLS is monitoring JCOMMOPS Web Services and its computer architecture since December 2007.

Redundancy was used at least twice a month during 2008. Redundancy means all Argos users were rerouted to CLS or CLSA during an anomaly on the nominal GPC.

### 3.6. Regional Processing Centers



**Figure 14: CLS Peru Regional Processing Center**

Lima (Peru) center was nominal over 2008. All Argos architecture will be replaced at the end of 2009.

## ***4. Communication links***

CLS has improved his Internet link and are now connected each other to 2 different providers: Two lines (10M each) with Bandwidth Tunneling by application.

Internet is still the main communication link used to distribute processed data to users and to retrieve data sets from receiving stations. Security functionalities are available SSH, PGP, HTTPS.

The X25 protocol is only used and maintained by the Toulouse center to send data to a few users (less than 20) concerned by security reasons.

## 5. Statistics

### 5.1. Daily and Monthly Active PTT

The number of Argos platforms operating continues to increase. In June 2008, more than 10400 platforms were seen on average per day. Each of the two global centers processed data from 18 500 individual platforms during this month.

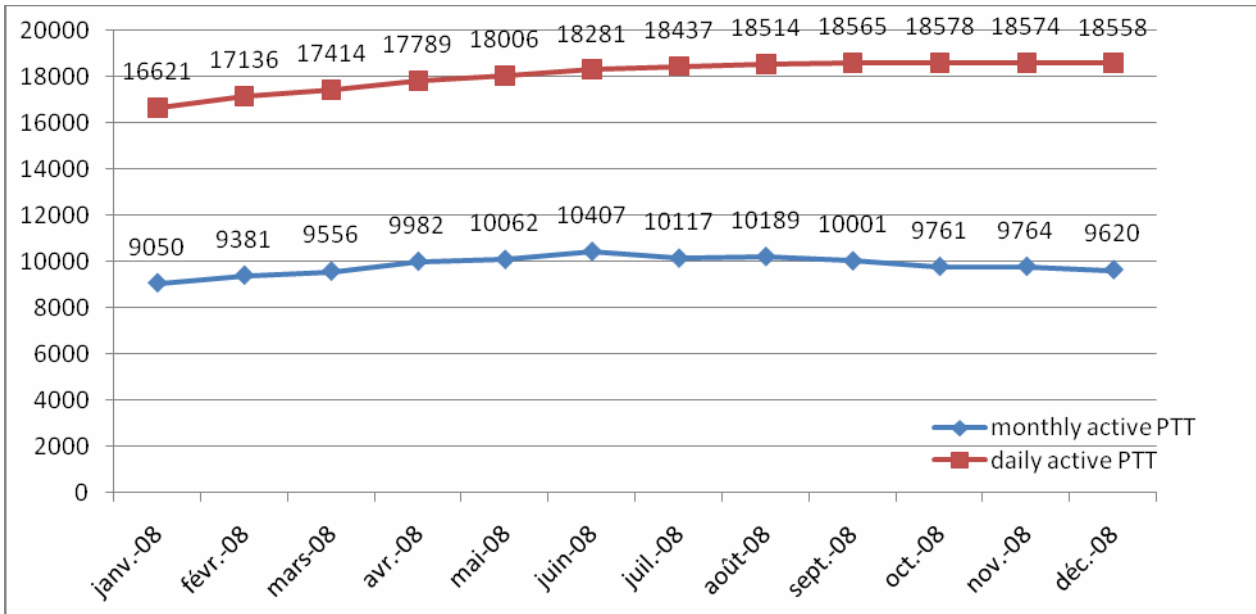


Figure 15: Daily and Monthly Active PTT in 2008

### 5.2. TELNET access

35000 average connections per day on TELNET (in CLS). This number is increasing compare to 2007 (32000) and to 2006 (30000).

20000 average connections per day on TELNET (in CLS America, Inc.)

### 5.3. ArgosWeb access

150 average connections per day on ARGOSWEB. 100 average connections per day over the week-end.

### 5.4. ARGOS Messages

Number of locations and messages computed every day by the Largo and Toulouse Centers are, in average:

Items per day	2007	2008
Messages received	1 957 500	1 969 658
Distinct Messages received	972 000	1 164 717
Argos Locations	66 750	66 176
GPS Locations	163 150	187 829

### 5.5. Access availability

The average availability is 99,39 % in 2008. During the unavailability of the services in CLS, CLS America, Inc. was on backup.

June and July were impacted by database server crashes.

December was impacted by CLS Firewall problem.

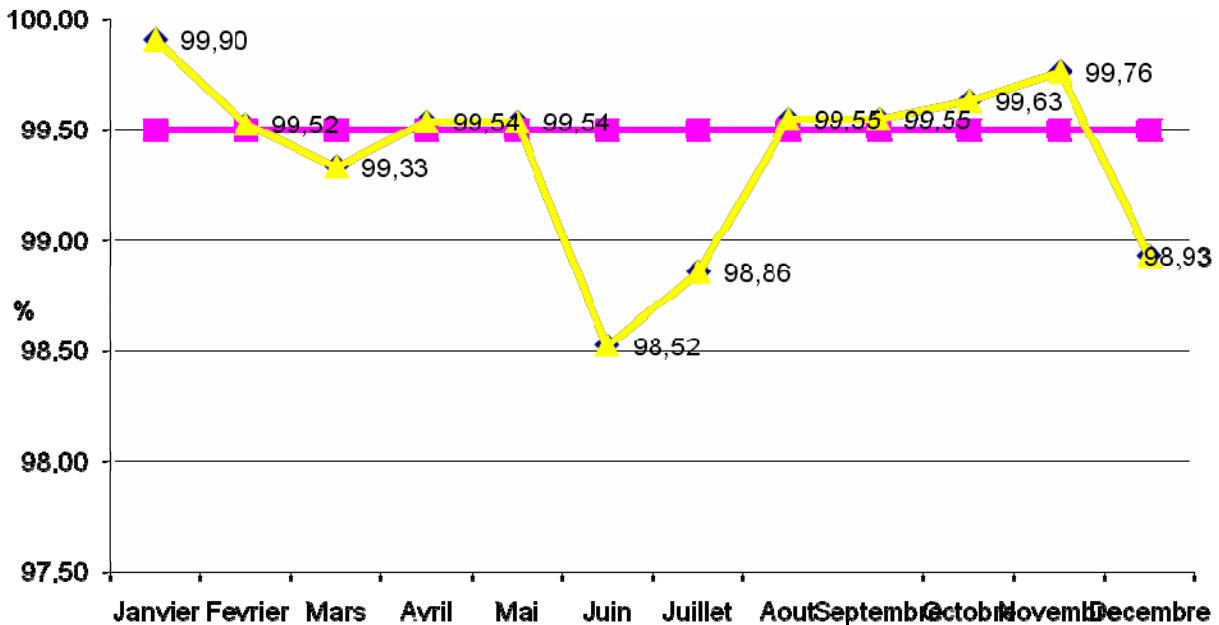


Figure 16: ARGOS Processing Chain availability

No major anomalies have impacted the ARGOS data availability.

## **5.6. 2009-2010 Perspectives**

- Two ARGOS3 instrument (Downlink) into operation
  - Implementation of METOP compatible network of LUT antennas
  - NOAA N Prime delivered to all ARGOS users on August 3rd, 2009
  - 3 New antennas with EARS network
  - ARGOS3 (Downlink) into operation
  - Improving delivery times
  - Argos system monitoring : implementation of a reference platforms network
  - Disaster Recovery implementation
  - Implementation of observation processing (delivery of physical values)
  - A new XML format of distribution
  - Web services and new distribution formats
  - Improvements on ArgosWeb (more days of locations available, Implementation of program activity and Unused ID reports, ...)
  - Alarms and Alert A2001 compatible
  - Downlink Messaging Monitoring Center upgrade and related web interface
  - GTS Subsystem adjustments and developments (open action item)
  - Successful launch of NOAA N Prime (February 2009) with an Argos-3 instrument
  - Implementation of GDOP in Argos Location calculation for better estimation of location accuracy
  - New Argos location algorithm for applications running under harsh conditions (animal tracking for instance)
  - Argos ID on 6 digits
-

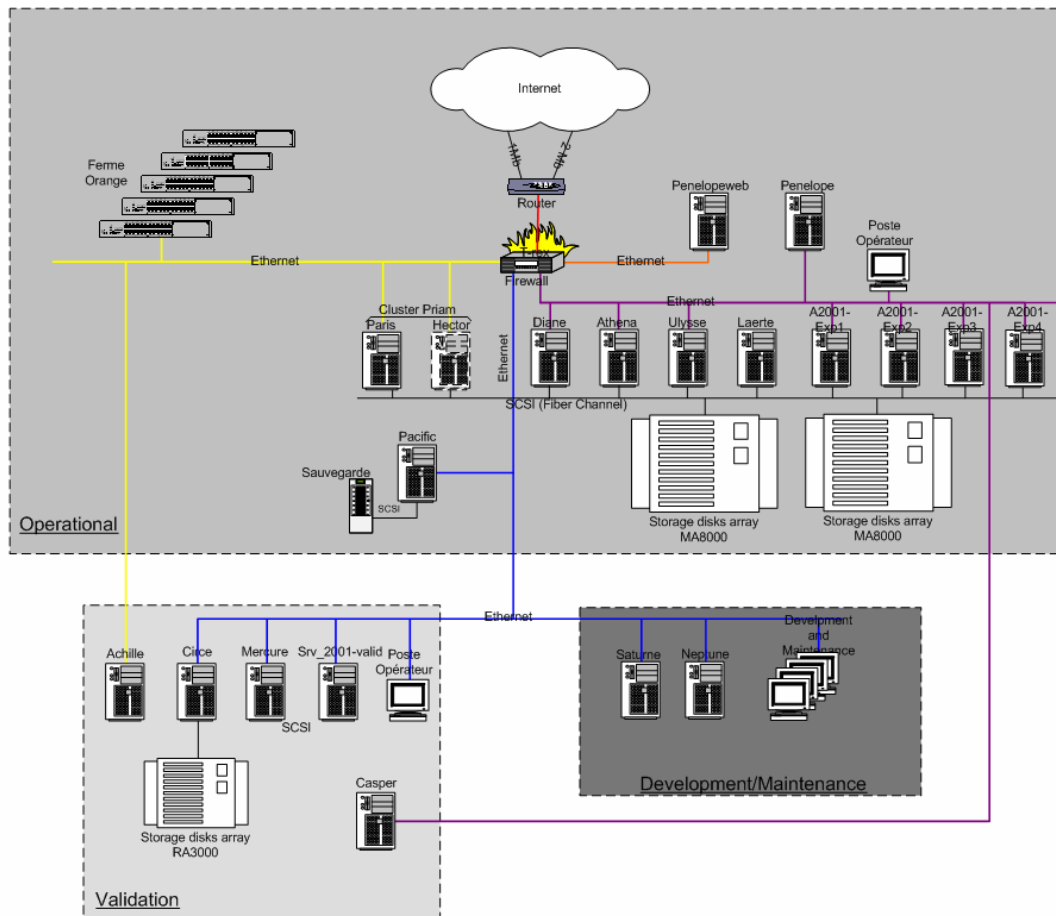
## ANNEX V

### 2008-2009 SYSTEM IMPROVEMENTS

#### 1. Processing improvements

##### 1.1. Hardware configuration

The computing architecture dedicated to the Argos system is steady. A few words to recall the principle of the Argos computing centre architecture.



In the middle of the architecture, there are two high performance SAN disk storage arrays on which are connected, via fiber channel links, the servers involved in the processing of the Argos data.

The operational configuration is dedicated to the acquisition, the processing and the dissemination of the Argos data, 24 hours a day, all along the year. In 2008, all the old OpenVMS servers, which still existed, have been discarded. Today, it means that all the Argos servers run on Linux and Windows (a few).

The development and the maintenance of the Argos software are performed on a dedicated architecture. The third configuration, the validation configuration, is used to validate all the software modifications and corrections before being installed at the level of the operational configuration.



## **1.2. Argos Control and processing centre**

The project Argos 2001, which consisted in renewing all the hardware and software components of the Argos Control and Processing centres, is now finished. The purpose of the Argos 2001 project was vital for the long-term continuity of the Argos system in order to offer a better level of services to our users in terms of new functionalities, reliability, availability and responsiveness to their requests.

## **1.3. GTS processing enhancements**

Here, the list of GTS enhancements done in 2008 and 2009:

- Implementation of a GTS processing monitoring tool
- Development of software modules to GTS process University of Wisconsin AWS Stations (24 new weather fixed stations are now processed).
- GTS processing improvements:
  - Filtering of all default GPS locations (0;0 or 90;0 ...)
  - Automatic switch on Argos location when GPS is failed.
  - The sending period of GTS bulletins to Météo-France/NWS has been improved: 2 min instead of 5 min.
- Development of a software module to process SBD ASCII Iridium messages in the GTS Iridium data processing for IPP (only SBD format) with a gateway between CLS Iridium chain and Argos-GTS system.
- Implementation of BUFR codes for TESAC and SHIP bulletins. Next step BUFR for SYNOP.

## 2. Ground Segment improvements

### 2.1. Ground segment architecture

The Argos ground segment is composed of:

- the global acquisition network
- the real time acquisition network
- the orbitography network
- the Global Argos Control and Processing centre
- the regional processing centers
- the PTTs and PMTs

### 2.2. The global mode acquisition network

It is composed of the two NOAA global stations (Fairbanks, Wallops Island) for the acquisition of the NOAA satellites data and the Eumetsat antenna (Svalbard) for the acquisition of the MetOp and NOAA-18 data.

### 2.3. The real time acquisition network

4 stations were added to the Argos network in 2009. With 56 stations in operation, this network provides a very good coverage of the earth. For DBCP needs, it is important to enhance the coverage of the south part of the Indian Ocean as well as the middle of the Atlantic Ocean. These are very remote areas where it is difficult to find sites and infrastructures. The possibility of using the site of St Helena has been abandoned (no band-L station exists and very poor communication links). Contacts were made to check if any antennas operated by US Navy were available in Diego Garcia or other islands in same area. Unfortunately, such capability doesn't exist.



Argos real time acquisition network

Most of the ground stations which compose the Argos network are only capable of acquiring data from NOAA satellites. This is the reason why we wanted to focus our efforts on adding new ground stations compatible with NOAA and METOP satellites.

In July 2007, the failure of METOP-A HRPT transmitter stopped the implementation of this network. Despite the restart of the transmitter over the North Atlantic in 2008, the ground stations owners decided not to invest in the upgrade of their station. CLS bought and installed two NOAA/METOP stations (Lima, Hatoyama) which are only used, for the time being, for the NOAA satellites.

To prepare the future, CLS has continued to negotiate with Eumetsat in order to be connected to the EARS network. This connection is effective since March 2009. On another side, CLS initiated, with the help and the cooperation of CNES, the upgrade of the Argos ground stations network so that a part of the stations can acquire data issued from NOAA, METOP, SARAL and NPOESS satellites. The network must be dense enough to deliver data to users as rapidly as possible.

A number of tasks must be completed to develop a ground station network that meets the above criteria.

#### 1. System design studies and engineering

- Studying the existing network
- Identifying applications where data delivery time is a particularly sensitive issue
- Identifying geographical areas requiring priority coverage
- Defining the optimum network to be set up to meet requirements
- Defining the station network upgrade strategy
- Identifying stations qualifying for upgrade
- Studying these stations (in terms of upgradability)
- Conducting negotiations with the owners of these stations.

#### 2. NOAA/METOP/SARAL/NPOESS receiver development

- Taking the CNES feasibility study and making any necessary adjustments
- Selecting the upgrading contractor
- Negotiating the upgrading contract
- Monitoring upgrading work
- Conducting test, validation and acceptance activities.

#### 3. Upgrading the three CLS stations ("Konsberg")

- Implementing the new receiver
- Implementing the new station control software
- Conducting test, validation and acceptance activities.

#### 4. Upgrading non-CLS stations (about eight)

- Eight is an approximate figure and must be confirmed during the first-phase system study.
- This activity comprises the following tasks:
  - ✓ Procuring a receiver
  - ✓ Upgrading the station control software

- ✓ Implementing the new receiver
- ✓ Implementing the station control software
- ✓ Conducting test, validation and acceptance activities.

5. Procuring and installing new ground stations (around two)

- Two is an approximate figure and must be confirmed during the first-phase system study. The new stations, which will join the existing network, will be installed in spots where they are most likely to improve performance for users (geographical coverage, density of beacons in area, real-time advantages, etc.)
- Issuing the invitation to tender, selecting the contractor and negotiating station procurement contracts
- Preparing installation sites
- Installing the stations
- Conducting test, validation and acceptance activities.

A CLS-led project incorporating tasks 1, 2 and 3 described above was started in May 2009 and should be completed by July 2010. A detailed review and in-depth examination of operating feedback will then be carried out before commencing tasks 4 and 5, which are scheduled for completion in time for the launch of SARAL. We will then have a network of stations capable of handling NOAA, METOP, SARAL and NPOESS satellite data.

## **2.4. PTT/PMT for users**

The Argos-3 instrument generation allows users to benefit from two-way communications as well as larger data bandwidth. To access these new capabilities, user platforms need to integrate a PMT (Platform Message Transceiver) in place of their current PTT.

The PMT module, working as a modem, supports:

- ✓ Transmission of uplink messages using several possible modulation links as well as satellite pass predictions
- ✓ Reception and processing of downlink messages (commands, predefined messages, satellite acknowledgement,...).
- ✓ Communication with the platform for the acquisition of sensors and the delivery of an acknowledgement when data string has been correctly transmitted and acknowledged by satellites.

Today, two manufacturers, Kenwood and Elta, successfully fulfilled the certification process and delivered their final product version in December 2007. This development has reached its goals in terms of product definition and constraints (size, consumption,...) as well as on costs.

The first 500 Kenwood PMT units have been received by CLS in May 2008.

In order to convince users and manufacturers to use these PMTs and the Argos-3 functionalities, it has been decided, with the help and the cooperation of CNES, to create an Argos-3 implementation plan.



**Elta PMT RFM**



**Kenwood PMT RFM**

The objectives of this project are to:

- ✓ Enhance knowledge and control of the Argos-3 system
- ✓ Promote the Argos-3 system

In terms of organization, the project was split in two distinct and consecutive phases.

A first phase, called Evaluation phase, intended for:

- enhancing knowledge and control of the system through the deployment of a network of Argos-3 reference platforms
- listing the advantages and the constraints of the system, from a user point of view,
- gathering all the elements needed to promote the system
- developing Argos-3 platforms prototypes which are representative of the user applications in order to validate optimized usage scenario of transmission and take advantage of the new Argos-3 functionalities

A second phase, called Promotion phase, intended for:

- raising awareness, encouraging, involving and convincing users and manufacturers to use the Argos-3 system
- developing, from the return of experience obtained with the Argos-3 platform prototypes, operational user platforms (Argo floats, drifting buoys, animal platforms). This involves development contracts signed with manufacturers.
- making these platforms available for the users in order to include them in pilot projects
- following up these Argos-3 platforms during a significant period (about 9 months) and comparing their performance with the Argos-2 ones of the same program
- organizing an Argos-3 forum where will be presented to the Argos user community the results of the promotion phase.

First phase is almost completed while the second phase is now taking shape and should be significantly developed by the end of 2009.

## 2.5. Argos-3 & PMT CLS implementation projects

The following paragraphs provide an insight of the Argos-3 projects carried out in the different metocean applications in addition to the DBCP Argos-3 Pilot Project.

### ➤ TRITON/JAMSTEC moored buoys

The first Argos-3 TRITON buoy was deployed last March in the eastern Indian Ocean from the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) research vessel KAIYO during its cruise from March 10 to 31, 2009. JAMSTEC integrated the Argos-3 PMT modem into an m-TRITON moored buoy. The buoy uses the Argos-3 high data rate uplink and interactive data collection mode. It has sent 27.6 Ko of data per day without any loss and error free, thus collecting 15.3 times more than a classical TRITON buoy equipped with an Argos-2 transmitter. In addition, energy consumption has been divided by 6 as the PMT is synchronized with the satellite and messages are transmitted only during satellite passes. These first results are very promising as the Argos-3 TRITON proves to be low power consumption and more efficient in data collection and transmission.

Parameters	TRITON buoy with Argos-3	TRITON buoy with Argos-2
Repetition of a message	1.4	72
Max length of a message	4 608 bits	248 bits
Transmission power output	5W	1W
Collected data per day	27.6 kbytes	1.78 kbytes
Data sampling	10 minutes	60 minutes



Deployment of the Argos-3 m-TRITON buoy by JAMSTEC

### ➤ ICCM: Moored buoy in the Canary Islands

The Marine Science Institute of the Canaries in Spain (Instituto Canario de Ciencias Marinas – ICCM) has integrated a PMT into a moored buoy for real time monitoring of meteorological and oceanographic parameters for long-time series in open ocean at the ESTOC site (European Station for Time Series in the Ocean at the Canary Islands) under the framework of -Red ACOMAR Canarias- and -EUROSITES- projects. The European program EUROSITES is coordinated by the National Oceanography Centre (Southampton, UK) and involves 13 partners across Europe and the Cape Verde Islands. The aim of the program is to form an integrated European network of deep ocean (>1000 m) observatories in order to have a better understanding of the impact of the changing global Ocean and Earth on mankind and ecosystems at large. A second buoy with Argos-3 is planned for this fall.



**Moored buoy equipped with a PMT modem in the Canary Islands**

➤ **TANGO/Drifter deployment by IMEDEA**

On July 23<sup>rd</sup>, IMEDEA (Mediterranean Institute for Advanced Studies) deployed two Argos-3 SVPB manufactured by Clearwater within the framework of the European project TANGO. The deployment took place in the south of Majorca in the Mediterranean Sea.



**Deployment of Argos-3 drifter by IMEDEA**

Unfortunately one of the buoys was lost a few days after the deployment, probably hit by a boat while the other SVPB buoy could send its positions and data during two weeks before being picked up by a fisherman near Cala Figuera harbor. The little time those two buoys were at sea could not provide enough results for us to evaluate the Argos-3 system. However IMEDEA managed to recover one of the SVPB-G buoys and plan to deploy it again next September.

➤ **CO2 Buoys/JAMSTEC**

The Japan Agency for Marine-Earth Science and Technology (JAMSTEC) is currently developing an Argos-3 drifter with CO<sub>2</sub> sensors. The objective is to provide simplified and automated measurements of pCO<sub>2</sub> over all the world's oceans in order to understand the consequences of the climate change on the oceans. Thanks to the new Argos-3 capabilities, JAMSTEC will be able to measure pCO<sub>2</sub> in seawater anytime they want by simply sending a command to the PMT. This will thus allow JAMSTEC to remotely manage the sampling according to the places where the buoy is. In addition Argos-3 capabilities will help optimize data transmission to satellites and therefore extend the buoy lifetime thanks to the Argos-3 interactive data collection mode. The first deployments are expected by the end of 2009.



**Dr Nakano with a small drifting buoy with CO2 sensors**

➤ **ARGO floats**

Within the Argo program, float manufacturers started to integrate the Argos-3 PMT into their platforms. Ifremer and NKE made good progress and proceeded to the first Argos-3 tests for the ARVOR float. A dual frequency antenna (401 and 466 MHz) was developed and the work is now focused on the transmission strategies with the objectives of:

- ✓ Staying less than 45 minutes at the surface
- ✓ Being able to program the arrival time at the surface
- ✓ Transmit a full Argo profile (T,S,P) in one Argos-3 satellite pass (15 minutes)
- ✓ Compute a “good” Doppler Argos location (class 3 or 2)
- ✓ Receive downlink messages such as the PMT positions, system broadcasts and user commands

German float manufacturer Optimare has already integrated the PMT modem into their NEMO floats. They are currently using it as an Argos-2 transmitter. The next step will be the implementation of Argos-3 capabilities which could start in 2010.



**PMT integrated into a NEMO float**

Finally the University of Washington is working closely with CLS on the integration of Argos-3 into Apex floats. The Webb Apex antenna is Argos-3 dual band compatible. In parallel,



SCRIPPS (SOLO floats) should soon implement the Argos-3 high data rate solution within their SOLO-2 floats.

✓ **LEGOS: Tracking a glacier in Antarctica**

A project of ice thawing monitoring was initiated with the LEGOS at the end of 2008, further to the announcement of an imminent parceling of a glacier in Antarctica. This application was an opportunity for the CLS technical support team to get familiar with the Kenwood PMT. The project foresaw the installation of about ten GPS stations along the break line to study its evolution. Some PMTs were integrated in order to transmit GPS positions via the Argos system.

Unfortunately the project was postponed to October 2009 due to harsh meteorological conditions and ship engine breakdown. The deployment of 4 stations is planned for this summer 2009.

### 3. DBCP Requirements

#### 3.1. Monitoring Data Timeliness

*“To offer solutions for improving data timeliness and to develop data timeliness and to develop monitoring tools” (5.2)*

Data timeliness depends on:

- The number of satellites,
- The real time antenna network and the performance of each antenna
- The recovery of the global dataset at each orbit (elimination of blind orbits)
- Ultimately, the data processing time.

#### Monitoring system time response

Delivery times are now closely monitored with the new processing system implemented at the end of June 08.

#### Global delivery times

The next table shows the throughput time for the global datasets result delivery from NOAA-18, NOAA-17, NOAA-16 and NOAA-15 in July 2009:

Satellite delivery	2009	2008
< 1 h	21%	18%
< 1 h 30	38%	37%
< 2 h	58%	58%
< 2 h 30	73%	77%
< 4 h	91%	91%

**Stored data availability for NOAA-18, -17, -16 and -15**

The throughput time for stored data result delivery from MetOp-A:

Satellite delivery	2009	2008
< 2 h	26%	25%
< 2 h 30	50%	50%
< 4 h	99%	99%

Stored data availability for MetOp-A

### Real time datasets

Next table shows the throughput time for real-time delivery from NOAA-18, NOAA-17, NOAA-16 and NOAA-15 in July 2009:

Satellite delivery	July 2009	August 2008
< 10 minutes	19%	12%
< 15 minutes	54%	42%
< 30 minutes	93%	87%
< 45 minutes	97%	91%

Real-time data availability

The CLS and Argos real time antennas partnerships efforts are rewarded by a visible improvement of the real time data availability.

### Monitoring by platform types

In 2009 CLS developed a GTS processing monitoring tool; the following statistics are computed each day:

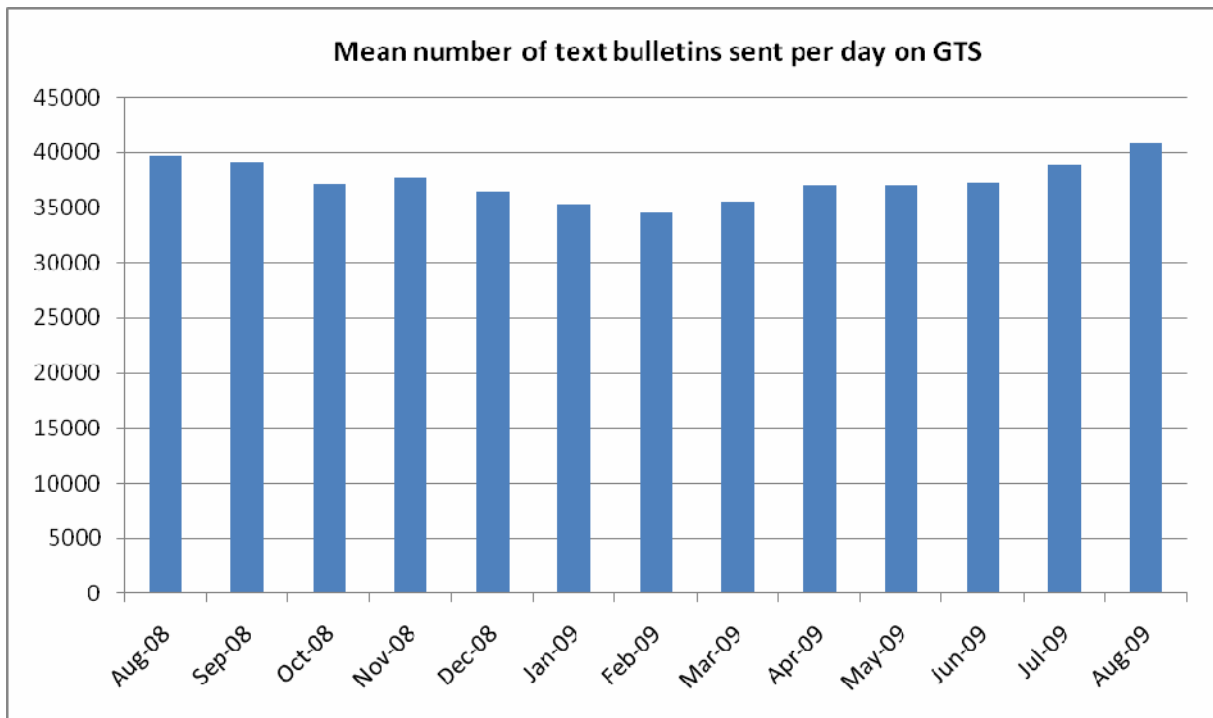
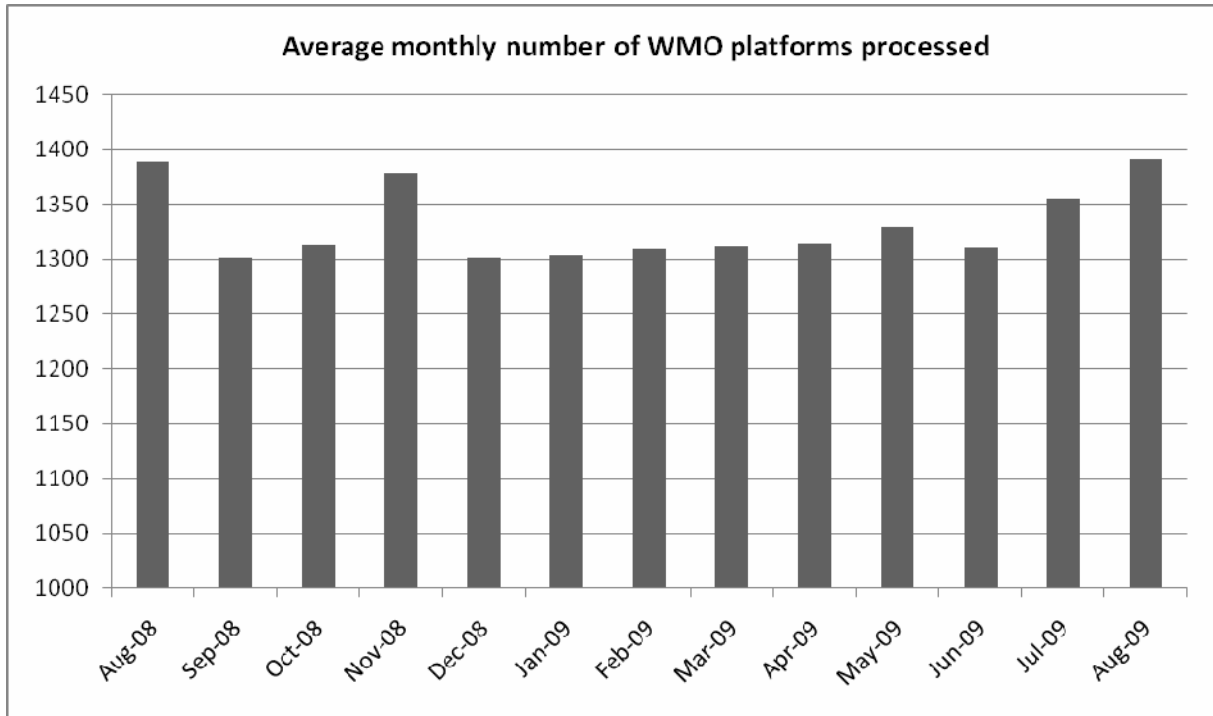
- ✓ Number of GTS platforms (with a WMO id) processed,
- ✓ Number of observations processed,
- ✓ Average disposition time (observation time – sending time on the GTS)

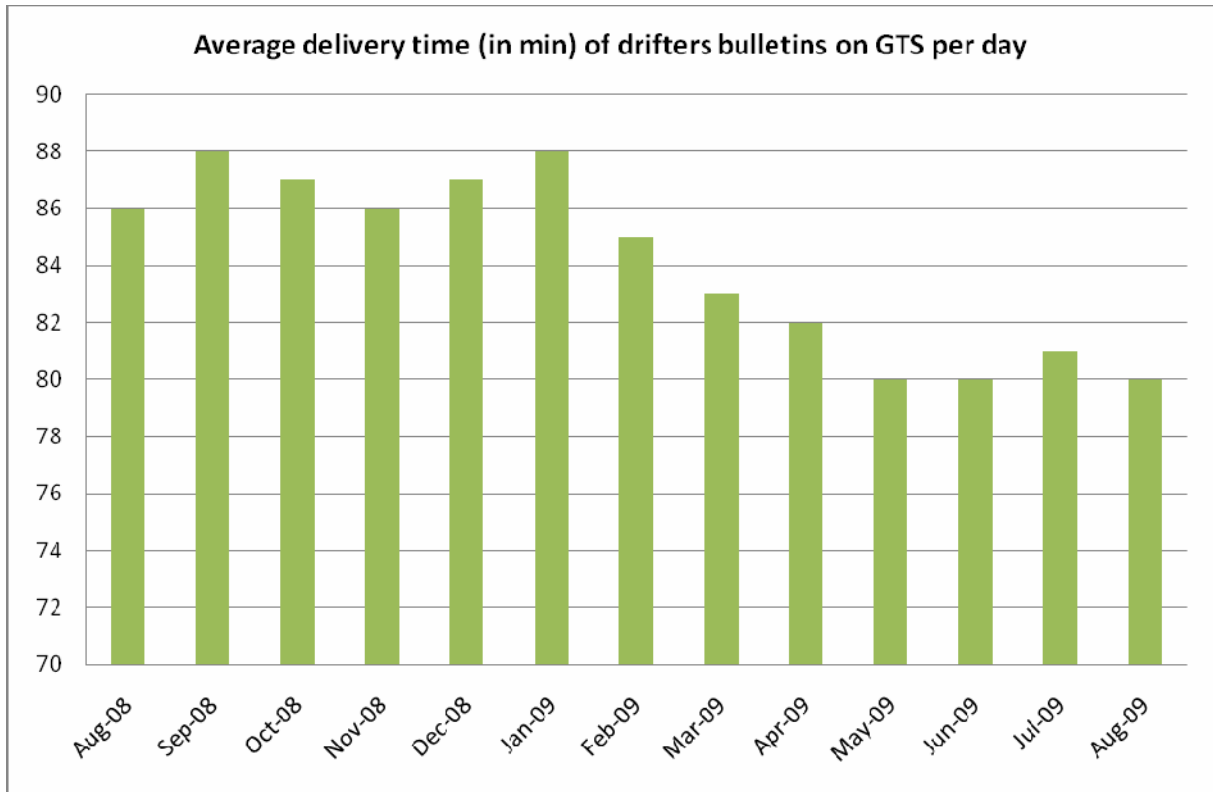
These 3 numbers are provided for:

- ✓ All types of bulletins
- ✓ Each type of text bulletins (BUOY, SHIP, TESAC, and SYNOP)
- ✓ Each type of buoy (ATLAS, DRIFTERS, ICE, OTHERS, and TRITON).

Next step: Provide statistics on operational GTS monitoring tool by ocean basin on 2010.

Following graphs present some example of statistics produced by this tool.





Average delivery time of GTS bulletins has been improved in 2009 with improvements in processing chain listed in previous chapter of this document: *GTS processing enhancements*.

### Monitoring antenna network performance

*“To develop further the tool regarding status of local receiving stations (percentage of time they are operational) so that to display additional information such as what operational satellites are being received via each station.” 5.10-iv*

Delivery times are affected primarily by the coverage and the performance of each real time receiving station.

Table below displays the antenna performance characteristics:

Name	City	Country	Antenna	# satellites processed	% datasets received/expected	Mean dataset availability at CLS	Comments
AN	Andersen	USA	CLS	3	61	00:22:39	Software problems between February and May 09
AT	Athens	GREECE	CLS	4	37	00:15:31	Electrical problems during the year
AU	Aussaguel	FRANCE	CLS	4	33	00:26:13	Problem of connection

							since June 09
BA	Buenos Aires	ARGENTINA	INTA	3	24	00:23:44	Frequent connection problems
BL	Bali	INDONESIA	PT CLS	4	25	00:20:21	Hardware problem
CA	Casey	AUSTRALIA	BOM	4	20	00:22:03	No data from January to June 09
CF	Cape Ferguson	AUSTRALIA	NOAA	5	62	01:01:52	
CH	Santiago	CHILE	Meteo Chile	2	63	00:29:00	No data from Mars to July 09
CN	Las Palmas	SPAIN	CLS	4	14	00:17:23	Computer problem from December 08 to August 09
CY	Cayenne	FRANCE	IRD	3	34	00:56:15	
DA	Darwin	AUSTRALIA	BOM	4	59	00:18:45	
DV	Davis	AUSTRALIA	BOM	4	65	00:21:12	
ED	Edmonton	CANADA	Envir. Canada	4	69	00:12:10	
EL	Elmendorf - Anchorage	USA	CLS	4	18	00:32:10	Server transfer in progress since May 09 on USAF stations
FI	Fiji	FIJI	CLS	3	83	00:21:05	
GB	Libreville - N Koltang	GABON	CNES/CLS	4	51	00:19:00	
GC	Gilmore Creek	USA	NOAA/NES DIS	4	63	00:17:52	
GR	Sondre	GREENLAND	DMI	4	70	00:14:08	
HF	Halifax	CANADA	Can. Coast Guard	3	76	01:02:29	
HI	Hickam - Honolulu	USA	CLS	3	56	00:25:09	Server transfer in progress since May 09 on USAF stations
HT	Hatoyama	JAPAN	JAXA/EOC	4	43	00:11:04	Antenna problem since May 09
HW	Hawaïi	USA	NOAA/NWS	4	40	00:32:54	Server transfer in progress since May 09 on USAF stations
HY	Hyderabad	INDIA	INCOIS	3	52	02:29:54	Antenna problem

JM	Jamstec - Tokyo	JAPAN	Jamstec	4	43	00:15:15	<b>Problem update 2lines with NP satellite from February to May 09</b>
KA	Kandena-Okinawa	JAPAN	CLS	4	48	00:27:54	
LM	Lima	PERU	CLS Perou	4	67	00:13:02	
LP	Las Palmas	SPAIN	Univ. Las Palmas	4	43	00:43:32	
MA	Miami	USA	NOAA/AOM L	4	70	00:42:37	
ME	Melbourne	AUSTRALIA	BOM	5	68	00:20:57	
MO	Monterey	USA	US Navy /NWS	2	71	00:31:38	
NC	Nouméa	NEW CALEDONIA	Meteo France	3	0		<b>PC problem since July 2008</b>
NO	Nouméa	FRANCE	IRD	3	42	00:49:36	
NZ	Wellington	NEW ZEALAND	Met Office	4	49	00:25:15	
OS	Oslo	NORWAY	NMI	2	28	00:15:19	
PE	Perth	AUSTRALIA	BOM	4	68	00:17:00	
PR	Lima	PERU	CLS peru	4	69	00:18:22	
PT	Petropavlovsk	RUSSIA	Complex System	4	64	00:18:58	
RE	Reunion Island	FRANCE	IRD	3	36	00:40:57	
RN	Reunion Island	FRANCE	Meteo France	2	91	00:12:24	
RO	Rothera	INDONESIA	PT CLS	3	43	00:11:17	
SA	Cape Town	SOUTH AFRICA	CLS/SAWB	4	46	00:17:55	
SE	Séoul	KOREA	KMA	3	37	00:10:31	
SG	Singapore	CHINA	SMM	4	40	00:36:05	
SH	Shanghai	CHINA	East China Sea Fisheries	4	33	00:19:11	
SM	Sembach	GERMANY		3	23	00:17:47	<b>Server transfer in progress since Mars 09 on USAF stations</b>
ST	Tromsoe	NORWAY	KSAT	3	57	00:28:28	
TA	Papeete	FRANCE	IRD	3	23	01:06:22	<b>No data since December 08</b>
TW	Taiwan	TAIWAN	National Taiwan Ocean Uni	4	32	00:28:18	
UA	Valley Forge	USA	CLS	4	1	00:18:14	<b>Test station</b>

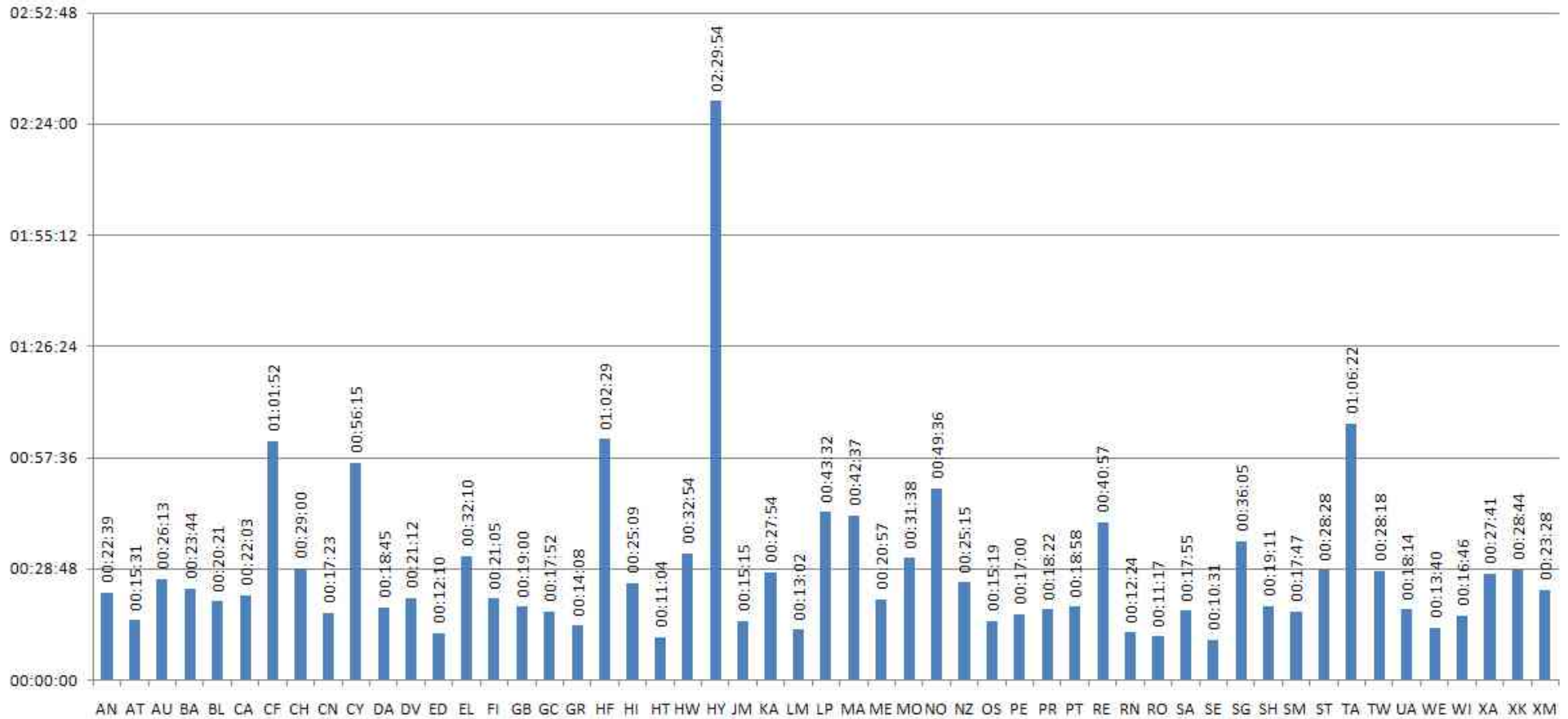
WE	Lannion	FRANCE	Meteo France	3	71	00:13:40	
WI	Wallops Island	USA	NOAA/NES DIS	4	89	00:16:46	
XA	Athens	GREECE	EARS	4	83	00:27:41	
XK	Kangerlussuaq	GROENLAND	EARS	4	65	00:28:44	
XM	Maspalomas	SPAIN	EARS	5	88	00:23:28	

**Real time receiving stations 2008-2009 performance (August-08-January09)**

Top performers are indicated in green. Explanations on poor performance are given in "comment" column when available.

Following picture shows the mean dataset availability time at CLS for each antenna of the real time network between August 2008 and July 2009:

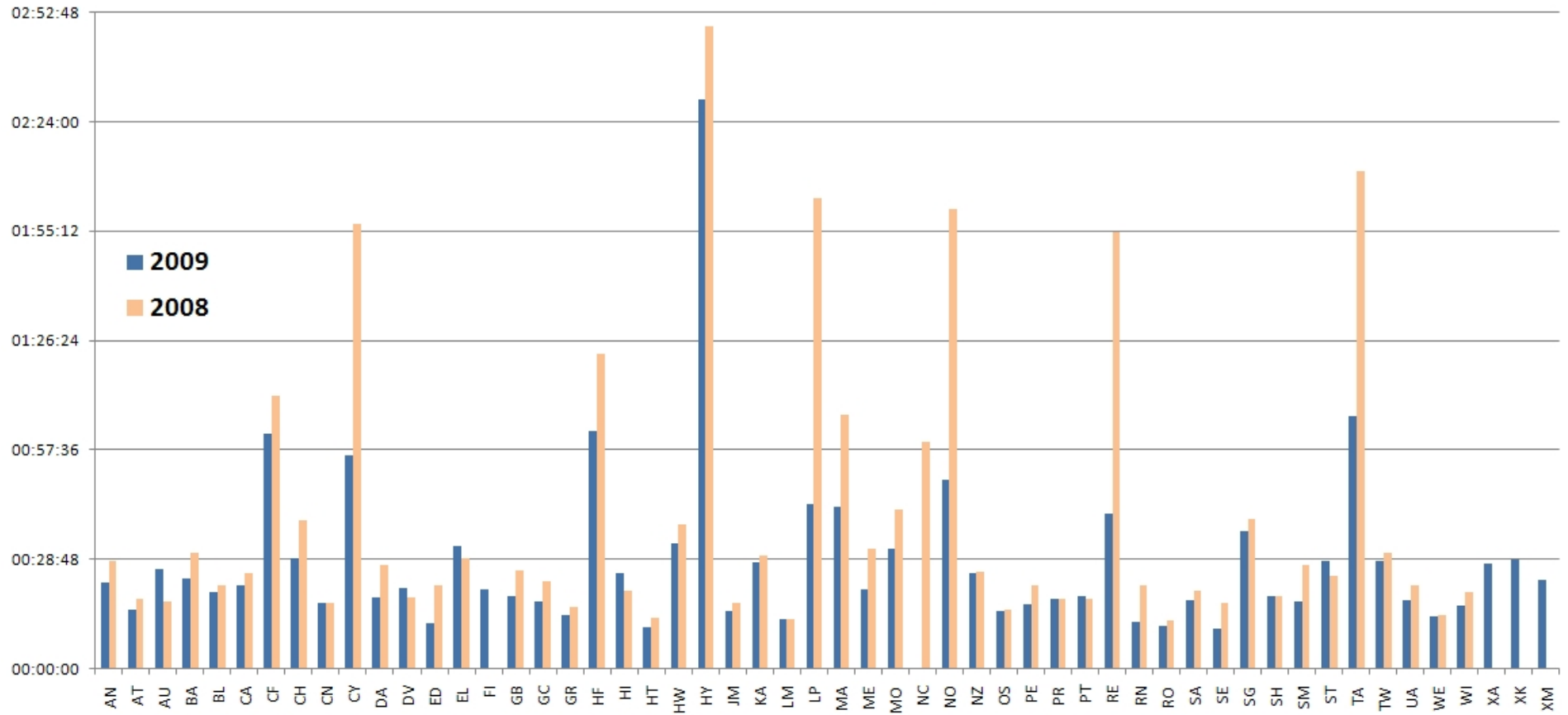
**Mean dataset availability time by Argos station between Aug08 - Jul09**





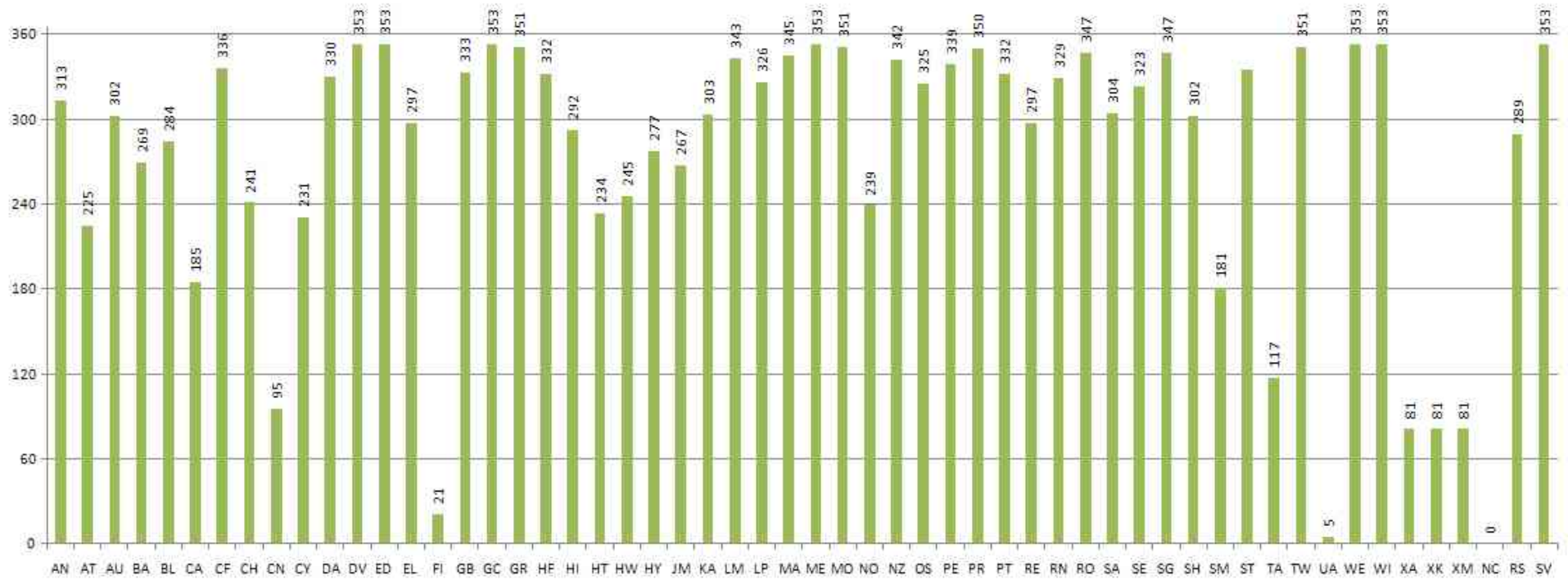
Following figure shows the improvements in term of time availability of regional dataset between 2009 and 2008:

**Improvements of mean dataset availability between 2009 and 2008**



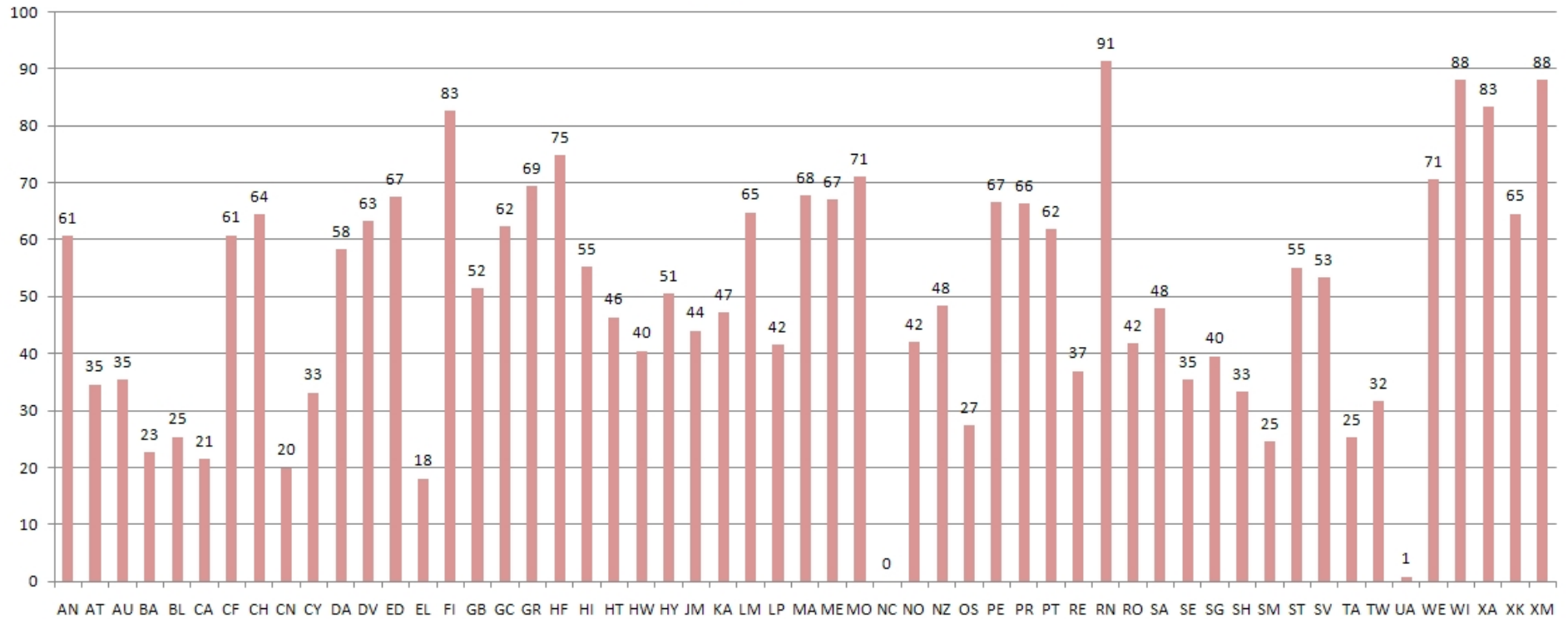
Following picture shows the number of days in operation for each Argos antenna of the real time network between August 2008 and July 2009:

**Number of days in operation by Argos station during 1 year ( Aug08-Jul09)**



Following picture shows the percentage of dataset received at CLS for each antenna of the real time network between August 2008 and July 2009:

**% of dataset received by Argos station between Aug08 - Jul09**



## **3.2. Improving data timeliness : DBCP Requirements**

### **Enhancing antenna network**

#### ***A. Report on the 'Blind Orbit Support' to the OPSCOM by Mickey Fitzmaurice (JTA-XXVIII action item n°2)***

The National Oceanic and Atmospheric Administration's (NOAA's) efforts to recover "backup" satellite's (NOAA-15, NOAA-16, NOAA-17, and NOAA-18) GAC data from the NPOESS Svalbard facility using the IJPS portals into the NOAA SOCC has been successfully demonstrated technically in 2005 and 2006. Since this time period, numerous delays in completing the effort have occurred due to the effort's reduced priority internal to the NOAA SOCC. The launch and activation of MetOp, the incorporation of Jason-2 into the NOAA SOCC, the preparation, launch and checkout of NOAA N-Prime all were higher priority efforts that delayed the blind orbit support effort. During the delay period, the automation of the data recovery effort, which required extensive modifications to the Polar program's scheduling software was completed and validated. With the successful launch of N-Prime a more extensive evaluation of the NPOESS blind orbit data recovery effort's impacts to primary satellite's (NOAA-19 and MetOp) GAC recovery from the IJPS Svalbard facility needs to be undertaken. This evaluation was mandated by NOAA's Polar Program manager in an effort to quantify the risks to operational data recovery from the IJPS Svalbard facility. Due to the current 6 satellite constellation, conflicts in ground station resources, especially at Fairbanks, could become an operational issue resulting in reduced data recovery. The checkout, validation and use of the NPOESS Svalbard facility would alleviate many of the conflict issues.

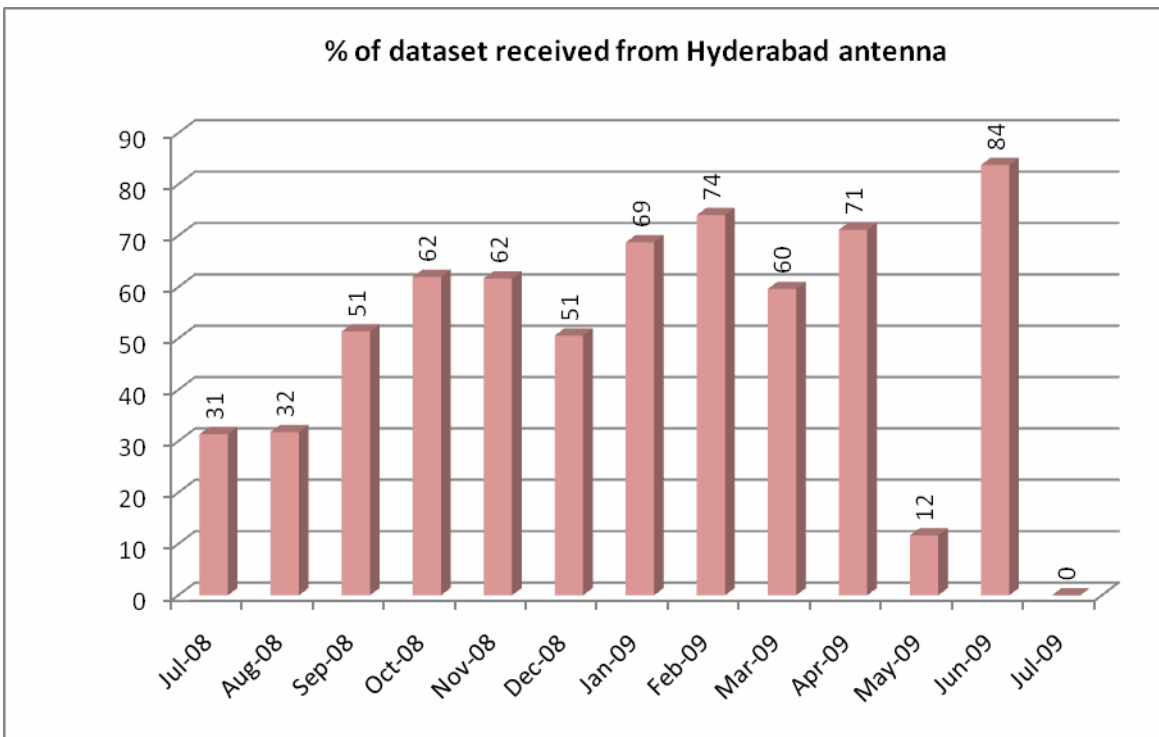
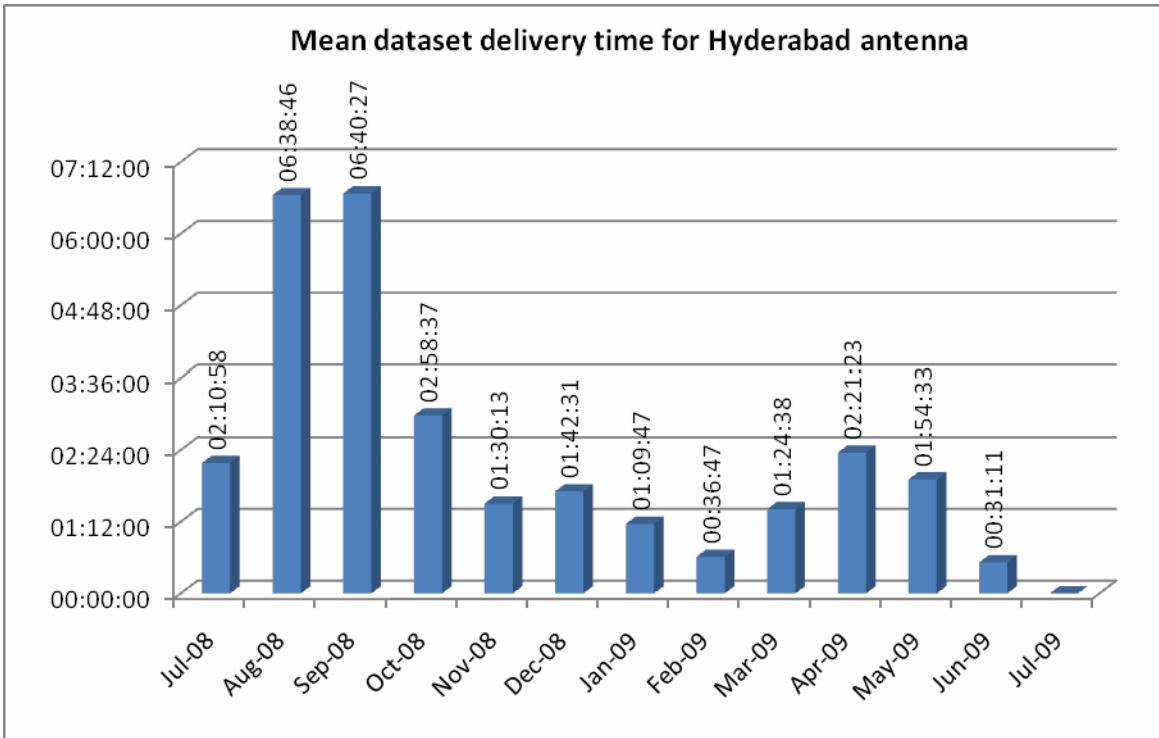
#### ***B. To pursue negotiation for the installation of new antennas to cover South Atlantic and Indian Ocean regions (JTA-XXVIII action item n°3)***

4 stations joined the Argos network during 2009 (Fiji, Athens, Greenland, Spain). There's a need to complete the Indian Ocean network.

In 2008 and 2009, CLS worked with SAWS to install antennas in Gough and Marion islands, and also upgrade the Cape Town one. CLS proposed to provide the third antenna if SAWS buys the first two. Unfortunately, because of budget restrictions, SAWS could not move forward in 2009, so there's no progress for 2009 on this matter

#### ***C. Enhance Hyderabad LUT station performance (JTA-XXVIII action item n°4)***

Cooperation was built in 2008 between CLS and INCOIS to enhance Hyderabad LUT station performance. However some software and antenna problems met by INCOIS caused some delays on data delivery. The following figures present the average time response and % of datasets received from Hyderabad from July 2008 to July 2009.



Since July 09 no data received from Hyderabad station due to an antenna problem.

**D. Ensure data from NOAA-15, 16, 17 and 18 are being received by IRD and MétéoFrance stations at la Réunion (JTA-XXVIII action item n°5)**

Currently 3 NOAA satellites (N15, N17, N18) are received by the IRD antenna and 2 NOAA satellites (N17, and now N19) by the Météo-France antenna. The Météo-France antenna has the

best performance with 91% of datasets received vs. expected, but it receives data from a fewer number of satellites – only N17 until N19 was declared operational.

***E. Investigate on existing antennas in the Indian Ocean and study other possibilities to add antennas in the Indian Ocean ideally in central Indian Ocean (JTA-XXVIII action items n°6 and 7)***

**AND**

***Reduce the delays regarding the Indian Ocean and to inform the Panel on how well the region will be served by Argos-3 (DBCP-XXIV Action, Ref. 8.4(iv))***

We have discovered this year that there are no existing U.S. Navy antennas anywhere in the Indian Ocean region. The Navy has essentially abandoned their Diego Garcia Base so there are no opportunities for antenna partnerships in the region with them. Consequently CLS has abandoned plans to locate existing antennas and is now concentrating on exploring islands which have the possibility of supporting a regional antenna technically, politically and financially.

In this context, a new project was launched (see Section 2.2 above) in 2009 with CNES with the aim to replace antennas in the existing Argos real-time network with antennas compatible with Argos-3 (NOAA & MetOp) + SARAL (Satellite with Argos and Altika) + Argos-4. Within this project, in view of the DBCP requirements, the first antenna is to be installed in the Indian Ocean. This could be done possibly by upgrading the station(s) at Reunion and/or Hyderabad as well as installing an antenna in a new location. There are very few suitable islands in the area though, especially in the central Indian Ocean. CLS is currently looking at the Seychelles, Socotra and the Cocos Islands as candidate sites.

***F. To continue effort for making Brazilian satellites data available via the new Argos data processing system Study (JTA-XXVIII action item n°8)***

Only one Brazilian satellite is still flying (SCD2). No policy agreement was obtained so far for the distribution of the (few) Argos data collected by this satellite to the community so the situation is still withheld.

***G. To install new antennas according to the following priority areas: the South Atlantic, the Indian Ocean and Southwest Pacific Ocean (JTA-XXVII action item)***

See Item B. above.

### **3.3. Argos-3 / PMT- Pilot projects**

*“To implement PMT pilot activity as soon as possible and to reactivate the offer concerning new generation PMTs” (4.3, 5.8).*

The purpose of the following paragraph is to give a global vision of the progress of the Argos-3 DBCP Pilot Project one year after its official kick-off.

#### **Context**

A DBCP Argos-3 evaluation project was established to evaluate the new system’s capabilities for the buoy community. Four drifter manufacturers have participated so far in the project: Clearwater, Marlin-Yug, Metocean, and Pacific Gyre. It was agreed that with the support from CLS,

manufacturers would develop an Argos-3 platform prototype, and then produce 10 drifters each for evaluation by the community. CLS offered to grant 50 SVP buoys to the DBCP (including 25 SVPB) that would be purchased from the five manufacturers. In return, participants' responsibilities would be to deploy the buoys, contribute to Argos service (Argos-2 current pricing) and evaluate the buoy performance.

### **Status of the DBCP Pilot project**

As of today, four manufacturers completed the implementation of the Argos-3 PMT into their drifters: Clearwater, Marlin-Yug, Metocean and Pacific Gyre. These drifting buoys use the interactive data collection mode with Argos-3 and the "pseudo-ack" mode with Argos-2 (message transmitted N times under one satellite pass) since the PMT modem calculates satellite pass predictions. Preliminary studies showed that these improvements permit to reduce message transmissions by 75% (thus increasing the buoys' life expectancy).

The first Argos-3 SVP and SVPB were made available by Clearwater and Pacific Gyre early in March 2009, while Metocean and Marlin-Yug were ready to deliver the units in summer 2009.

Luca Centurioni (SCRIPPS), the chairman of the Argos-3 steering team, coordinated ship opportunities for deployment of the Argos-3 drifters by interested users.

Twenty-seven SVP and SVPB drifters are scheduled for deployment between August and October 2009. Luca Centurioni and Shaun Dolk organized deployment opportunities of Pacific Gyre and Clearwater Argos-3 drifters. At the time of writing, ten SVP units from Pacific Gyre were planned to be deployed in the Central North Atlantic, five Clearwater drifters in the central tropical/equatorial Pacific and three other Clearwater units either in the Pacific Ocean or the Antarctic area.

The ten drifters manufactured by Metocean are scheduled to be deployed in September-October 2009 in the Southern Hemisphere by Julie Fletcher from NZ Weather Services (five SVP-B buoys), Graeme Ball from the Australian Bureau of Meteorology (three buoys) and Johan Stander from SAWS (two buoys).

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## ANNEX VI

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

#### *1. Report and recommendations from the Operations Committee*

##### **43<sup>rd</sup> Operations Committee (June 2009)**

##### G-1-1. Report on JTA Meeting

Yves Tréglos presented the report on JTA Meeting.

1. The 28<sup>th</sup> meeting on The Argos JTA was held in Cape Town, South Africa, from 17 to 18 October 2008, at the kind invitation of the South African Weather Service. Eleven ROCs/ROs were represented at the meeting, together with CLS/Service Argos. The meeting was served by the Joint Secretariat for JCOMM, made up of IOC and WMO Secretariats.

2. As agreed at the 27<sup>th</sup> meeting of the JTA (2007, Jeju, Republic of Korea), the length of the meeting was reduced from 3 to 1.5 days – 1 day for review/negotiation of the tariff and discussion on users' requirements, and half a day for wrap-up/conclusion and agreement on the work plan. This new organization was expected to ensure efficiency for future meetings, and reduce pressure on participants' time and budget.

3. Among the actions/decisions adopted by the meeting and of concern to Ops Com, it is worth noting that it was foreseen to send a Joint WMO-IOC letter to OPSCOM to address data delay issues, including NESDIS' efforts for blind orbit data being collected by the NPOES antenna in Svalbard. The letter was to be drafted by the joint Secretariat and reviewed by the chairs of the DBCP and of the Meeting on the JTA. (See attachment 1 for more details) At the time the present report is prepared, the chair JTA has no information about any follow up of the decision.

4. The Issue of unused ID's was raised again. In order to distinguish between silent but operational ID's and unused ID's, the meeting decided to introduce a new category, Silent service for which an administrative charge of EUR 3 per month per unit was to be applied beginning March 1, 2009. The 2009 Global Agreement was amended accordingly, as follows:

##### *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. This amount of unit charge will be implemented from 1 March 2009, and previous amount (3.62€ per month) will be applied until then. The purpose of this fee is to recover IDs no longer required.

##### *SILENT SERVICE*

From January 2009, a "Silent Service" with an administration of 3€ per month per unit will be applied to the IDs remaining silent but still being used.

5. Along with a well-established JTA practice, a new 5-year plan should be developed and adopted for the period 2010-2014. JTA-XXVIII decided on a procedure to prepare the plan (questionnaire to be developed by CLS and sent to the ROC; ROCs to answer the questionnaire; a preliminary version of the plan to be circulated well in advance of JTA-XXIX). CLS explained they had sent questionnaires to ROCs and were waiting for the answers. See section G-1-5 and Action 43-18.

6. It seems clearer and clearer that a significant number of ROCs have budget problems which prevent them to attend JTA meetings. In the same line, the joint Secretariat is also experiencing budget restrictions and needs some financial support, if they are to go on with their servicing the meetings. JTA-XXVIII decided that proposals for specific funding arrangements to address those difficulties should be worked out and submitted to JTA-XXIX. Discussions are (or will soon be) under way on this topic between CLS, the joint Secretariat and the ROCs.



### G-1-2. Status of U.S. Processing agreement

Eric Locklear began his presentation by thanking the OPSCOM for the opportunity to speak and represent the U.S. users. He started his report by recalling what the JTA is, and reviewing the relative distribution of each member country of their average active monthly PTTs and PTT consumption by country. He brought to the attention of OPSCOM that the bottom 6 countries total 90% of the average active PTTs and 88% of the PTT Annual consumption. Mr. Locklear went on to review last year's issues from OPSCOM 42, and what has happened since. He discussed his previous concern that there would be a move by the ARGO float community to move to Iridium, causing a significant loss in revenue. He discussed the results of a cost analysis that concluded that a move to Iridium would cost an estimated 4X the current ARGOS cost, and the benefits of such couldn't be justified at this time. While there is still an interest in using Iridium, there will not be any major shift. He went on to discuss the issue of the significant rise in operating cost due to the rise in gas and oil prices and conclude that rising operations costs is simply something that will be dealt with as a normal operating procedure. Mr. Locklear concluded his presentation by discussing the survey distributed to the users by the ROCs asking for input to help develop the next 5 year plan. This action came from the 28<sup>th</sup> JTA meeting. He stated that he has a concern of the low response rate, but he would personally survey the large users in the oceanographic community. Lastly, he also mentioned the issue of increased operating costs to support the JTA meetings and WMO/IOC Secretariats support of the JTA, but although this is a difficult issue, he felt a solution is workable.

### G-1-5. Financial Status of Agent

#### **Methodology to derive Argos costs to be attributed to the JTA:**

Christophe Vassal presented the meeting with the CLS methodology to derive the Argos basic costs to be attributed to the JTA.

It showed that the Argos basic costs have remained at approximately the same level from 12.25 M€ in 2007 to 12.38 M€ in 2008.

The Argos basic costs for science have remained stable whereas the Argos basic costs for fishing have increased, primarily to compensate a decrease in activity by enhancing the human effort to support and promote it. The Argos basic costs for sensitive use have slightly increased to reflect the small increase of the activity. In 2008, the costs to be attributed to the JTA are calculated at 6.50 M€ that represents a 1.06% increase compared to an increase of 13.4% in the average active PTTs processed and distributed (10498 in 2008 compared to 9528 in 2007). Also in 2008, platforms continued to benefit from the time slot calculations. This represented a few percent savings for every transmitter.

#### **At the 28<sup>th</sup> JTA meeting, the following was agreed:**

- Regarding the requirement for the application of time slot accounting to all programmes, that had been identified at the previous meeting (paragraph 6.12 of the Final Report for the JTA-27) and subsequently implemented by CLS, the meeting agreed that the scheme appeared to be working equitably and efficiently. It agreed to continue the current scheme without modification.
- Tariff issues concerning the unused IDs: At the request of the 27<sup>th</sup> Meeting in 2007, CLS presented a new scenario of the Tariff regarding the unused IDs. After extensive discussion on possible solutions to enhance ID return, the Meeting agreed on the following decisions:
  - ✓ To maintain the unused ID mechanism unchanged;

- ✓ To increase the unused ID fee from 3.62 to 5 Euros per month per unit, with the purpose of speeding-up the ID returns,
  - ✓ The new price to be implemented only from 1<sup>st</sup> March 09, in order to give the users the opportunity to give back their unused IDs before this is applied.
- Silent service: The issue of IDs in use and operational but silent was already discussed at JTA-27. In order to distinguish between silent but operational IDs and Unused IDs the meeting decided to introduce a new category, Silent service for which an administrative charge of EUR 3 per month per unit was to be applied beginning March 1, 2009. The above decisions are reflected in the 2009 Global Agreement.
- Future plans: five-year operating plan (FYP) 2010-2014
- ✓ In preparation for the Five Year Plan (FYP) for 2010-2014, the meeting agreed that the current JTA guidelines had been successfully applied during the past four years and that they should be retained as the basis of the next FYP. The meeting agreed on the following principles:
    - ✓ The benefits of JTA participation should be shared equally amongst all participants (Users);
    - ✓ The revenue collected from Users should meet the costs of providing the service;
    - ✓ Developments required by Users should be funded by Users;
    - ✓ Costs of developments not of benefit (or of marginal benefit) not driven by User Requirements should not fall on Users;
    - ✓ There should be a clear division between basic (funded) services and other (e.g. value added) services;
    - ✓ The tariff structure should be kept simple with as few service categories as possible.
    - ✓ The FYP will be proposed for adoption at the 29<sup>th</sup> meeting in 2009. In order to achieve a wide and timely participation of ROCs in the development of the FYP, the meeting agreed on the intercessional actions.

### **Financial Status of the agent:**

In 2008, CLS recorded revenues from JTA participating countries at a level of 7.08 M€. This was slightly different from the revenues expected from the JTA at 7.22 M€. This shortage in revenue is explained by remaining soft landing at a level of 0.14M€.

So in 2008, the JTA realized a small excess of 0.58 M€ which is going to add to the excess carried forward from the previous year of 0.33 M€ to bring the cumulative balance to 0.91 M€. The non JTA incomes decreased in 2008 from 6.79 M€ to 6.72M€, but the corresponding applications are still exceeding their portion of the costs. Consequently, the non JTA accumulated loss at the end of 2008 is calculated at 6.00M€.

At the date of the meeting, we believe the JTA in 2009 will likely be able to pay its portion of the cost.

The co-chair, Dave Benner thanked Christophe for his very clear and direct presentation of the comprehensive CLS financial information.

## 2. The 2005-2009 Year Operating Plan

The following 5 Year plan table updated with actual 2008 and projected 2009 numbers based on actual through May is provided here below. This table has been presented and discussed at the last OPCOM meeting, in June 2009.

In euro	2005 Actual	2006 Actual	2007 Actual	2008 Actual	2009 Projected
<b>JTA Costs (M€)</b>					
cost increase %	2.0%	2.0%	2.0%	2.0%	2.0%
Actual & Forecast	6.13	6.38	6.43	6.50	6.63
Agreed 5YP JTA Cost	6.00	6.40	6.40	6.40	6.40
<b>JTA Income</b>					
<b>Activity: Actual and Forecast</b>					
Growth Active PTTs (%)	21%	14%	6%	13%	2%
Growth PTT-yrs (%)	20%	10%	-7%	1%	2%
Active PTFs (Total)	7720	8768	9258	10498	10708
PTT-yrs (Total)	2852	3140	2934	2965	3024
Active PTTs (w/o large program)	5244	5910	6108	7208	7352
PTT-yrs (Buoys & Others)	682	663	584	560	572
PTT-yrs (floats w/o large pgm)	105	117	85	89	91
PTT-yrs (Animal)	580	630	664	719	733
PTT-yrs (Fixed stations)	156	149	135	145	148
Active PTTs (large pgm)	2476	2858	3150	3290	3356
PTT-yrs (large pgm) Buoys & Others	1258	1495	1353	1325	1352
PTT-yrs (large pgm) Floats	71	85	113	127	130
<b>Basic Service Income</b>					
Monthly fee (€)	15	15	15	15	15
Daily fee (€)	6.00	6.00	6.00	6.00	6.00
Month unit income (M€)	0.94	1.06	1.10	1.30	1.32
Day unit income (M€)	3.91	4.07	3.89	4.04	4.12
Large pgm Day Unit Income (M€)	1.94	1.70	1.68	1.70	1.73
<b>Total basic service expected (M€)</b>	<b>6.80</b>	<b>6.83</b>	<b>6.67</b>	<b>7.05</b>	<b>7.18</b>
<b>Additional revenue</b>	<b>0.14</b>	<b>0.14</b>	<b>0.14</b>	<b>0.17</b>	<b>0.15</b>
<b>Revenue shortage</b>					
Former JTA - CA, CN, UK	0.15	0	0		
Soft Landings	0.26	0.31	0.29	0.14	0.1
Revenue above Large Program Fixed price	0.59	0.35	0.00		
<b>Total Actual basic service (M€)</b>	<b>5.94</b>	<b>6.31</b>	<b>6.52</b>	<b>7.08</b>	<b>7.23</b>
<b>Year Balance</b>	-0.19	-0.07	0.09	0.58	0.60
<b>Carried forward from previous year</b>	0.50	0.31	0.24	0.33	0.91

Cumulated Balance	0.31	0.24	0.33	0.91	1.51
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### 3. Financial Statement

#### 3.1. Annual Expenses (in kEuros) for Year 2008

		Personnel	Costs	Amortization	Total
<b>Management</b>		<b>574</b>	<b>458</b>		<b>1,031</b>
<b>Operational costs</b>					
	Quality	80	45	0	124
	Studies & development	640	233	267	1,140
	Processing center	1,864	259	231	2,355
	Client support/customer service	1,002	318	0	1,320
<b>Sub-total Operational</b>		<b>3,586</b>	<b>854</b>	<b>498</b>	<b>4,939</b>
<b>Marketing costs</b>					
	Promotion Communication	1,265	817	4	2,087
	Travels, hosting	0	661	0	661
<b>Sub-Total Marketing</b>		<b>1,265</b>	<b>1,479</b>	<b>4</b>	<b>2,748</b>
<b>Administrative costs</b>					
	Administration, finance, audit	1,220	402	9	1,631
	Costs for presence	55	989	96	1,140
<b>Sub-Total Administrative</b>		<b>1,275</b>	<b>1,391</b>	<b>105</b>	<b>2,771</b>
<b>Taxes, bad debts provision &amp; financial costs</b>					
	Taxes	0	217	0	217
	Financial costs	0	339	0	339
	Provisions	0	335	0	335
<b>Sub-Total</b>		<b>0</b>	<b>892</b>	<b>0</b>	<b>892</b>
<b>Total</b>		<b>6,701</b>	<b>5,073</b>	<b>607</b>	<b>12,382</b>

Table 4.3.1: Detail on 2008 Expenses in k€

### 3.2. Details of Amortization Items

	Amortization	Description
<b>Operational costs</b>		
<u>Quality</u>	0	
<u>Studies &amp; development</u>	267	<i>GTS, SSA3, Argos 2001</i>
<u>Processing center</u>	231	<i>Maintenance processing center (hardware and software)</i>
<b>Sub-total</b>	<b>498</b>	
-		
<b>Marketing costs</b>		
<u>Promotion</u>	3	<i>Exhibit, International meetings, User Conference Costs</i>
<u>Communication</u>	1	<i>Exhibit, documentation Costs</i>
<b>Sub-total</b>	<b>4</b>	
-		
<b>Administrative costs</b>		
<u>Management control</u>	9	<i>Accounting system, Argos registred mark</i>
<u>Costs for presence</u>	96	<i>Office furniture, safety, general equipment</i>
<b>Sub-total</b>	<b>105</b>	
-		
-		
<b>Total</b>	<b>607</b>	

Table 4.3.2: Detail of Amortization Items in k€

### 3.3. Annual Incomes (in millions of Euros)

Incomes (M€)	2007	2008
JTA	6.52	7.08
Non JTA	6.79	6.72
<b>Total</b>	<b>13.31</b>	<b>13.80</b>

Table 4.3.3: JTA and non JTA 2007, 2008 Incomes

**3.4. Details of JTA and non JTA Incomes and Expenses (in million Euros)**

	2007	2008	
<b>Incomes</b>			
JTA CLS	2.60	3.01	
JTA SAI	3.92	4.07	
	<b>6.52</b>	<b>7.08</b>	<b>+8.55%</b>
Non JTA CLS	5.93	5.88	
Non JTA SAI	0.86	0.84	
	<b>6.79</b>	<b>6.72</b>	
<b>Total basic Argos incomes</b>	<b>13.31</b>	<b>13.80</b>	<b>3.69%</b>

<b>Total basic Argos expenses</b>	<b>12.25</b>	<b>12.38</b>	<b>+1.07%</b>
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Table 4.3.4: Detail of JTA and non JTA Incomes and Expenses

**3.5. JTA Annual Balance (in millions of Euros)**

	2007	2008
JTA Operating Costs*	6.43	6.50
JTA Income	6.52	7.06
Difference	0.09	0.56
Accumulated Difference	0.33	0.89

\* The remaining difference from 2006 was 0.24 M€.

Table 4. 3.5: Annual Balance

For year 2008, the costs to be attributed to the JTA, calculated using the methodology developed by CLS since 3 years now, is 6.50 M€.

## **4. Other Issues Relating to Argos Funding**

### **4.1. Management of ID numbers**

#### **➤ Unused ID Numbers**

JTA XXVIII Meeting (2008)

***“3.4.3 At the request of the 27<sup>th</sup> Meeting in 2007, the CLS presented a new scenario of the Tariff regarding the unused IDs (in Annex VI to this report). After extensive discussion on possible solution to enhance ID return, the Meeting agreed on the following decisions:***

- \ - to maintain the unused ID mechanism unchanged;***
- to increase the unused ID fee from 3.62 to 5 Euros per month per unit, with the purpose of speeding-up the ID returns;***
- the new price to be implemented only from 1<sup>st</sup> March 09, in order to give the users the opportunity to give back their unused IDs before this is applied”***

#### **➤ Silent Service**

***“3.4.4 The issue of ID’s in use and operational but silent was already discussed at JTA-27. In order to distinct between silent but operational IDs and Unused IDs, the meeting decided to introduce a new category, Silent service for which an administration charge of EUR 3 per month per unit was to be applied.”***

On March 1, 2009 CLS implemented as agreed, the higher unused ID fee of 5 Euros. However, CLS discovered that the mechanics of implementing the “Silent Service Fee” were more complex than initially believed. Consequently, CLS has deferred implementing the fee pending further review at the JTA 29 Meeting in Paris.

The complexity arises because CLS has no independent way to determine if an ID number is eligible for Silent Service. The requirement would be on the user to notify CLS if and when their ID was eligible as well as if and when the ID was no longer eligible. This places an impractical and undesirable administrative burden upon the user. Even today, it is common for most users to be unaware of even the quantity and status of ID numbers in their programs which is a primary contributing reason behind the very large difference (3 to 1) between the number of assigned ID’s and the number of active ID’s per month. It is, therefore, simply not reasonable nor practical to require or expect the users to implement the kind of real-time administrative ID bookkeeping needed to support a Silent Service fee process. Such a requirement would inevitably drive most users to decide to “simply wait” for two years until they are charged an unused ID fee for an ID that was actually in operation but silent, and then plead their case to CLS that the ID was really not unused but was actually in operation - but silent. But without that information being available to CLS the Silent Service Fee is useless.

CLS has therefore concluded that implementing a Silent Service Fee is impractical and is not in the best interest of the users, and herein proposes an alternate method to “incentivize” the recycling of Argos ID numbers.

### **Proposal to Replace Unused ID Fee and Silent Service Fee**

The management of ID numbers is an essential element of the Argos system. There are approximately 30,000+ ID numbers that are assigned to Argos programs. Only about one-third of these are active per month. Thus there are some 20,000 ID’s that could potentially be recycled and

re-used. Experience has shown, though, that recycling ID's by the users does require some type of incentive.

CLS proposes to eliminate the Unused ID fee and the Silent Service Fee and to apply a small monthly subscription fee to every ID that is assigned to a program. The subscription fee included in the new Five-Year Plan below is 0.5 Euros. By having to pay (even a small amount) for all IDs in their program the user is regularly made aware of the number of IDs assigned to them and is thus motivated to manage them efficiently during the lifetime of their program and hence minimize their Argos costs. For the owner of a stopped program the ID invoice acts as a swift reminder to the user to release the ID's.

#### **4.2. Argos-3 (Downlink messaging and high data rate channel) tariff**

It was decided at Opscom 42 (Germany) and again at Opscom 43 (U.S.) that the Argos-3 pricing should be defined after gaining experience on the actual usage during the DBCP Argos-3 pilot project.

### **5. New Five-Year Plan, 2010 - 2014<sup>2</sup>**

In October 1999 at the 19<sup>th</sup> JTA Meeting in Wellington, NZ, it was decided that a 5 year plan (YP) of projected Argos expenses and anticipated Argos consumption by the users would be a tool that would allow improved oversight and management of the Argos JTA cost recovery financial model. Annual review of the plan cooperatively with CLS would enable the JTA members to make sound choices regarding the Tariff levels for the near and longer term.

This year, 2009, marks the end of the second cycle of the JTA 5 year planning process. Thus, it is time to prepare the next 5 YP, for years 2010 – 2014. CLS prepared a proposed plan which has been reviewed and approved by the OPSCOM Co-chairs. A summary of the new plan is provided below and is followed by the plan in table form.

Analysis of each of the four JTA applications categories: i) Buoys and Others, ii) Floats, iii) Animals and, iv) Fixed Stations, as well as the "Large Program" category, indicates that Animal usage increases of 10% annually could be expected during the next five year period while Buoys and Others, and Fixed Stations will remain essentially stable at today's levels. The desired growth of Global Climate Observation Programs (e.g. Argo, Global Drifter Program, etc.) has the potential to create modest expansions in Floats( 2-3%) and "Large Programs" (3-5%) in the early years of this 5 YP.

The Argos JTA expenses will increase to about 5% during 2010 – 2012 as the operational deployment of Argos 3 is completed and the Argos 4 investment will ramp up, and our marketing efforts on wildlife and ocean-met applications are reinforced. They will then decrease to a minimum of 2% inflation increase for the last two years of the plan. Other expenses will remain essentially stable during this 5 YP.

Combining the projected expenses and usage (and hence revenue) in a single spreadsheet enables a thorough analysis of the impact of varying different elements of the JTA pricing structure. The result of the analysis performed by CLS is the proposed 5 YP at the end of this report. The proposed plan calls for an immediate (in year 2010) decrease in the daily rates for all applications categories and has a cumulated balance of 1.13M € at the end of year 2014.

#### **IMPORTANT NOTE:**

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<sup>2</sup> : This is the version was presented to JTA-29. However, the meeting adopted a slightly revised version which is detailed in Annex VII



The 5 YP below was submitted to and approved by the Argos Operations Committee (OPSCOM).

The Plan was based on some projected increases in large program usage beginning in 2010. It is likely that these increases will not materialize in the initial years of this Plan resulting in even greater annual deficits than illustrated below beginning with 2010. CLS believes that this would not be financially prudent and therefore requests the JTA to be willing to explore with CLS options for reducing or eliminating the negative annual revenues should the large program increases not begin in 2010.

In Euro	2010	2011	2012	2013	2014
<b>JTA Costs (M€)</b>					
cost increase %	5.0%	5.0%	4.4%	2.0%	2.0%
Actual & Forecast	7.10	7.48	7.81	7.98	8.15
<b>Agreed 5YP JTA Cost</b>					

<b>JTA Income</b>					
<b>Activity: Actual and Forecast</b>					
Growth Active PTTs (%)	7%	7%	7%	6%	6%
Growth PTT-yrs (%)	4%	4%	2%	2%	2%
Active Pttfs (Total)	12,070	12,908	13,781	14,619	15,493
PTT-yrs (Total)	3,046	3,168	3,225	3,276	3,326
Active PTTs (w/o large program)	8,600	9,267	9,995	10,793	11,667
PTT-yrs (Buoys & Others)	489	489	489	489	489
PTT-yrs (floats w/o large pgm)	90	93	96	99	101
PTT-yrs (Animal)	812	852	895	940	987
PTT-yrs (Fixed stations)	152	152	152	152	152
Active PTTs (large pgm)	3,470	3,641	3,786	3,826	3,826
PTT-yrs (large pgm) Buoys & Others	1,361	1,429	1,429	1,429	1,429
PTT-yrs (large pgm) Floats	142	153	164	167	167
<b>Basic Service Income</b>					
Monthly fee (€)	15.0	15.0	15.0	15.0	15.0
Daily fee (€) buoys and others	5.00	5.00	5.00	5.00	5.00
Daily fee (€) floats	7.50	7.50	7.50	7.50	7.50
Daily fee (€) animals	7.50	7.50	7.50	7.50	7.50
Daily fee (€) fixed stations	2.50	2.50	2.50	2.50	2.50
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€)	1.55	1.67	1.80	1.94	2.10
Day unit income (M€)	3.50	3.62	3.74	3.87	4.01
Large pgm Day Unit Income (M€)	1.77	1.87	1.90	1.92	1.92
<b>Total basic service expected (M€)</b>	<b>6.82</b>	<b>7.15</b>	<b>7.45</b>	<b>7.73</b>	<b>8.02</b>

<b>Additional revenue</b>	<b>0.194</b>	<b>0.194</b>	<b>0.194</b>	<b>0.194</b>	<b>0.194</b>
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<b>Total Actual basic service (M€)</b>	<b>7.01</b>	<b>7.35</b>	<b>7.64</b>	<b>7.92</b>	<b>8.22</b>
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<b>Year Balance</b>	<b>-0.09</b>	<b>-0.13</b>	<b>-0.17</b>	<b>-0.06</b>	<b>0.07</b>
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Carried forward from previous year	1.50	1.42	1.28	1.11	1.06
Cumulated Balance	1.42	1.28	1.11	1.06	1.13

## 6. Development Projects of the Argos System

These projects are presented in three categories:

### 6.1. Latest Projects Completed (2008):

- ArgosWeb evolutions: ongoing enhancement. Implementation of program activity and Unused ID reports for users and ROCs.
- Implementation of observation processing (delivery of physical values)
- Implementation of GDOP in Argos Location calculation for better estimation of location accuracy
- Improved delivery times (open action item)
- Implementation of METOP compatible network of LUT antennas (ongoing)
- Downlink Messaging Monitoring Center upgrade and related web interface
- METOP HRPT ON since September 29th, 2008 on limited geographical area (North Atlantic ocean, Indian ocean)
- Argos GTS processing system in operation since May 20th, 2008
- GTS Subsystem adjustments and developments (open action item)

### 6.2. Projects Being Developed (2009)

- Successful launch of NOAA N Prime (February 2009) with an Argos-3 instrument
- NOAA N Prime delivered to all ARGOS users on August 3rd, 2009
- ARGOS3 (Downlink) into operation
- Argos-3 implementation plan
- 3 New antennas with EARS network
- Argos system monitoring : implementation of a reference platforms network
- Disaster Recovery implementation
- Monthly Argos operation and GTS monitoring reports available Processing Iridium data (implementation and ongoing enhancements)

### 6.3. Projects under study

- Argos 4 instrument.
  - Web services and new distribution formats
  - Implementation of 6 digits ID numbers
  - New Argos location algorithm for applications running under harsh conditions (animal tracking for instance)
-

**ANNEX VII**

**FIVE-YEAR PLAN FOR 2010 TO 2014**

*(Version approved by JTA-XXIX)*



# JTA 5 year Plan 2010-2014

## SUMMARY DOCUMENT

CLS

Date: 2 October 2009

## I. INTRODUCTION

In October 1999 at the 19<sup>th</sup> JTA Meeting in Wellington, NZ, it was decided that a 5 year plan (YP) of projected Argos expenses and anticipated Argos consumption by the users would be a tool that would allow improved oversight and management of the Argos JTA cost recovery financial model. Annual review of the plan cooperatively with CLS would enable the JTA members to make sound choices regarding the Tariff levels for the near and longer term.

This year, 2009, marks the end of the second cycle of the JTA 5 year planning process. Thus, it is time to prepare the next 5 YP, for years 2010 – 2014. CLS has prepared a proposed plan and this document presents that plan and summarizes the steps taken and the information gathered to develop it.

## II. SUMMARY

Analysis of each of the four JTA applications categories: i) Buoys and Others, ii) Floats, iii) Animals and, iv) Fixed Stations, as well as the “Large Program” category, indicates that Animal usage increases of 10% annually could be expected during the next five year period while Buoys and Others, and Fixed Stations will remain essentially stable at today’s levels. The desired growth of Global Climate Observation Programs (e.g. Argo, Global Drifter Program, etc.) has the potential to create modest expansions in Floats (2-3%) and “Large Programs” (3-5%) in the early years of this 5 YP.

The Argos JTA expenses will increase to about 5% during 2010 – 2012 as the operational deployment of Argos 3 is completed and the Argos 4 investment will ramp up, and our marketing efforts on wildlife and ocean-met applications are reinforced. They will then decrease to a minimum of 2% inflation increase for the last two years of the plan. Other expenses will remain essentially stable during this 5 YP.

Combining the projected expenses and usage (and hence revenue) in a single spreadsheet enables a thorough analysis of the impact of varying different elements of the JTA pricing structure. The result of the analysis performed by CLS is the proposed 5 YP at the end of this report. The proposed plan calls for an immediate (in year 2010) **decrease in the daily rates for all applications categories** and has a cumulated balance of 1.13M € at the end of year 2014.

## III. JTA USAGE/REVENUE PROJECTIONS

The revenue projections incorporated into this plan are derived from four primary actions:

- Analysis of actual Argos usage trends during the past 5 years
- Analysis of the results of a questionnaire sent to all JTA users
- Compilation of information gathered from direct contacts (visits, phone calls, etc.) with users, manufacturers, integrators and program managers using Argos
- Participation in international programmes and conferences with analysis of their plans

## **Past Trends**

In general, since 2005, there has been a relatively steady increase on average in the number of active PTTs and PTT-Year consumption for all JTA categories except for *Buoys and Others*. The decreases in the *Buoys and Others* category are attributed primarily to the application of time-slots as well as the migration of users to Iridium.

## **Questionnaires**

Wishing to maximize the amount of factual information behind the 5 YP projections, the Capetown JTA meeting decided on an intersessional action for CLS “To issue a questionnaire to their users to collect information on future usage of the Argos system...” The questionnaire was sent to all ROCS (Representatives of Country) in April 2009 for distribution to their users. Additional subsequent direct contacts with some users also took place.

Questionnaire responses (101) were received from 19 different countries. The programs reflected in these responses represent 54% (6337) of the current 2009 Active Platforms, and 68% (2,036) of the total 2009 PTT-years. The distribution of the responses by application is given in the table below.

Theme	# Answers	Active PTTs 09	PTT-yrs 09
Met-Ocean	57	84%	85%
Wildlife	44	23%	21%
Total	101	6337	2036

In short, the questionnaire responses project stability or a slight decrease in Buoys and Others, a healthy and steady increase in Animals, and stability or slight increases in both Floats and Fixed Stations. Feedback from the “Large Program”, the NOAA/Office of Climate Observation, appears to have the greatest positive impact on the 5 YP projections with anticipated growths of 300 profiling floats and 200 drifters during the course of this Plan. Anticipated new Argos activities in Russia and China and possibly India offer some promise to help offset/stabilize the decreases mentioned above.

## **Direct Contacts**

Because the manufacturers represent an essential component of the Argos system, many of them were contacted directly and asked about their perspectives on the evolution of their Argos business over the next 3 – 5 years. Approximately 10 manufacturers/integrators were contacted and their feedback, which was quite consistent with projections from the other sources, is reflected in the 5 YP included herein. A common theme among the manufacturers was that although they were all somewhat optimistic about their Argos business for the next several years, they also felt strongly that the global economic situation is a “wild card” and adds significant uncertainty to their business projections.

**Combined Usage Projections from All Sources**

The table below illustrates the Argos usage projections developed from the three information sources above.

Progress (%)	Proj.2009	2010	2011	2012	2013	2014
<b>Buoys &amp; Others</b>						
Active PTTs	903	0%	0%	0%	0%	0%
PTT-years	489	0%	0%	0%	0%	0%
<b>Floats</b>						
Active PTTs	1206	3%	3%	3%	3%	3%
PTT-years	87	3%	3%	3%	3%	3%
<b>Animals</b>						
Active PTTs	5,693	10%	10%	10%	10%	10%
PTT-years	773	5%	5%	5%	5%	5%
<b>Fixed Stations</b>						
Active PTTs	186	0%	0%	0%	0%	0%
PTT-years	152	0%	0%	0%	0%	0%
<b>Large Pgm</b>						
Active PTTs	3340	4%	5%	4%	1%	0%
Active Buoys & Others	1577	4%	4%	2%	0%	0%
PTT-years Buoys & Others	1,296	5%	5%	0%	0%	0%
Active Floats	1,763	4%	6%	6%	2%	0%
PTT-years Floats	136	5%	7%	7%	2%	0%
<b>Total Active non Large Pgm</b>	<b>7,988</b>	<b>7.7%</b>	<b>7.7%</b>	<b>7.9%</b>	<b>8.0%</b>	<b>8.1%</b>

**IV. EXPENSE PROJECTIONS**

The primary Argos objectives for the years 2010 – 2014 are to complete the technical development and the promotion/deployment of the new Argos generations including especially the two-way capability, the high data rate functions and the technical evolution of the Argos-3 and Argos-4 transceivers.

**Argos-3**

Argos-3 remains to be fully implemented by manufacturers now that the space system and processing centre are operational and are beginning to be used by the community. Three actions are required:

- Complete integration with ALL manufacturers and progressively replace PTTs with PMTs
- Develop and promote an Argos mission planning tool to help manufacturers when configuring their equipment, or users, to simulate and become familiar with Argos-3 functionalities
- Promote Argos-3 to existing and emerging communities requiring high data rate, and bi-directionality: e.g. marine biology, sea ice and climate, coastal oceanography, wildlife.

#### **Argos-4**

The Argos-4 development must be implemented to enable continuous improvement of the Argos capabilities within all communities addressed by Argos-3. Consequently, priorities for 2010-2014 will be:

- Support the space design and perform the ground segment design, development up to launch and commissioning of the first Argos-4 satellite
- Design and prototype the Argos-4 operating principles with manufacturers in parallel with the space segment design (must be done well in advance to allow an operational use of Argos-4 transceivers as soon as the first satellite is commissioned)
- Prototype Argos-4 small (even micro) transmitters/transceivers for the land wildlife community and make them able to be integrated at the manufacturer's level
- Implement strong Argos-4 marketing and promotion campaigns during the second half of the period to be ready for launch.

#### **Expense Assumptions**

The overall JTA manpower is expected to remain stable over the next five years. Specifically, the operations manpower will benefit from synergies associated with monitoring the operations of other systems, while a significant effort will be undertaken to promote Argos broadly in the science community, particularly in the U.S. The user services efforts must be reinforced to support the requests and declaration activities from new programs particularly in the wildlife community which is much less structured and supported through international programs and networking than the oceanography community.

In short, the total JTA cost is expected to increase by less than 20% over the five-year period and the volume of active PTTs is expected to grow by 34%. This positive situation has the potential to allow for JTA tariff reductions based on careful annual review and assessment during this next 5 YP.

## V. THE APPROVED 5 YP FOR 2010 - 2014

Below is the 5 YP proposed at the Paris meeting by CLS and approved by the JTA chairman for the period 2010 – 2014. Based on the expense and usage projections outlined above, this Plan proposes reductions in the JTA Daily tariff Rate from the 2009 values for some applications categories. The important features of the plan to note are:

- The JTA % Cost increases and the associated amounts in M€
- Reduction in daily fee, Buoys and Others from **6 € to 5.5 €**
- Reduction in daily fee, Floats, from **9 € to 8.25 €**
- Reduction in daily fee, Animals, from **9 € to 8.25 €**
- Maintain 12-day capping for Animals
- Reduction in daily fee, Fixed Stations, from **3 € to 2.5 € remains at 3 €**
- Slight increase in “Additional Revenue” line (unused ID fees)
- Elimination of all “Revenue Shortages” from previous plans
- Total cumulated balance in year 2014 of **1.17M €**

The Plan will be reviewed annually as is customary with any adjustments as required

### Issues Not Addressed in this Plan

There are three important JTA issues that are not yet able to be addressed in this plan;

1. The impact of Argos-3 pricing. An Argos-3 pricing structure has not yet been established and must wait until there has been an adequate amount of Argos-3 usage for a basis to exist for defining the pricing. A pricing structure will likely not be determined until at least mid 2010.
2. Unused ID fee (the “Additional Revenue” line). The unused ID fee was reviewed again at the meeting in Paris in October, 2009. Because no change will be implemented in 2010 the projected amount of revenue is based on the current unused ID fee.
3. Penetration by Iridium services in the buoy and float community may lower estimates of revenues. The 5 year plan assumes flat growth thus any decrease in buoy/drifter PTT/years may be offset by growth in other sectors.

### THE PLAN:

The 5 YP was submitted to and approved by the Argos Operations Committee (OPSCOM) in June 2009. The Plan was based on some projected increases in large program usage beginning in 2010. It is likely that these increases will not materialize in the initial years of that plan. Consequently an alternate plan was presented to and approved by the JTA at the Paris meeting. That approved plan is included below.



In euro	2009 Projected	2010	2011	2012	2013	2014
<b>JTA Costs (M€)</b>						
cost increase %	2.0%	5.0%	5.0%	4.4%	2.0%	2.0%
Actual & Forecast	6.76	7.10	7.48	7.81	7.98	8.15
Agreed 5YP JTA Cost	<b>6.40</b>					

<b>JTA Income</b>						
<b>Activity: Actual and Forecast</b>						
Growth Active PTTs (%)	8%	5%	6%	7%	7%	7%
Growth PTT-yrs (%)	-1%	1%	1%	4%	4%	2%
Active PTFs (Total)	11,329	11,940	12,607	13,465	14,435	15,494
PTT-yrs (Total)	2,933	2,975	3,018	3,135	3,261	3,322
Active PTTs (w/o large program)	7,989	8,600	9,267	9,995	10,793	11,667
PTT-yrs (Buoys & Others)	489	489	489	489	489	489
PTT-yrs (floats w/o large pgm)	87	90	93	96	99	101
PTT-yrs (Animal)	773	812	852	895	940	987
PTT-yrs (Fixed stations)	152	152	152	152	152	152
Active PTTs (large pgm)	3,340	3,340	3,340	3,470	3,641	3,827
PTT-yrs (large pgm) Buoys & Others	1,296	1,296	1,296	1,361	1,429	1,429
PTT-yrs (large pgm) Floats	136	136	136	142	153	164
<b>Basic Service Income</b>						
Monthly fee (€)	15	15.0	15.0	15.0	15.0	15.0
Daily fee (€) buoys and others	6.00	5.50	5.00	5.00	5.00	5.00
Daily fee (€) floats	9.00	8.25	7.50	7.50	7.50	7.50
Daily fee (€) animals	9.00	8.25	7.50	7.50	7.50	7.50
Daily fee (€) fixed stations	3.00	3.00	3.00	3.00	3.00	3.00
Monthly fee (€) OCO	15	15	15	15	15	15
Daily fee (€) OCO buoys	2.00	2.00	2.00	2.00	2.00	2.00
Daily fee (€) OCO floats	3.00	3.00	3.00	3.00	3.00	3.00
Month unit income (M€)	1.44	1.55	1.67	1.80	1.94	2.10
Day unit income (M€)	4.06	3.86	3.65	3.77	3.90	4.04
Large pgm Day Unit Income (M€)	1.70	1.70	1.70	1.77	1.87	1.91
<b>Total basic service expected (M€)</b>	<b>7.20</b>	<b>7.11</b>	<b>7.01</b>	<b>7.34</b>	<b>7.72</b>	<b>8.05</b>

<b>Additional revenue</b>	<b>0.17</b>	<b>0.194</b>	<b>0.194</b>	<b>0.194</b>	<b>0.194</b>	<b>0.194</b>
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<b>Year Balance</b>	<b>0.61</b>	<b>0.20</b>	<b>-0.28</b>	<b>-0.27</b>	<b>-0.07</b>	<b>0.09</b>
<b>Carried forward from previous year</b>	<b>0.89</b>	<b>1.50</b>	<b>1.70</b>	<b>1.42</b>	<b>1.15</b>	<b>1.08</b>
<b>Cumulated Balance</b>	<b>1.50</b>	<b>1.70</b>	<b>1.42</b>	<b>1.15</b>	<b>1.08</b>	<b>1.17</b>

## **ANNEX VIII**

### **TERMS AND CONDITIONS OF THE GLOBAL AGREEMENT FOR 2010**

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

#### **TIME PERIOD OF COVERAGE:**

These Terms and Conditions are valid for the time beginning on **January 1 and ending on December 31, 2010.**

#### **DEFINITIONS**

"Platform-year" is defined as 365 days of operation of an acceptable Platform Transmitter Terminal (PTT).

"ROC" is the Representative of Country 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 herein 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 PTTs of the authorized users:

- (1) Location determination or both location determination and data collection for PTTs 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) PTTs 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
- (5) 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 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	5.5
<b>Fixed Stations</b>	15	3
<b>Animals*</b>	15	8.25
<b>Subsurface Floats</b>	15	8.25

**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
300	5	7.5
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. 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;
- (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.

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

Additional 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

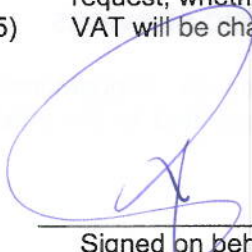
- (1) These Terms and Conditions do not cover the costs of special additional services made to provide the processed data back to the users. These must be made by the user directly with CLS;
- (2) However, it is understood that CLS will continue to provide data from PTTs via the World Weather Watch Global 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 PTTs which are government funded. However, other users of agencies or organizations which are considered "non-profit" may be authorized. PTTs 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 PTTs 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

29/10/09  
\_\_\_\_\_  
/ /

  
\_\_\_\_\_  
Signed by CLS  
Chief Executive Officer  
Christophe VASSAL

29/10/2009  
\_\_\_\_\_  
/ /

\_\_\_\_\_

## ANNEX IX

### JTA OPERATING PRINCIPLES

*(as agreed at the JTA-29 Meeting)*

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

- 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 Users Groups (RUGs);
- Representatives of the Argos satellite system operator and service provider;
- Representatives of the Argos Operations Committee (OPSCOM);
- 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 for the JTA were drafted at the JTA-XXIII (Angra dos Reis, 2003), 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 sponsored and those affecting Users agreed in advance.

2.2 The Terms of Reference of the Argos Joint Tariff Agreement (JTA) are provided in Annex 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 A. The Terms of Reference of the ROCs, including mechanism for their nomination are provided in Annex C.

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

3.2.1 An RO is the Responsible Organization representing an agreed set of Argos User programs 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-XXIV, 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 programs 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 programs for which the RO is responsible, including

- (i) responsibility for organizing the payment of CLS Argos invoices for its Users
- (ii) providing support to members of the RO's User group

3.2.4 The Terms of Reference of the ROs are provided in Annex 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 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).

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

- to report to the JTA on developments and operations, on the use and performances of the system;
- to report to JTA of 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);
- to collect requirements from the user community and implement required solutions when possible;
- to interface with the participating space agencies to assist in providing system upgrades if requested;
- 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;



- to develop and maintain the ground system and the Global data processing centres;
  - to operate the ARGOS ground segment;
  - to operate the Global processing centres under quality of service constraints and deliver data collected to the user community according to international standard data exchange requirements and protocols;
  - to perform multi-levels of quality of control on the data;
  - to store all data processed for a duration of xx months and to make it easily extractable in response to user requests;
  - to monitor and control the overall performances of the systems so as to guarantee the level of quality and continuity of service;
- 
- to promote the use of the ARGOS system and market new user communities, with the goal of minimizing the cost of using Argos;
  - to support users through responsive customer service for any request, claim or declaration of equipment;
  - to support the JTA Executive Committee in JTA management and operations;
  - to support ROCs and ROs as needed especially by facilitating access to and interaction between them and the user communities.

### 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 connection, 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 formulate 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.

3.4.5 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 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 for the preparation of the JTA meeting, including; 1) circulation of invitation letters, 2) coordination for the collection, and electronic publication of the preparatory documentations, and 3) electronic publication of the final reports.
- Upon request by JTA Chairperson, and as appropriate, issue the general communication with JTA stakeholders as appropriate (e.g. for the nomination of Representatives), and the publication of documents.
- Serve as members of the JTA Executive Committee.

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 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 of the JTA Chairperson, and the JTA vice-Chairperson, details about their election and terms are provided in Annexes F and 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 H.

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

6.1 Structure

The structure of the meeting consists of deliberative sessions over 2 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)

#### 6.4 Secretariat

Secretariat for the running of the Session, and writing of the final report is the responsibility of the JTA Chairperson with support from Session participants as necessary.

#### 6.5 Typical agenda for JTA meetings is provided in Annex 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. Typical intersessional workplan, and reporting process is provided in Annex J.

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## ANNEX 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 programs 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 unique Responsible Organization representing a country or a group of countries.»*

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-XXVII 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 programs 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 Programs for the purposes of their collective participation in the JTA.

The tariff structure, price-setting arrangements and relationships between CLS / Argos, User Programs 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 programs, 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 programs 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 programs and user service classes. Provide high level collective advocacy of all user programs 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 programs, 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 program eligibility. On referral from CLS / Argos, adjudicate the eligibility of new user programs 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 programs they represent are adequately conveyed through a ROC who will be attending the meeting, or else through their National Report.

#### 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 programs 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
- CLS / Argos is to provide the ROCs on a quarterly basis with the list of unused IDs (and the date of the last transmission) for each programme.
- 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.

### **ROC ROLES - INTERFACE WITH END USER PROGRAMS**

ROC's 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 programs;
- Assurance of global tariff consistency, stability and predictability;
- Opportunities for cross - fertilization. Provide a point of reference to other (like or complementary) programs, 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 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:

- 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 Users Groups (RUGs);
- Representatives of the Argos satellite system operator and service provider;
- Representatives of the Argos Operations Committee (OPSCOM);
- 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.

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## **ANNEX 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 official representative of a Member (State) of WMO or IOC;

ROCs are designated through either of the following mechanisms:

- 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;
- The agency or consortium consults with other Argos users in the country;
- The agency or consortium writes to the JTA Chairperson asking to be added in the list of ROCs;
- 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 mean of either:
  - A letter issued by the Permanent Representatives of a country with WMO to the Secretary General of WMO;
  - A letter issued by the IOC Action Addressee of a country to the Executive Secretary, IOC;
- The ROCs are formally endorsed at annual JTA session.

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 mean 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 on a quarterly basis by CLS;

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;
  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 ROCs.
-

## **ANNEX 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:

- 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);
  - The agency or consortium consults with other Argos users and ROCs in the corresponding country(ies);
  - The agency or consortium writes to the JTA Chairperson asking to be added in the list of ROs;
  - The ROs are formally endorsed at 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 mean 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 on a quarterly basis by CLS;
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;
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.

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## **ANNEX 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.

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

- 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).
  - In order to participate in the substantive negotiation process, the prospective RUG must satisfy the JTA Executive Committee (JTA-EC) that he/she has the necessary credentials to fairly represent the relevant user group.
  - 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.
  - Notwithstanding the above, the JTA sessions are open with observer status to any interested person (see JTA TORs).
  - 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.
  - 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.
  - 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.
  - 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.
-

## **ANNEX 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 and vice-Chairperson 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 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 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;
  6. The Chairperson shall routinely circulate information to the JTA participants during the intersessional period as appropriate;
  7. The Chairperson shall deputise 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 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.
-

## **ANNEX 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 Chairperson and vice-Chairperson 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 only for one subsequent term.

Terms of Reference for the JTA vice-Chairperson:

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

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## **ANNEX 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:

1. Assist the chairperson in the preparation of reports, and their submission, if needed, to the IOC and WMO Secretariats for distribution.
2. To annually review the functions and duties of the JTA and recommend any changes to the Chairperson for discussion and approval at the JTA Session.
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:
  - Chairperson
  - Vice-Chairperson
  - IOC Secretariat
  - WMO Secretariat
  - Three additional members proposed by the Chairperson and elected by the JTA. These members will serve a term of 2 years with an optional 2-year appointment.
2. Careful consideration should be made to ensure a proper mix that represents nations, user groups, and subject matter experts.

#### 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 I**

### **TYPICAL AGENDA FOR JTA SESSIONS**

*(here in case the session is held 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>3</sup>
  2. REPORT OF THE CHAIRPERSON OF THE JTA
  3. REPORT ON THE YYYY GLOBAL AGREEMENT
  4. REPORT ON THE DEVELOPMENT OF CLS
  5. REVIEW OF USER'S REQUIREMENTS
  6. REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS
  7. TERMS AND CONDITIONS OF THE YYYY+1 GLOBAL AGREEMENT
  8. THE FUTURE OF THE JOINT TARIFF AGREEMENT, INCLUDING REVIEW OF THE OPERATING PRINCIPLES
  9. FUTURE PLANS AND PROGRAMMES
  10. ELECTION OF THE CHAIRPERSON AND VICE-CHAIRPERSON
  11. DATE AND PLACE OF THE NEXT MEETING
  12. CLOSURE OF THE MEETING
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<sup>3</sup> : The purpose of the WG is to take the minutes, compile a draft report of the proceedings for approval of the JTA and submission to the Secretariats.

## **ANNEX 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 Month        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 Month         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 JTS Session made available to all participants
  - JTA Session:                   12 Months        October
-

**ANNEX K**

**FORMAT FOR THE NATIONAL REPORTS TO THE JTA**

**JTA National Report**

**Year: 2009**

**Country:**

*(please delete text in italic and replace with actual information)*

**Section 1. Overall Summary**

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

**Section 2. User Types by family (Table of PTT use by the country)**

*(please complete the table below based on actual and estimated use for the current year)*

	<b>Average active PTTs per month</b>	<b>Total PTT.Years</b>
<b>Buoys and others</b>		
<b>Profiling floats</b>		
<b>Animals</b>		
<b>Fixed stations</b>		
<b>TOTAL</b>		

*The objective of this section is to provide some data on platform distribution and use. Historical graphs and charts depicting the country's program is encouraged.*

**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 program 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.*

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## ANNEX X

### NATIONAL REPORTS ON CURRENT AND PLANNED PROGRAMMES

**Year:** 2009  
**Country:** Germany

#### **Section 1. Overall Summary**

##### **1. Water masses in the Nordic Seas**

Detlef Quadfasel, [DETLEF.QUADFASEL@ZMAW.DE](mailto:DETLEF.QUADFASEL@ZMAW.DE)  
Hamburg University, Zentrum für Meeres- und Klimaforschung, Institut für Meereskunde,  
Bundesstr. 53, 20146 Hamburg, Germany

##### **ARGOS Programme Number 592**

*The aim of the program is to monitor the water masses in the different basins of the Nordic Seas with the data from profiling floats (Greenland Sea , Norwegian Sea, Iceland Sea, Lofoten Basin). Since 2001 floats were deployed in the Greenland Sea, since 2004 also in the Norwegian Sea and Lofoten Basin and since 2005 in the Iceland Sea. Changes in the water mass transformation processes and therefore also in the water mass characteristics in the context of climate change are examined. The floats are part of the international ARGOS programme. More information is available at*

*<http://www.ifm.zmaw.de/forschung/regionale/projekte/mersea/>*

##### **2. Hamburg Ice Buoy Programme**

Burkhard Bruemmer, [BURGHARD.BRUEMMER@ZMAW.DE](mailto:BURGHARD.BRUEMMER@ZMAW.DE)  
Meteorological Institute, ZMAW, University of Hamburg, Bundesstr. 55, 20146 Hamburg, Germany

##### **ARGOS Programme Number 636**

*The project studies processes in key regions of the climate system using air crafts and data buoys. Examples are atmospheric cold air outbreaks and their influence on deep water production in the North Atlantic and the influence of cyclones on the advection of Atlantic waters into the Arctic. More information is available at <http://www.mi.uni-hamburg.de/8.0.html>*

##### **3. IfM-Geomar: Mooring watch dogs**

Jürgen Fischer, [JFISCHER@IFM-GEOMAR.DE](mailto:JFISCHER@IFM-GEOMAR.DE)  
Leibniz-Institut für Meereswissenschaften, IFM-GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany

##### **ARGOS Programme Number 783**

*The aim of the project is to monitor moorings with Argos watchdogs. More information is available at [http://www.ifm-geomar.de/index.php?id=physoz&no\\_cache=1](http://www.ifm-geomar.de/index.php?id=physoz&no_cache=1)*

##### **4. Sea ice processes in polar regions**

Gerd Rohardt, [Gerd.Rohardt@awi.de](mailto:Gerd.Rohardt@awi.de)  
Alfred Wegener Institute, P.O. Box 120161, 27515 Bremerhaven, Germany

##### **ARGOS Programme Number 919**

*The aim of the project is to monitor moorings with Argos watchdogs. More information is available at [http://www.awi.de/de/forschung/fachbereiche/klimawissenschaften/messende\\_ozeanographie/instrumente/verankerungen/](http://www.awi.de/de/forschung/fachbereiche/klimawissenschaften/messende_ozeanographie/instrumente/verankerungen/)*

## **5. Norway**

Dieter Schrader, [Dieter.Schrader@BSH.DE](mailto:Dieter.Schrader@BSH.DE)  
Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

### **ARGOS Programme Number 948**

*The Norway measurements take place at fixed monitoring stations in the North Sea and Baltic Sea (see Marnet programme). Waverider buoys are measuring sea state conditions, one of these is transmitting data through the ARGOS satellite system. Watchdog services are used for the other buoys. More information is available at <http://www.bsh.de/de/Meeresdaten/Beobachtungen/Seegang/index.jsp>*

## **6. Bird migration in Africa and Eurasia - a pilot study**

Max Planck Research Centre for ornithology, Migration and Immuno-ecology (Vogelwarte Radolfzell), Schloß Möggingen, Schloßallee 2, 78315 Radolfzell, Germany  
Martin Wikelski, [martin@ORN.MPG.DE](mailto:martin@ORN.MPG.DE)

### **ARGOS Programme Number 983**

*The International Cooperation for Animal Research Using Space (ICARUS) mission is working towards establishing a remote sensing platform for scientists world-wide that can track small organisms globally, enabling observations and experiments over large spatial scales. A white paper is available at <http://www.icarusinitiative.org>*

## **7. Migration of raptors**

Bernd Meyburg, [BUMeyburg@aol.com](mailto:BUMeyburg@aol.com)  
World working group on birds of prey and owls (Berlin), Wangenheimstr. 32, D-14193 BERLIN, Germany.

### **ARGOS Programme Number 1126**

*The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. More information is available at <http://www.raptors-international.de/index.htm>*

## **8. Migrating behaviour of antarctic seals**

Joachim Plötz, [JPLOETZ@AWI-BREMERHAVEN.DE](mailto:JPLOETZ@AWI-BREMERHAVEN.DE)  
Alfred Wegener Institute, P.O. Box 120161, 27515 Bremerhaven, Germany

### **ARGOS Programme Number 1535**

*The Marine Mammal Tracking (MMT) project of AWI and its Partner Institutions concentrates on the Southern Ocean. Variations in the foraging ranges and movements of marine mammals are an important source of information about environmental variability integrated over a wide range of*

*spatial and temporal scales. The complex synthesis of data on marine mammal positioning and feeding locations with oceanography and bathymetry aims to identify those parameters which are characteristic for feeding areas of top predators in the respective regions, and will provide clues as to why some areas of the Antarctic Ocean are important to these animals while others are not. This will further our understanding of the distribution patterns of marine mammals in Antarctic and Subantarctic marine ecosystems of the Southern Ocean. More information is available at [http://www.awi.de/en/research/research\\_divisions/biosciences/marine\\_animal\\_ecology/research\\_themes/marine\\_endotherm\\_ecology/](http://www.awi.de/en/research/research_divisions/biosciences/marine_animal_ecology/research_themes/marine_endotherm_ecology/)*

## **9. IfM-Geomar: gliders**

Jürgen Fischer, [JFISCHER@IFM-GEOMAR.DE](mailto:JFISCHER@IFM-GEOMAR.DE)

Leibniz-Institut für Meereswissenschaften, IFM-GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany

### **ARGOS Programme Number 1783**

*The gliders are equipped with Argos beacons to transmit data in emergency cases. More information is available at <http://www.ifm-geomar.de/index.php?id=glider>*

## **10. Bigset**

Olaf Pfannkuche, [OPFANNKUCHE@IFM-GEOMAR.DE](mailto:OPFANNKUCHE@IFM-GEOMAR.DE)

Leibniz-Institut für Meereswissenschaften, IFM-GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany

### **ARGOS Programme Number 1806**

*The project BIGSET (in situ experiments using benthic chamber landers ) studies processes at the benthic boundary layer. The autonomous instrument carrier systems are equipped with ARGOS beacons for retrieval. The landers are usually deployed on the seafloor at depths of several hundred to 6,000 metres beyond the reach of remote sensing and conventional systems. More information is available at [http://www.ifm-geomar.de/index.php?id=mg\\_observatorien](http://www.ifm-geomar.de/index.php?id=mg_observatorien)*

## **11. Tracking of penguins at sea**

Klemens Pütz, [KLEMENS.PUETZ@EWETEL.NET](mailto:KLEMENS.PUETZ@EWETEL.NET)

Antarctic Research Trust, Am Oste-Hamme-Kanal 10, 27432 Bremervörde, Germany

### **ARGOS Programme Number 1857**

*The project studies the ecological feeding behaviour of penguins and their favoured foraging grounds. More information is available at <http://www.antarctic-research.de/>*

## **12. German-Argo/BSH**

Birgit Klein, [BIRGIT.KLEIN@BSH.DE](mailto:BIRGIT.KLEIN@BSH.DE)

Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

### **ARGOS Programme Number 1895**

*The aim of the program is to contribute to the international Argo programme with about 50 floats per year. All BSH floats are transmitting their data through the ARGOS system. The BSH is using Argo data to monitor water mass changes in the North Atlantic since they are changing inflow conditions for waters entering the North Sea. Main deployment areas will be the Atlantic and*

source regions in which deep water formation occurs in the polar areas. More information is available at <http://www.german-argo.de>

### **13. Marnet, BSH**

Kai Herklotz, [KAI.HERKLOTZ@BSH.DE](mailto:KAI.HERKLOTZ@BSH.DE)

Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

#### **ARGOS Programme Number 2120**

*The Marnet program consists of fixed monitoring stations in the North Sea and Baltic Sea which measure oceanic parameters as temperature, salinity, oxygen and currents in the water column. Waverider buoys are measuring sea state conditions, one of these is transmitting data through the ARGOS satellite system. Watchdog services are used for the other buoys. More information is available at <http://www.bsh.de/de/Meeresdaten/Beobachtungen/MARNET-Messnetz/index.jsp>*

### **14. IfM-Geomar: moored data buoys**

Jürgen Fischer, [JFISCHER@IFM-GEOMAR.DE](mailto:JFISCHER@IFM-GEOMAR.DE)

Leibniz-Institut für Meereswissenschaften, IFM-GEOMAR, Düsterbrookweg 20, 24105 Kiel, Germany

#### **ARGOS Programme Number 2736**

*The project uses Argos telemetry to transmit mooring data in near- real time to land. Every 2 hours, all instruments in the mooring receive an electronic signal via the mooring wire from the central controlling unit which is located inside the top flotation at the sea surface. The instruments then transmit all recorded data to the top float where the data are stored in the interim, and subsequently transmitted via satellite to the land station, and by email to the respective research institution. More information is available at <http://www.ifm-geomar.de/index.php?id=telemetrie>*

### **15. Iffezheimer Störche auf Reisen**

Herbert König, [KINGSCASTLE@T-ONLINE.DE](mailto:KINGSCASTLE@T-ONLINE.DE)

Initiativgruppe Naturschutz, Severin-Schäfer-Str. 3, 76473 Iffezheim

#### **ARGOS Programme Number 3100**

*The conservation initiative Iffezheim has ringed a storch in 2006 which hatched in Iffezheim. The Argos transmitter is used to study the migratory behaviour of this bird. More information is available at <http://www.iniffezheim.de/>*

### **16. European White-fronted Geese Research Project, European white-fronted goose (Blessgans)**

Helmut Kruckenberg, [HELMUT.KRUCKENBERG@BLESSGANS.de](mailto:HELMUT.KRUCKENBERG@BLESSGANS.de)

Europäisches Blessgans Forschungsprogramm, Am Steigbügel 3, D-27283 Verden (Aller), Germany

#### **ARGOS Programme Number 3189**

*The project studies the European White-fronted Goose (Anser albifrons)- its migration, behaviour, and ecology. The White-fronted Goose is the most numerous goose species wintering in Western Europe. By satellite tracking important new facts about migration behaviour and routes were found.*



*The project used microwave GPS transmitters for 36 birds and relays data via ARGOS, a special internet tool (live tracking) based on GoogleEarth was developed in 2006. More information is available at <http://www.blessgans.de>*

### **17. Montagu's Harrier**

Klaus-Michael Exo, [MICHAEL.EXO@IFV-VOGELWARTE.DE](mailto:MICHAEL.EXO@IFV-VOGELWARTE.DE)  
Institut für Vogelforschung, "Vogelwarte Helgoland", An der Vogelwarte 21, 26386 Wilhelmshaven, Germany

#### **ARGOS Programme Number 3338**

*The project studies the migration routes of Circus pygargus (Montagu's Harrier, Wiesenweihe) and the locations of their winter habitats in NW and NE- Europe. Circus pygargus is an endangered long distance migrant, breeding in northern Germany and wintering in Africa (Mauritania). A report can be downloaded at [http://www.fh-oow.de/ifv/downloads/96/wiesenweihe\\_dbu\\_abschlussbericht\\_ifv\\_jan\\_2009.pdf](http://www.fh-oow.de/ifv/downloads/96/wiesenweihe_dbu_abschlussbericht_ifv_jan_2009.pdf).*

### **18. Biota Maroc, Hamburg University**

Manfred Finckh, [MFINCKH@BOTANIK.UNI-HAMBURG.DE](mailto:MFINCKH@BOTANIK.UNI-HAMBURG.DE)  
Biozentrum Klein Flottbek, Systematik der Pflanzen, Ohnhorststr. 18, D-22609 Hamburg, Germany

#### **ARGOS Programme Number 3455**

*Biota Maroc is part of the BIOTA AFRICA project invented by African and German researchers aiming at the establishment of research supporting sustainable use and conservation of biodiversity in Africa. The project tracked movements of 3 nomadic herds in the Atlas mountain range using ARGOS and GPS transmitters. More information is available at <http://www.biota-africa.org/>*

### **19. ESA precursor, Tracking of individual birds**

Klaus-Michael Exo, [MICHAEL.EXO@IFV-VOGELWARTE.DE](mailto:MICHAEL.EXO@IFV-VOGELWARTE.DE)  
Institut für Vogelforschung, "Vogelwarte Helgoland", An der Vogelwarte 21, 26386 Wilhelmshaven, Germany

#### **ARGOS Programme Number 3490**

The project is carried out in the context of the ESA FlySafe activities. It analyses the technical prospects and limits in using satellite based bird tracking and monitors small scale and large scale movements. The work includes analyses of medium- and long-range bird migration behaviour as well as small scale feeding flights. A report is available at [http://www.fh-oow.de/ifv/downloads/96/esa\\_report\\_sovon\\_cover\\_2008-10.pdf](http://www.fh-oow.de/ifv/downloads/96/esa_report_sovon_cover_2008-10.pdf)

### **20. Transdrift-TR**

Guenther Heinemann, [HEINEMANN@UNI-TRIER.DE](mailto:HEINEMANN@UNI-TRIER.DE)  
Umweltmeteorologie, Universität Trier, Behringstraße 21 (Campus II), 54286 Trier, Germany

#### **ARGOS Programme Number 3635**

*The project uses data buoys to study the effects of polynjas in the Laptev sea for the system atmosphere-ocean-sea ice. More information is available at <http://www.uni-trier.de/index.php?id=15138&L=2#c21459>*

## 21. Hobby falcon

Bernd Meyburg, [BUMeyburg@aol.com](mailto:BUMeyburg@aol.com)

World working group on birds of prey and owls, Wangenheimstr. 32, D-14193 BERLIN, Germany.

### **ARGOS Programme Number 4126** (sub-PGM of PGM 1126)

*The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. More information is available at <http://www.raptors-international.de/index.htm>*

## 22. Argo Floats

Jürgen Fischer, [JFISCHER@IFM-GEOMAR.DE](mailto:JFISCHER@IFM-GEOMAR.DE)

Leibniz-Institut für Meereswissenschaften, IFM-GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany

### **ARGOS Programme Number 8165**

*The project studies the circulation and water mass anomalies in the tropics using autonomous profilers. The floats are part of the international ARGO programme. More information is available at <http://www.ifm-geomar.de/index.php?id=argo>*

## 23. Subsurface mooring monitoring

Gerd Rohardt, [Gerd.Rohardt@awi.de](mailto:Gerd.Rohardt@awi.de)

Alfred Wegener Institute, P.O.Box 120161, 27515 Bremerhaven, Germany

### **ARGOS Programme Number 8919** (sub-program 919)

*The aim of the project is to monitor moorings with Argos watchdogs. More information is available at [http://www.awi.de/de/forschung/fachbereiche/klimawissenschaften/messende\\_ozeanographie/instrumente/verankerungen/](http://www.awi.de/de/forschung/fachbereiche/klimawissenschaften/messende_ozeanographie/instrumente/verankerungen/)*

## 24. Norwave

Dieter Schrader, [Dieter.Schrader@BSH.de](mailto:Dieter.Schrader@BSH.de)

Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

### **ARGOS Programme Number 9948** (see 948)

*The Norwave measurements take place at fixed monitoring stations in the North Sea and Baltic Sea (see Marnet programme). Waverider buoys are measuring sea state conditions, one of these is transmitting data through the ARGOS satellite system. Watchdog services are used for the other buoys. <http://www.bsh.de/de/Meeresdaten/Beobachtungen/Seegang/index.jsp>*

## 25. Bulgaria

Bernd Meyburg, [BUMeyburg@aol.com](mailto:BUMeyburg@aol.com)

World working group on birds of prey and owls, Wangenheimstr. 32, D-14193 BERLIN, Germany.

### **ARGOS Programme Number 10126** (SS PGM 1126)

*The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. More information is available at <http://www.raptors-international.de/index.htm>*

## 26. Argo sub-surface

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Alfred Wegener Institute, P.O.Box 120161, 27515 Bremerhaven, Germany

### **ARGOS Programme Number 10919** (Sub-program of program 919 )

*The project studies variability and long-term changes in warm deep water in the Weddell Gyre. It also monitors convection events. The floats are equipped with special ice sensing technology to withstand the ice season during winter. The floats are part of the international ARGO programme. More information is available at [http://www.awi.de/en/research/research\\_divisions/climate\\_science/observational\\_oceanography/projects/wecon/](http://www.awi.de/en/research/research_divisions/climate_science/observational_oceanography/projects/wecon/)*

## 27. Red Kite

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### **ARGOS Programme Number 11126** (Sub-program of PGM 1126)

*The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. More information is available at <http://www.raptors-international.de/index.htm>*

## 28. Seismic ice flow drifter

Gerd Rohard, [Gerd.Rohardt@awi.de](mailto:Gerd.Rohardt@awi.de)

Alfred Wegener Institute, P.O.Box 120161, 27515 Bremerhaven, Germany

### **ARGOS Programme Number 12919** (sub-program of 919)

*The project uses Argos beacons to locate seismometers on ice floats during expeditions. More information is available at [http://www.awi.de/en/research/research\\_divisions/geosciences/geophysics/projects/seismology/seismology\\_ridges\\_move/agave2007/?0=](http://www.awi.de/en/research/research_divisions/geosciences/geophysics/projects/seismology/seismology_ridges_move/agave2007/?0=)*

## 29. Imperial eagle

Bernd Meyburg, [BUMeyburg@aol.com](mailto:BUMeyburg@aol.com)

World working group on birds of prey and owls, Wangenheimstr. 32, D-14193 BERLIN, Germany.

### **ARGOS Programme Number 21126** (sub-PGM OF PGM 1126)

*The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. More information is available at*

<http://www.raptors-international.de/index.htm>

## 30. Eagles

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### **ARGOS Programme Number 31136** (sub-PROGRAM OF PGM 1126)

*The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. More information is available at*

<http://www.raptors-international.de/index.htm>

## **Section 2. User Types by family (Table of PTT use by the country)**

	<b>Average active PTTs per month</b>	<b>Total PTT.Years</b>
<b>Buoys and others</b>	11	
<b>Profiling floats</b>	200	
<b>Animals</b>	hundreds	
<b>Fixed stations</b>	37	
<b>TOTAL</b>		

## **Section 3. Technological Changes that Affect User Requirements**

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

Programme 2 mentioned precision problems using ARGOS location in ice drift measurements. Temperature data were spiky. Is there a problem with interference from other transmitters?

Programme 16 mentioned the need for individual bills for each transmitter. The project costs are sponsored by private associations which would prefer to pay only for the transmitter for their respective animal.

Programme 18 mentioned precision problems using ARGOS locations. Mountain effects resulted in few and imprecise locations. The allocation of a single time slot for transmission was also problematic and the costs of transmission were high compared to the project budget.

The bird trackers in general mentioned higher accuracy needs in locations and needs for smaller and lighter transmitters.

**Section 5. Successful program use of ARGO (good news)**

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

The compilation of a list of users for each individual country helped a lot in compiling the national report.

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Year: 2009  
Country: Malaysia

**Section 1. Overall Summary**

*The Malaysian Meteorological Department does not use the Argos System.*

**Section 2. User Types by family (Table of PTT use by the country)**

	Average active PTTs per month	Total PTT.Years
Buoys and others		
Profiling floats		
Animals		
Fixed stations		
TOTAL		

**Section 3. Technological Changes that Affect User Requirements**

**Section 4. User issues, problems, and level of satisfaction with ARGOS**

**Section 5. Successful program use of ARGOS (good news)**

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

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**Year: 2009**

**Country: New Zealand**

### **Section 1. Overall Summary**

The New Zealand JTA Argos usage consists of one large programme (MetService Buoy programme), and 15 smaller programmes which cover a range of animal tracking applications and land conservation projects. The range and type of animal applications has grown in recent years with 7 types of birds, 2 types of fish and 4 types of mammals being tracked. A new application in the last year is the monitoring of crater lake levels on an active volcano.

### **Section 2. User Types by family (Table of PTT use by the country)**

The Table below shows New Zealand 2009 usage, but is incomplete because only 6 Users (of 16) provided input to this report.

	<b>Average active PTTs per month</b>	<b>Total PTT.Years</b>
<b>Buoys and others</b>	12	12
<b>Profiling floats</b>		
<b>Animals</b>	Some 22, (incomplete response)	Approx 1.3 (incomplete response)
<b>Fixed stations</b>		
<b>TOTAL</b>	?	?

### **Section 3. Technological Changes that Affect User Requirements**

One user (fish tracker) commented that the archival tags are collecting more data than can be uploaded to the satellite. The MetService Buoy programme will investigate the possible use of Iridium communications in the future. Early trials using Iridium indicate that buoy data is more timely and communications costs are lower. A move to using Iridium for all buoys would impact greatly on New Zealand Argos usage.

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

A high level of satisfaction with Argos was expressed in general by Users. One User commented that phantom transmissions were received even when his tags were switched off and stored in the fridge. A deer tracker was unsure if the data will be received promptly enough for their application. Another fish tracker said more satellites would enable more data to be collected to get a more complete data set. MetService reported that User Office support was excellent and the processing and QC of buoy data for GTS is highly reliable.

### **Section 5. Successful program use of ARGOS (good news)**

Users were keen to report on their success stories. The tracking of great white sharks in the Southwest Pacific has been successful. Many papers have been published on the successful tracking of sea lions. Adequate movement and some behavioural information has been received from New Zealand tagged striped marlin and broadbill swordfish. Juvenile northern royal albatross have been successfully tracked across the Southern Ocean and the coast of Chile for a full year, which is the first time that this age of species has been tracked for so long. Three years of location data for two falcons has also been a great success. The MetService buoy programme is an operationally excellent programme for which data is delivered 24/7.

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

Very good comments were received about the Argos User Office in Melbourne regarding setting up new accounts, amending accounts and general enquires. Users like the pay on consumption tariff, it is simpler for all and easier to understand and administer.

One user (Fish tracker) commented that *'New Zealand users pay more than elsewhere in the world'*.

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Year: 2009

Country: Republic of Korea

**Section 1. Overall Summary**

Three organization uses JTA Argos. The National Institute of Meteorological Research (NIMR) / Korea Meteorological Administration (KMA) will deploy 12 Argo floats to the East Sea and western Pacific. The Korea Ocean Research and Development Institute (KORDI) will deploy 5 Argo floats to the East Sea and Antarctic Sea. The Korea Hydrographic and Oceanographic Administration (KHOA) deployed 21 SVP drifters to the East Sea from September 2008 to August 2009.

**Section 2. User Types by family (Table of PTT use by the country)**

- NIMR / KMA

	Average active PTTs per month	Total PTT.Years
<b>Buoys and others</b>		
<b>Profiling floats</b>		2.6
<b>Animals</b>		
<b>Fixed stations</b>		
<b>TOTAL</b>		<b>2.6</b>

- KORDI

	Average active PTTs per month	Total PTT.Years
<b>Buoys and others</b>		
<b>Profiling floats</b>		3.0
<b>Animals</b>		
<b>Fixed stations</b>		
<b>TOTAL</b>		<b>3.0</b>

- KHOA

	Average active PTTs per month	Total PTT.Years
<b>Buoys and others</b>		0.5
<b>Profiling floats</b>		
<b>Animals</b>		
<b>Fixed stations</b>		
<b>TOTAL</b>		<b>0.5</b>

**Section 3. Technological Changes that Affect User Requirements****Section 4. User issues, problems, and level of satisfaction with ARGOS****Section 5. Successful program use of ARGOS****Section 6. Analysis of Local Operational Issues**


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**Year: 2009**

**Country: Russian Federation**

### **Section 1. Overall Summary**

In 2009, Russian scientists have developed ARGOS based programs intensively.

Programs are mainly in the frame of wildlife: animals and birds : tigers, leopards, onces, bears, belougas, seals and Siberian geese. Such programs already in place should be pursued in 2010. New programs are planned on wolfs, whales, "morses", "oies", "mouettes".

Taking into account such progress, some development work is ongoing on new transmitters produced in Russia : ARGOS based and ARGOS+GPS based.

Russian prototypes have been tested successfully on belougas and seals tracking.

Currently first russian collars are under development for bears. Plans exist to develop very small transmitters for birds tracking (a few centimeters).

The ARGOS system is also used in Russia for Russian waters monitoring. Some projects have been conducted related to currents monitoring, sea ice and iceberg drift monitoring in Barentz Sea and Okhotsk sea. Such studies are performed using ARGOS/GPS Ukrainian beacons.

In 2010, several environmental monitoring programs are planned based on fixed stations : seismic and volcanoes monitoring, sub surface water monitoring along gaz pipelines : etc.

### **Section 2. User Types by family (Table of PTT use by the country)**

	<b>Average active PTTs per month</b>	<b>Total PTT.Years</b>
<b>Buoys and others</b>	5 - 40	50
<b>Profiling floats</b>	0	0
<b>Animals</b>	10 - 12	15
<b>Fixed stations</b>	0	0
<b>TOTAL</b>	<b>15 -50</b>	<b>65</b>

### **Section 3. Technological Changes that Affect User Requirements**

Foreign equipment remain much too expensive for Russian users as long as administrative procedures and import conditions are so complicated. That's has driven Russian scientists to develop their own equipment for marine mammals tracking at first. Their characteristics being: easy of exploitation, robustness and reliability, low cost.

Today, Russian ARGOS/GPS collars are nearly developed for bears. They have been developed to face bad resultants obtained with US collars, not working in Russian conditions, very dense forests and unfavorable landscape in extreme east. Russian collars use strong power emission and automatic error bit correction inside the collar.

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

En 2008, 2009 major problems have been encountered on tiger collars in Extreme East both wildlife and Telonics collars because of the density of vegetation in forests and sharp landscape. Satellite transmissions with low power do not pass through the forest with only a few episodic positions transmitted.

**Section 5. Successful program use of ARGOS**

When considering the significant size of the Russian territory both land and sea, numerous ecological and scientific issues cannot be studied and resolved without space based solutions. Polar orbiting satellites are particularly efficient especially in northern Russian regions.

Being polar orbiting, Argos satellite systems allow the successful development of really complex programs. For example, in 2009, in Barents Sea, sea ice and icebergs have been performed reaching very precise location, around 10m, with a repeating period of 15 mn).

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Year: 2009

Country: South Africa

**Section 1. Overall Summary**

The Argos Service is used to transmit marine meteorological data from the drifting and fixed weather buoy network via the Argos Satellite system to data processing centres and onward to the Global Telecommunication System (GTS) for use in operational forecasting, and other services.

**Section 2. User Types by family (Table of PTT use by the country)**

	Average active PTTs per month	Total PTT.Years
Buoys and others	3	2.85
Profiling floats		
Animals		
Fixed stations	2	2
<b>TOTAL</b>	<b>5</b>	<b>4.85</b>

**Section 3. Technological Changes that Affect User Requirements**

Due to financial challenges the SAWS can not order LUT's and is requesting assistance from external bodies.

**Section 4. User issues, problems, and level of satisfaction with ARGOS**

X

**Section 5. Successful program use of ARGO (good news)**

X

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

Data transmission in the South Atlantic is problematic because of limited satellite coverage in the Southern Hemisphere in general. It is hoped that the proposed installation of AHRPT stations in the sub-Antarctic islands will improve this.

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**Year: 2009**

**Country: Sweden (status for ARGOS program of Thomas Alerstam, Lund University)**

### **Section 1. Overall Summary**

Studies of bird migration and orientation

### **Section 2. User Types by family (Table of PTT use by the country)**

	<b>Average active PTTs per month</b>	<b>Total PTT.Years</b>
<b>Buoys and others</b>		
<b>Profiling floats</b>		
<b>Animals</b>	14	2
<b>Fixed stations</b>		
<b>TOTAL</b>		

PTTs are used for tracking migrating birds and analysing their migratory behaviour and orientation/navigation. Presently mainly raptors like osprey (6 active PTTs) and marsh harrier (6 active PTTs) migrating between Sweden and West Africa are tracked by but also Wood pigeons (2 active PTTs) migrating within Europe. A slightly expanded tracking program with more species involved are planned for the coming years.

### **Section 3. Technological Changes that Affect User Requirements**

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

Thomas Alerstam is satisfied with the support Argos is giving to the research program.

### **Section 5. Successful program use of ARGO (good news)**

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

**Year:** 2009

**Country:** Sweden (status for ARGOS program of Susanne Åkesson, Lund University)

### **Section 1. Overall Summary**

Tracking migration of sea turtles and sea birds

### **Section 2. User Types by family (Table of PTT use by the country)**

	<b>Average active PTTs per month</b>	<b>Total PTT.Years</b>
<b>Buoys and others</b>		
<b>Profiling floats</b>		
<b>Animals</b>	4	0.70
<b>Fixed stations</b>		
<b>TOTAL</b>		

### **Section 3. Technological Changes that Affect User Requirements**

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

Susanne Åkesson is satisfied with the support ARGOS is giving to the research program.

### **Section 5. Successful program use of ARGO (good news)**

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

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**Year:** 2009  
**Country:** The Netherlands (NIOZ)

### **Section 1. Overall Summary**

**Royal Netherlands Institute for Sea Research (NIOZ)**  
 PROCS (1996)

The mission of NIOZ is to gain and communicate scientific knowledge on seas and oceans, among others through scientific projects, for the understanding and sustainability of our planet. Subsurface Mooring Monitoring ARGOS beacons are used to monitor the presence of its moorings and landers. Moorings and landers are being deployed as part of scientific projects, carried out by NIOZ in the North Sea, the Atlantic Ocean, the Mediterranean Sea and the Indian Ocean.

### **Section 2. User Types by family (Table of PTT use by the country)**

	<b>Average active PTTs per month</b>	<b>Total PTT.Years</b>
<b>Buoys and others</b>	22	0.01
<b>Profiling floats</b>		
<b>Animals</b>		
<b>Fixed stations</b>		
<b>TOTAL</b>	<b>22</b>	<b>0.01</b>

### **Section 3. Technological Changes that Affect User Requirements**

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

ARGOS PTTs are used to alarm NIOZ that a mooring or lander has come to the surface, which should not happen for a very long time. This means that ARGOS PTTs are not supposed to transmit until a mooring or lander is no longer subsurface. This is an unusual application of the ARGOS System!

#### **Section 5. Successful program use of ARGOS (good news)**

Efficient operation of User Office.

Safe idea that ARGOS PTTs can be used for subsurface beacons coming at the surface.

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

No data collection, only location.

**Year:** 2009  
**Country:** The Netherlands (KNMI)

**Section 1. Overall Summary**

**Royal Netherlands Meteorological Institute, Scientific Department**  
 Dutch Argo (2936)  
 Contribution to the ARGO programme.

**Section 2. User Types by family (Table of PTT use by the country)**

	Average active PTTs per month	Total PTT.Years
Buoys and others		
Profiling floats	25	1
Animals		
Fixed stations		
<b>TOTAL</b>		

**Section 3. Technological Changes that Affect User Requirements**

*n/a*

**Section 4. User issues, problems, and level of satisfaction with ARGOS**

highly satisfied – no problems

**Section 5. Successful program use of ARGO (good news)**

*n/a*

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

*n/a*

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**ANNEX XI**

**LIST OF REPRESENTATIVES OF COUNTRY (ROCS) FOR ARGOS**

**AUSTRALIA**

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**ANNEX XII****LIST OF ACRONYMS AND OTHER ABBREVIATIONS**

ADS	Automatic Distribution System (Argos)
AHRPT	Advanced High Rate Picture Transmission
BUFR	Binary Universal Form for Representation of Meteorological Data
BUOY	Report for Buoy Observations
CDA	Command Data Acquisition
CLS	Collecte Localisation Satellites
CNES	Centre National d`Etudes spatiales (France)
DBCP	Data Buoy Cooperation Panel (WMO-IOC)
EC	JTA Executive Committee
E-SURFMAR	Surface Marine programme of the Network of European Meteorological Services, EUMETNET
EUMETNET	Network of European Meteorological Services
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
ESPC	NOAA Environmental Satellite Processing Centre (USA)
FRGPC	French Argos Global Processing Centre
FYP	Five-Year Plan (of JTA)
GAC	Global Area Coverage
GDP	Global Drifter Programme
GIS	Geographic Information System
GTS	Global Telecommunication System (WMO)
HRPT	High Rate Picture Transmission
IABP	International Arctic Buoy Programme
IBPIO	International Buoy Programme for the Indian Ocean
ID	Platform Identification Number
IJPS	Initial Joint Polar-Orbiting Operational Satellite System (NOAA, EUMETSAT)
IMB	Ice Mass Buoy
INCOIS	Indian National Centre for Ocean Information Services
INPE	Instituto Nacional de Pesquisas Espaciais (Brazil)
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IRD	Institut français de recherche scientifique pour le développement en coopération (formerly ORSTOM)
ISABP	International South Atlantic Buoy Programme
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM <i>in situ</i> Observing Platform Support Centre
Jrev	permanent JTA review mechanism
JTA	Argos Joint Tariff Agreement
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)
NORI	National Oceanographic Research Institute (Korea)
NPDBAP	North Pacific Data Buoy Advisory Panel
NPOESS	National Polar-orbiting Operational Environmental Satellite System (USA)
NWP	Numerical Weather Prediction
OCO	NOAA Office of Climate Observation (USA)
OPSCOM	Argos Operations Committee (NOAA, CNES, EUMETSAT)
PDF	Adobe Portable Document Format
PMT	Platform Messaging Transceivers

POES	Polar-orbiting Operational Environmental Satellite
PTT	Platform Transmitter Terminal (JTA)
PTT.year	Equivalent to a PTT reporting every day during one year
QC	Quality Control
RO	Responsible Organization representing an agreed set of Argos User programs (JTA)
ROC	Representative of Country representing a country or a group of countries participating in the JTA
RUG	Representative of a User Group
SAI	Service Argos, Inc. (USA, now CLS America)
SAWS	South African Weather Service
SCD	Satélite de Coleta de Dados (Data Collection Satellite, Brazil)
SOOP	Ship-of-Opportunity Programme
SOOPIP	JCOMM Ship-of-Opportunity Programme Implementation Panel
SOT	Ship Observations Team (JCOMM)
SSA3	Argos 3 Ground Segment project
SST	Sea Surface Temperature
SUA	Argos System Use Agreement
TAO	Tropical Atmosphere Ocean Array
TIP	TAO Implementation Panel
UNESCO	United Nations Educational, Scientific and Cultural Organization
USD	US Dollar
VOS	Voluntary Observing Ship
WMO	World Meteorological Organization

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